来选择所述第一高度或选择所述多个可成型层中的对应于所述第一高度的数个可成型层。

[0108] 在一些实施例中，选择所述第一高度或选择所述多个可成型层中的对应于所述第一高度的数个可成型层中的至少一者进一步包括相对于对象高度精度误差来对高度配置参数精度误差加权。

[0109] 在一些实施例中，选择所述第一高度或选择所述多个可成型层中的对应于所述第一高度的数个可成型层中的至少一者被偏向正高度配置参数精度误差。

[0110] 在一些实施例中，该方法进一步包括与第一高度分开地选择底部可成型层高度以确保底层粘合。

[0111] 在一些实施例中，一种其上存储有指令的计算机可读存储介质，所述指令在由至少一个处理器执行时使所述至少一个处理器执行用于在生成包括多个可成型层的三维(3D)对象时改进尺寸精度的操作，所述操作包括：

[0112] 接收至少一个高度配置参数和总对象高度；

[0113] 基于接收到的至少一个高度配置参数和所述总对象高度来选择与所述多个可成型层相对应的第一高度，其中所述第一高度被选择成优化所述至少一个高度配置参数或所述总对象高度中的至少一者的精度；以及

[0114] 将所述第一高度传达给3D打印机以生成所述3D对象。

[0115] 在一些实施例中，所述至少一个高度配置参数包括3D打印机分辨率选择或层高。

[0116] 在一些实施例中，所述至少一个高度配置参数包括与所述多个可成型层的子集相对应的容限。

[0117] 在一些实施例中，基于接收到的至少一个高度配置参数和所述总对象高度来选择与所述多个可成型层的至少所述子集相对应的第二高度，其中所述第二高度被选择成优化所述至少一个高度配置参数和所述总对象高度中的至少一者的精度。

[0118] 上述3D对象层高选择技术和/或切片程序/驱动程序165以及任何相关联的用户界面可被实现在一个或多个计算设备或环境上，如下所述。图10描绘了其中可以体现本文描述的一些技术的示例通用计算环境，例如可包括计算设备110。计算系统环境1002只是合适的计算环境的一个示例，并且不旨在对当前公开的主题的使用范围或功能提出任何限制。也不应该将计算环境1002解释为对示例操作环境1002中示出的任一组件或其组合有任何依赖性或要求。在一些实施例中，所描绘的各种计算元素可包括被配置成实例化本发明的各具体方面的电路。例如，本公开中使用的术语电路可包括被配置成通过固件或开关来执行(诸)功能的专用硬件组件。其他示例实施例中，术语电路可包括由实施可用于执行(诸)功能的逻辑的软件指令配置的通用处理单元、存储器等。在电路包括硬件和软件的组合的示例实施例中，实施者可以编写体现逻辑的源代码，且源代码可以被编译为可以由通用处理单元处理的机器可读代码。因为本领域技术人员可以明白现有技术已经进化到硬件、软件或硬件/软件组合之间几乎没有差别的地步，因而选择硬件或是软件来实行具体功能是留给实现者的设计选择。更具体地，本领域技术人员可以明白软件进程可被变换成等价的硬件结构，而硬件结构本身可被变换成等价的软件进程。由此，对于硬件实现还是软件实现的选择是设计选择之一并留给实现者。

[0119] 可包括移动设备或智能电话、平板、膝上型设备、台式计算机、或联网设备的集合、云计算资源等中的任一者的计算机1002通常包括各种计算机可读介质。计算机可读介质可

以是能由计算机1002访问的任何可用介质，而且包含易失性和非易失性介质、可移动和不可移动介质。系统存储器1022包括易失性和/或非易失性存储器形式的计算机可读存储介质，诸如只读存储器(ROM)1023和随机存取存储器(RAM)1060。包含诸如在启动期间帮助在计算机1002内的元件之间转移信息的基本例程的基本输入/输出系统1024(BIOS)通常存储在ROM 1023中。RAM 1060通常包含处理单元1059可立即访问和/或当前正在操作的数据和/或程序模块。作为示例而非限制，图10示出了操作系统1025、应用程序1026、其他程序模块1027(包括3D层高优化器1065)和程序数据1028。

[0120] 计算机1002也可以包括其他可移动/不可移动、易失性/非易失性计算机存储介质。仅作为示例，图10示出了从不可移动、非易失性磁介质中读取或向其写入的硬盘驱动器1038，从可移动、非易失性磁盘1054中读取或向其写入的磁盘驱动器1039，以及从诸如CD ROM或其他光学介质等可移动、非易失性光盘1053中读取或向其写入的光盘驱动器1004。可以在该示例操作环境中使用的其它可移动/不可移动、易失性/非易失性计算机存储介质包括但不限于，磁带盒、闪存卡、数字多功能盘、数字录像带、固态RAM、固态ROM等等。硬盘驱动器1038通常通过诸如接口1034之类的不可移除存储器接口连接至系统总线1021，而磁盘驱动器1039和光盘驱动器1004通常由诸如接口1035或1036之类的可移除存储器接口连接至系统总线1021。

[0121] 以上讨论并在图10中示出的驱动器及其相关联的计算机存储介质为计算机1002提供了对计算机可读指令、数据结构、程序模块和其他数据的存储。在图10中，例如，硬盘驱动器1038被示为存储操作系统1058、应用程序1057、其他程序模块1056和程序数据1055。注意，这些组件可与操作系统1025、应用程序1026、其他程序模块1027和程序数据1028相同，也可与它们不同。在此操作系统1058、应用程序1057、其他程序模块1056以及程序数据1055被给予了不同的编号，以至少说明它们是不同的副本。用户可以通过输入设备，诸如键盘1051和定点设备1052(通常称为鼠标、跟踪球或触摸垫)向计算机1002输入命令和信息。其他输入设备(未示出)可包括话筒、操纵杆、游戏手柄、圆盘式卫星天线、扫描仪、视网膜扫描仪等。这些及其他输入设备常常通过耦合到系统总线1021的用户输入接口1036连接到处理单元1059，但是，也可以通过其他接口和总线结构，如并行端口、游戏端口、通用串行总线(USB)端口来进行连接。监视器1042或其他类型的显示设备也经由诸如视频接口1032之类的接口连接至系统总线1021。除监视器之外，计算机还可包括可以通过输出外围接口1033连接的诸如扬声器1044和打印机1043(诸如3D打印机105)之类的其他外围输出设备。

[0122] 计算机1002可使用到一个或多个远程计算机(诸如，远程计算机1046)的逻辑连接而在联网环境中操作。远程计算机1046可以是个人计算机、服务器、路由器、网络PC、对等设备或其他常见网络节点，并且通常包括许多或所有以上相对计算机1002所描述的元件，但在图10中仅示出了存储器存储设备1047。图10中所描绘的逻辑连接包括局域网(LAN)1045和广域网(WAN)1049，但还可包括其他网络。这样的联网环境常见于办公室、企业范围计算机网络、内联网、互联网和云计算资源中。

[0123] 当在LAN联网环境中使用时，计算机1002通过网络接口或适配器1037连接到LAN 1045。当在WAN联网环境中使用时，计算机1002通常包括调制解调器1005或用于通过诸如因特网等WAN 1049建立通信的其他手段。调制解调器1005可以是内置的或外置的，可经由用户输入接口1036或其他适当的机制连接到系统总线1021。在联网环境中，相关于计算机

1002所示的程序模块或其部分可被储存在远程存储器存储设备中。作为示例而非限制，图10示出了远程应用程序1048驻留在存储器设备1047上。应当理解，所示的网络连接是示例性的，并且可使用在计算机之间建立通信链路的其他手段。

[0124] 在一些方面，其他程序1027可包括包含上述功能性(诸如3D打印机切片程序或驱动程序165中的功能性或与其相关联的功能性)的3D层高优化器应用1065。在一些情形中，3D层高优化器应用1065/切片程序165可以执行过程400、500、600和/或800中的一些或全部操作，并且如上所述通过图形接口1031、视频接口1032、输出外围接口1033和/或一个或多个监视器或触摸屏设备1042来提供用户界面。在一些方面，3D层高优化器应用1065/切片程序165可以与3D打印机105通信以产生3D图像数据的物理3D物体，如上所述。在一些方面，其他程序1027可包括一个或多个3D虚拟化应用，该应用可获取并提供可被显示的由3D层高优化器应用1065/切片程序165生成的经切片3D模型的图像。

[0125] 以上章节中描述的过程、方法以及算法中的每一个可被全部或部分自动地实例化在由一个或多个计算机或计算机处理器执行的代码模块中。代码模块可被存储在任意类型的非瞬态计算机可读介质或计算机存储设备上，诸如硬盘、固态存储器、和/或光盘等。过程和算法可被部分或全部地以专用电路来实现。所公开的过程和过程步骤的结果可被持久地或以其它方式存储在任意类型的非瞬态计算机存储中，诸如举例而言易失性或非易失性存储。以上所描述的各特征和过程可被彼此独立地私钥，或以各种方式被组合。所有可能的组合和子组合被预期落在本公开的范围内。另外，在一些实现中，某些方法或过程块可被省略。本文描述的方法和过程也不被限于任何特定的顺序，并且各个块以及与其有关的状态可以适当的其它顺序来执行。例如，所描述的块或状态可以不同于具体公开的顺序来执行，或者多个块或状态可被组合成单个的块或状态。示例块或状态可被顺序地、并行地或以其它形式来执行。块或状态可相对于所公开的示例实施例被添加或移除。本文描述的示例系统和组件可被与所描述地不同地配置。例如，相对于所公开的示例实施例，各元素可被添加、移除或重新排列。

[0126] 还将理解，各个项被例示为在被使用是被存储在存储器或存储中，并且存储器管理和数据完整性的目的，这些项目或其部分可在存储器和其它存储设备之间转移。替代地，在其它实施例中，软件模块和/或系统的一些或全部可在另一设备上的存储器中执行并且经由跨计算机通信与所例示的计算系统通信。此外，在一些实施例中，系统和/或模块的一些或全部可以其它方式被实现或提供，诸如至少部分地以固件和/或硬件的形式，硬件包括但不限于专用集成电路(ASIC)、标准集成电路、控制器(例如，通过执行恰当的指令、并且包括微控制器和/或嵌入式控制器)、现场可编程门阵列(FPGA)、复杂可编程逻辑器件(CPLD)等。模块、系统和数据结构中的一些或全部还可被存储(例如作为软件指令或结构化数据)在计算机可读介质上，诸如硬盘、存储器、网络或便携式介质产品以供恰当的驱动器或经由恰当的连接来读取。出于本说明书和权利要求书的目的，短语“计算机可读存储介质”及其变型不包括波、信号和/或其他瞬态和/或无形通信介质。系统、模块和数据结构还可被作为各种各样的计算机可读传输介质上的生成的数据信号(例如，作为载波或其它模拟或数字传播信号的一部分)来传送，计算机可读传输介质包括基于无线和基于有线/线缆的介质，并且可采用各种形式(例如，作为单个或复用的模拟信号的一部分，或者作为多个离散数字分组或帧)。在其它实施例中，这类计算机程序产品还可采用其它形式。因此，本公开可以其

它计算机系统配置来实现。

[0127] 除非另外具体声明，否则在如所使用的上下文中可以理解的，本文使用的条件语言（诸如“能”、“能够”、“可能”或“可以”）一般意图表达特定实施例包括而其他实施例不包括特定特征、元素和/或步骤。因此，这样的条件语言一般并非旨在暗示对于一个或多个实施例需要特征、元素和/或步骤，或者一个或多个实施例必然包括用于决定的逻辑、具有或不具有用户输入或提示、在任何特定实施例中是否要包括或要执行这些特征、元素和/或步骤。术语“包括”、“包含”、“具有”等是同义词并且被以开放形式包括性使用，而不排除其它元素、特征、动作、操作等等。此外，术语“或”被以其包括含义来使用（而不是以其排除含义），使得当被使用时，例如用于连接一列元素时，术语“或”表示该列表中的元素中的一个、一些或全部。

[0128] 虽然某些示例实施例已被描述，但是这些实施例是仅作为示例来提供的，而不旨在限制本文公开的发明的范围。因此，前述描述中没有任何旨在暗示任何特定的特征、特性、步骤、模块或块是必需或不可替代的。事实上，本文描述的新的方法和系统可以各种其它形式来实现；此外，本文描述的方法和系统的形式上的各种省略、替换和改变可在不背离本文公开的发明的精神的情况下进行。随附的权利要求及其等同体旨在覆盖这类形式或修改，如将会落在本文公开的发明的某些的范围和精神内的。

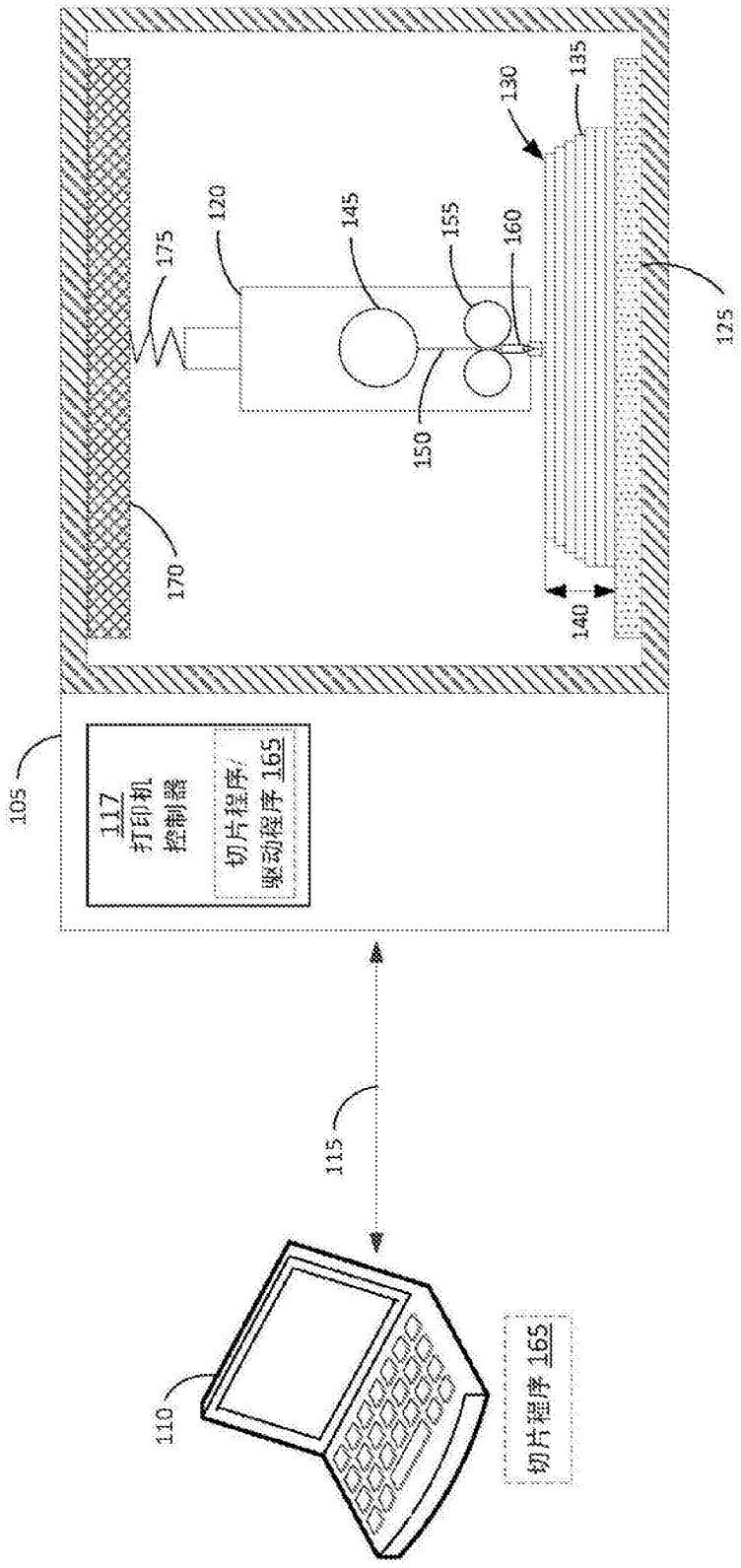

图1

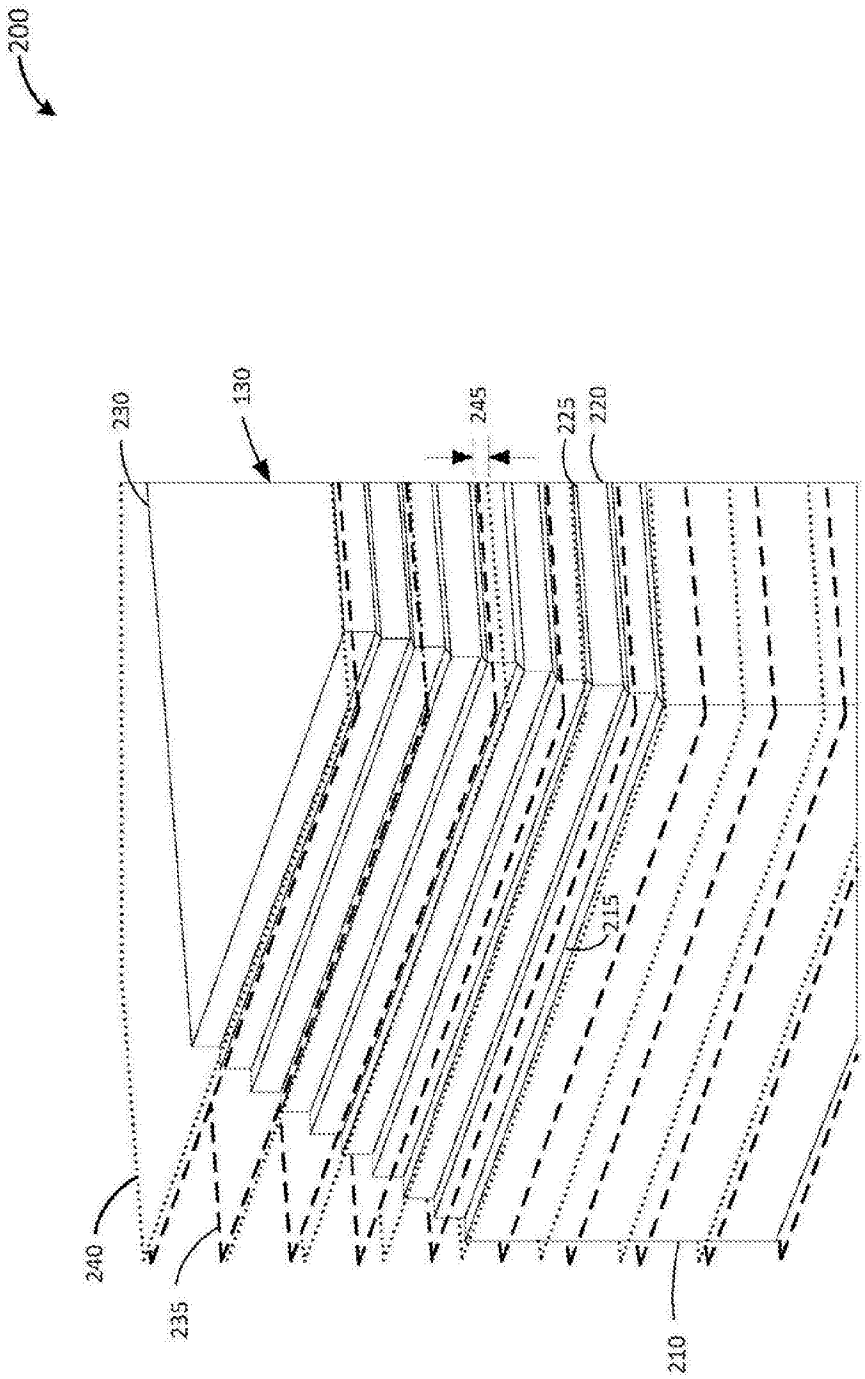

图2

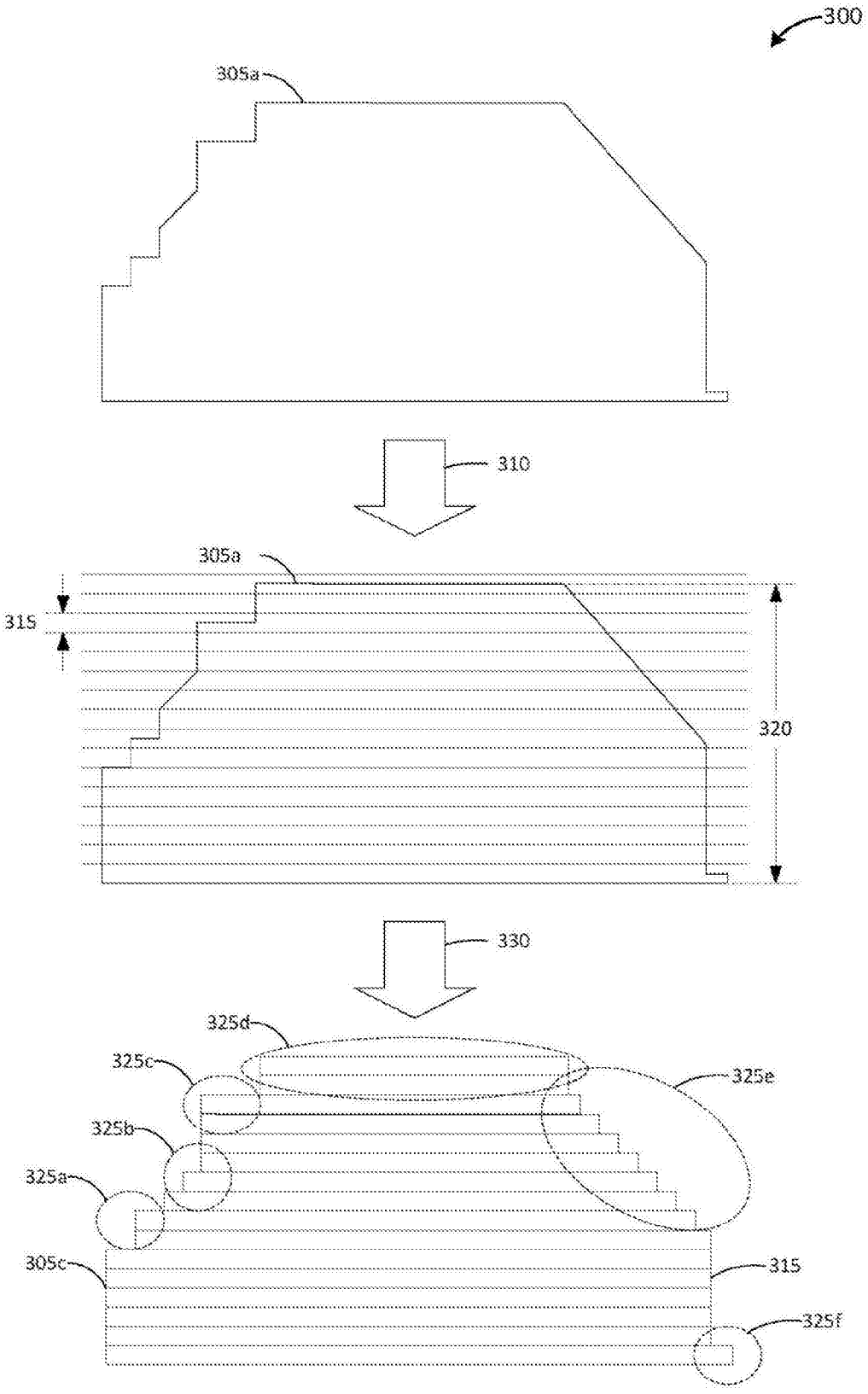

图3

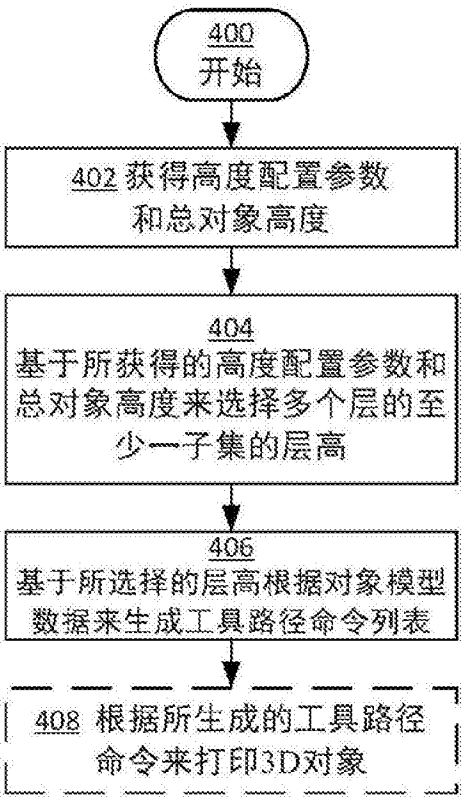

图4

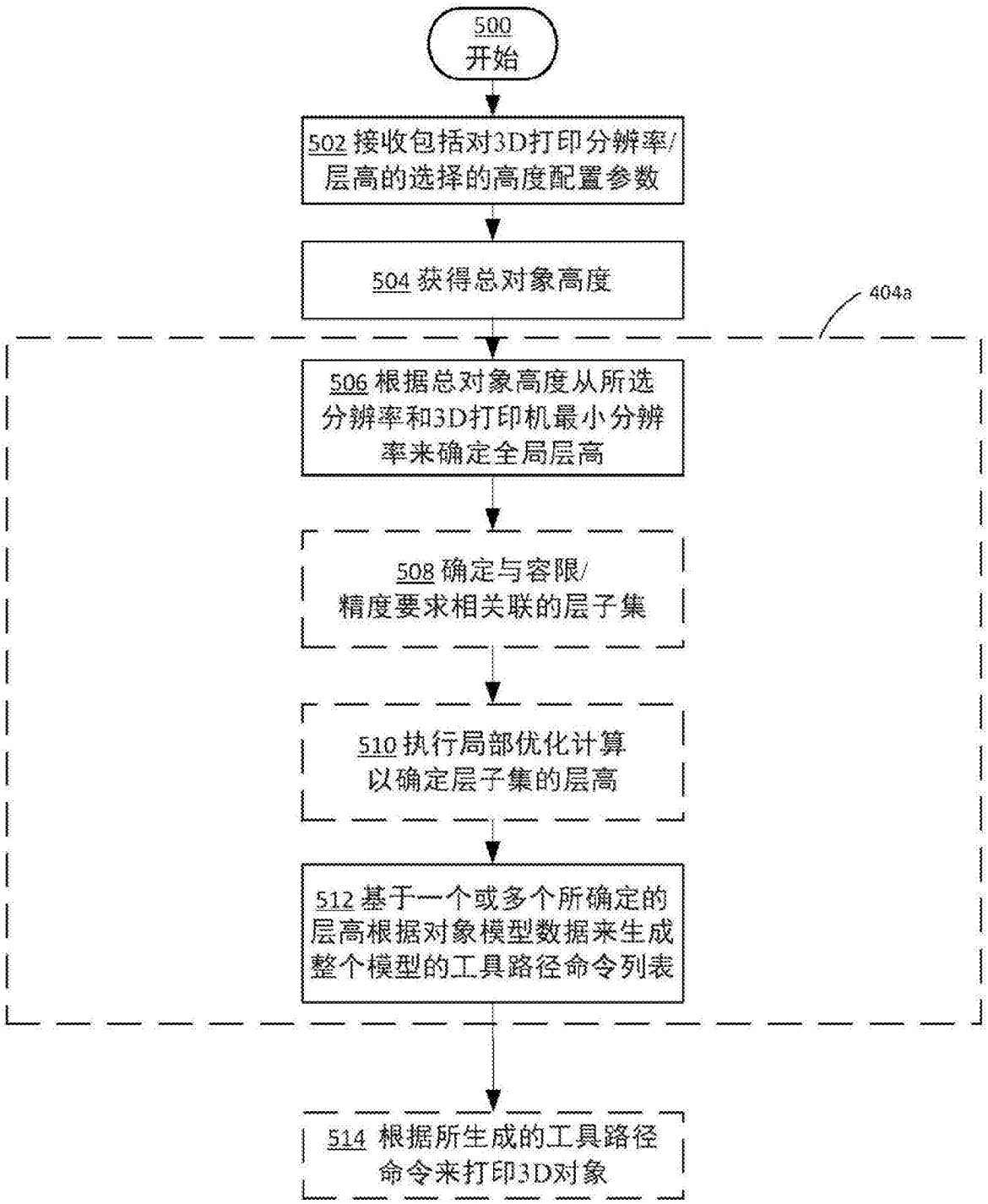

图5

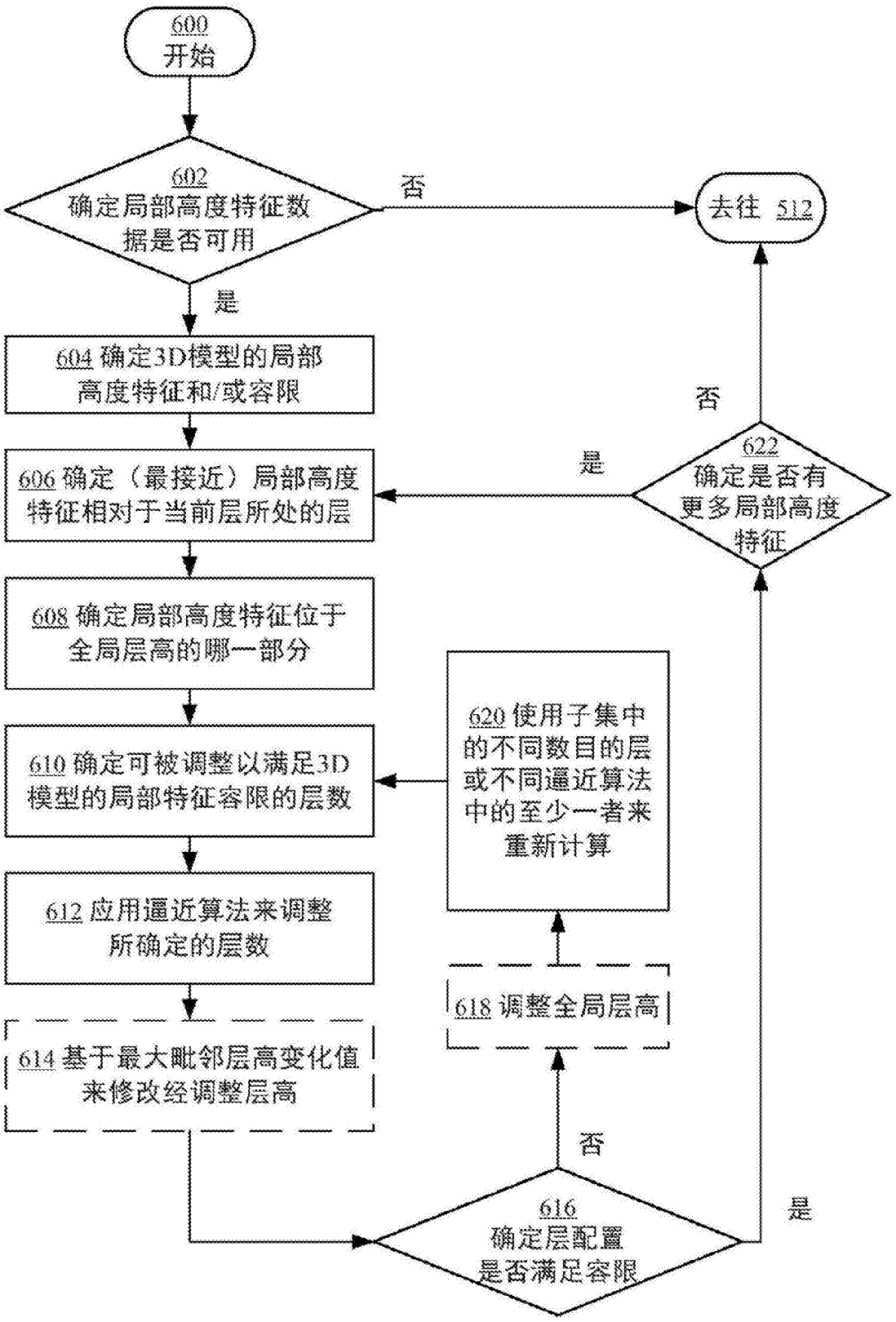

图6

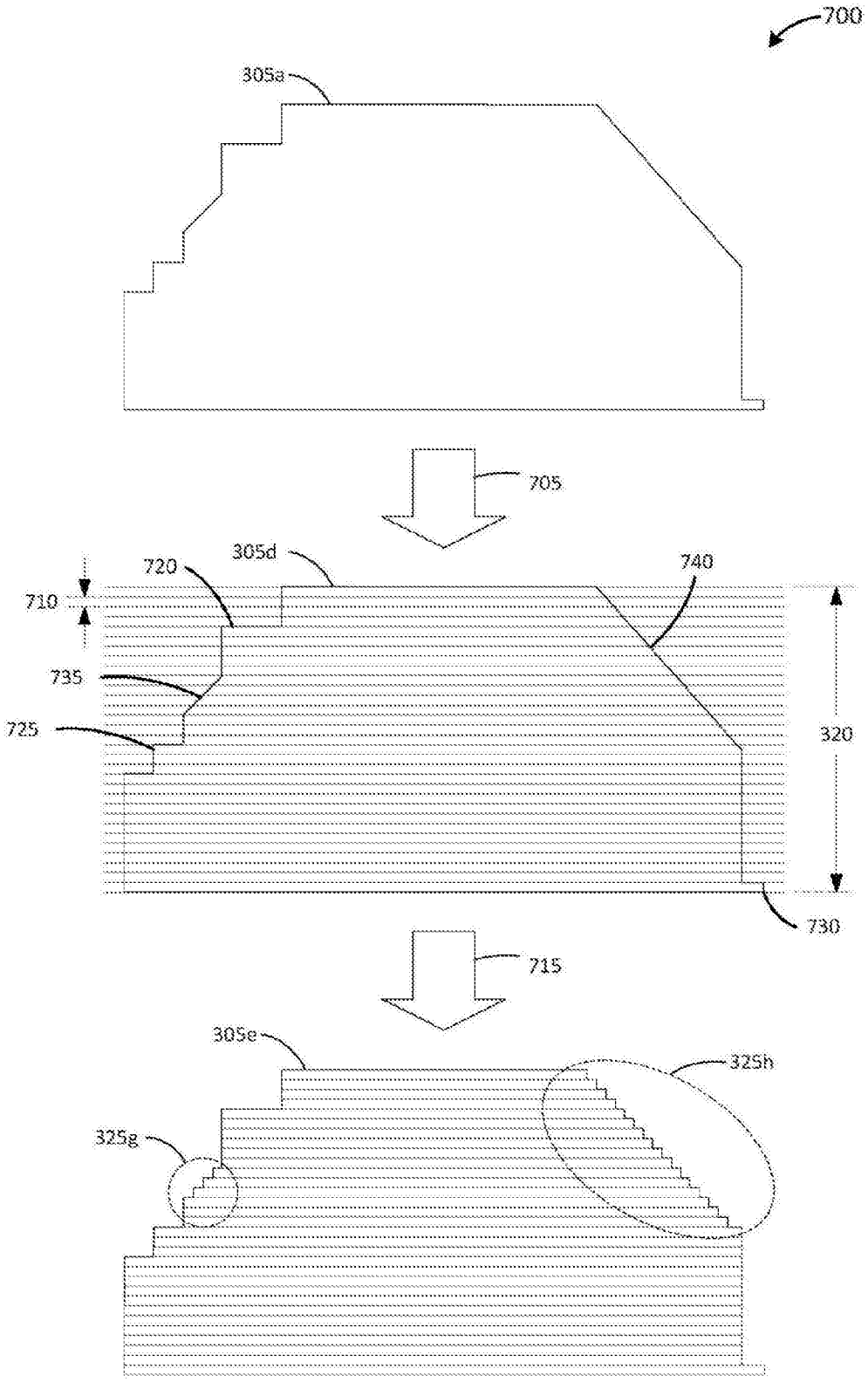

图7

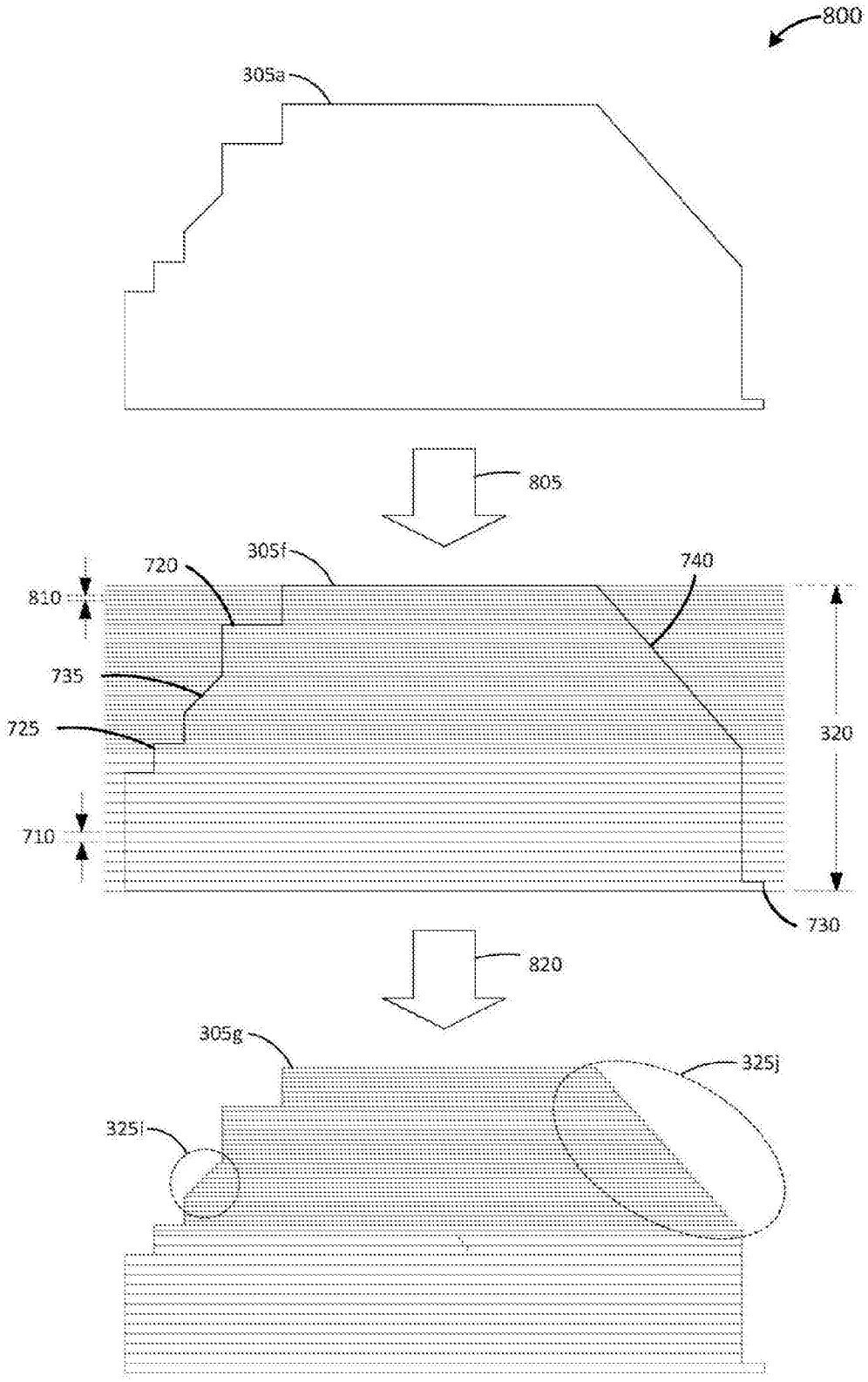

图8

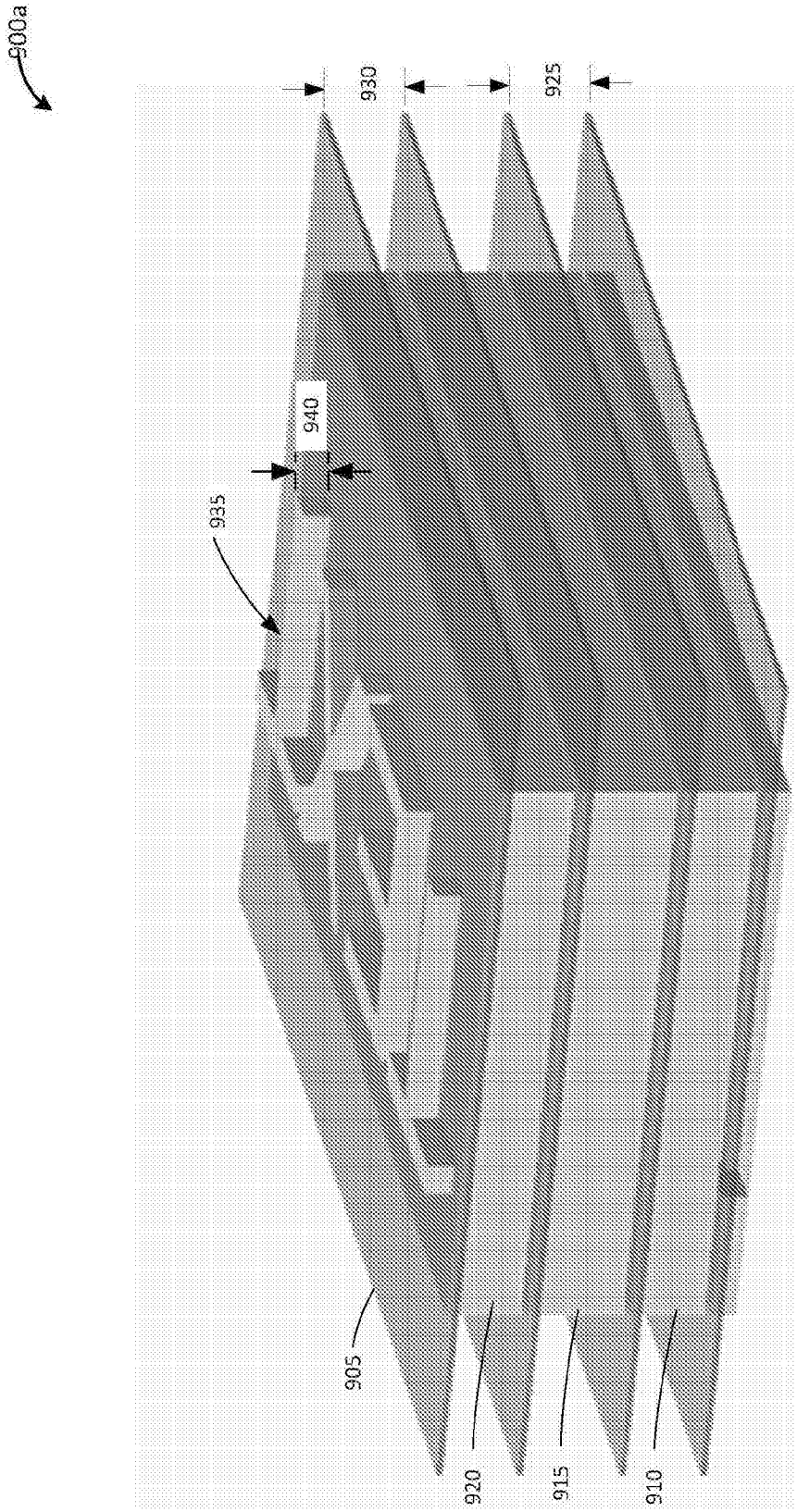

图9A

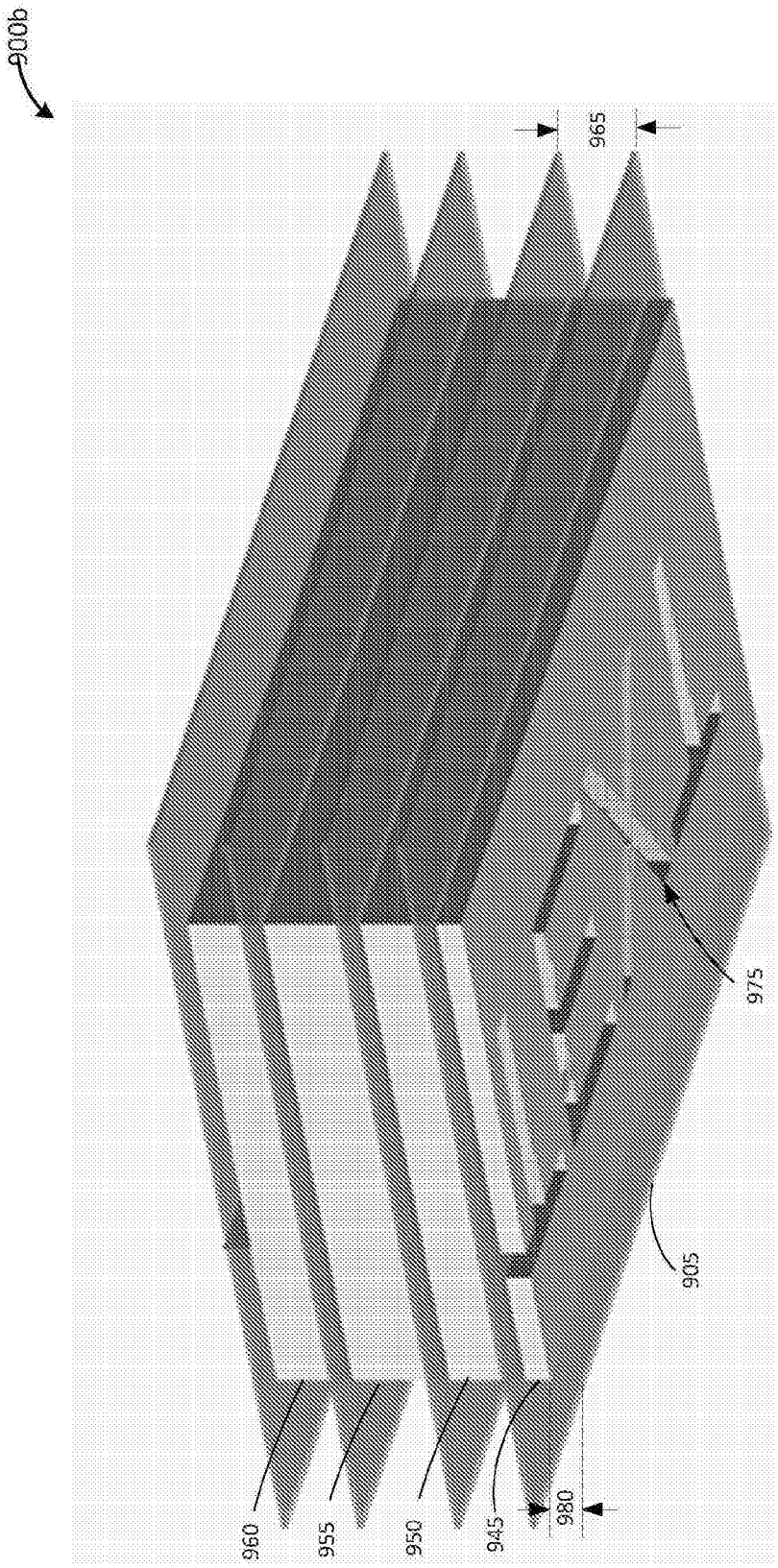

图9B

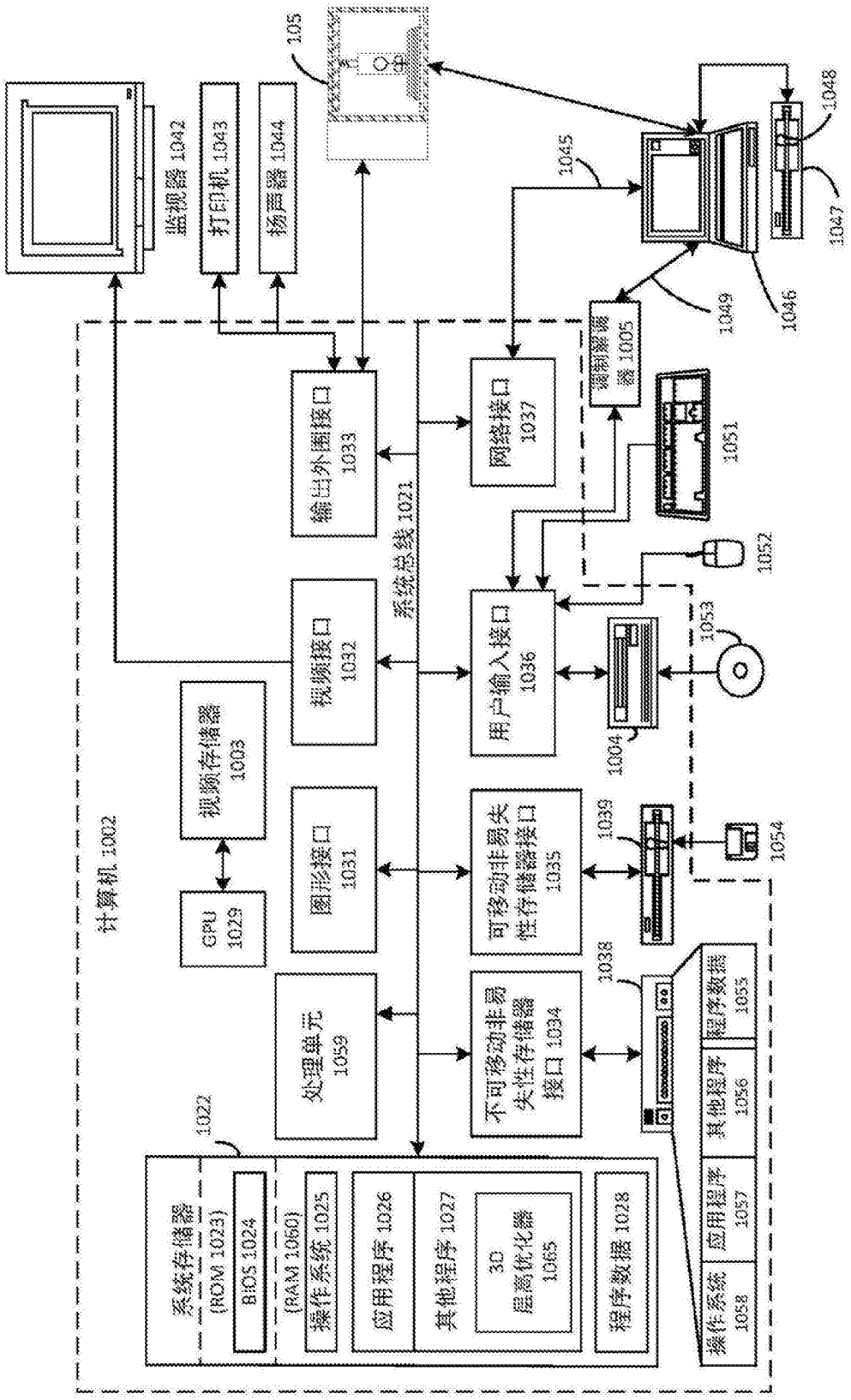

图10

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TITLE OF INVENTION: Method and System for Asynchronous Mobile Payments for Multiple In-Person Transactions Conducted in Parallel

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	03/07/2024

THE APPLICATION IDENTIFIED ABOVE HAS BEEN EXAMINED AND IS ALLOWED FOR ISSUANCE AS A PATENT. PROSECUTION ON THE MERITS IS CLOSED. THIS NOTICE OF ALLOWANCE IS NOT A GRANT OF PATENT RIGHTS. THIS APPLICATION IS SUBJECT TO WITHDRAWAL FROM ISSUE AT THE INITIATIVE OF THE OFFICE OR UPON PETITION BY THE APPLICANT. SEE 37 CFR 1.313 AND MPEP 1308.

THE ISSUE FEE AND PUBLICATION FEE (IF REQUIRED) MUST BE PAID WITHIN THREE MONTHS FROM THE MAILING DATE OF THIS NOTICE OR THIS APPLICATION SHALL BE REGARDED AS ABANDONED. THIS STATUTORY PERIOD CANNOT BE EXTENDED. SEE 35 U.S.C. 151. THE ISSUE FEE DUE INDICATED ABOVE DOES NOT REFLECT A CREDIT FOR ANY PREVIOUSLY PAID ISSUE FEE IN THIS APPLICATION. IF AN ISSUE FEE HAS PREVIOUSLY BEEN PAID IN THIS APPLICATION (AS SHOWN ABOVE), THE RETURN OF PART B OF THIS FORM WILL BE CONSIDERED A REQUEST TO REAPPLY THE PREVIOUSLY PAID ISSUE FEE TOWARD THE ISSUE FEE NOW DUE.

HOW TO REPLY TO THIS NOTICE:

I. Review the ENTITY STATUS shown above. If the ENTITY STATUS is shown as SMALL or MICRO, verify whether entitlement to that entity status still applies.

If the ENTITY STATUS is the same as shown above, pay the TOTAL FEE(S) DUE shown above.

If the ENTITY STATUS is changed from that shown above, on PART B - FEE(S) TRANSMITTAL, complete section number 5 titled "Change in Entity Status (from status indicated above)".

For purposes of this notice, small entity fees are 40% the amount of undiscounted fees, and micro entity fees are 20% the amount of undiscounted fees.

II. PART B - FEE(S) TRANSMITTAL, or its equivalent, must be completed and returned to the United States Patent and Trademark Office (USPTO) with your ISSUE FEE and PUBLICATION FEE (if required). If you are charging the fee(s) to your deposit account, section "4b" of Part B - Fee(s) Transmittal should be completed. If an equivalent of Part B is filed, a request to reapply a previously paid issue fee must be clearly made, and delays in processing may occur due to the difficulty in recognizing the paper as an equivalent of Part B.

III. All communications regarding this application must give the application number. Please direct all communications prior to issuance to Mail Stop ISSUE FEE unless advised to the contrary.

IMPORTANT REMINDER: Maintenance fees are due in utility patents issuing on applications filed on or after Dec. 12, 1980. It is patentee's responsibility to ensure timely payment of maintenance fees when due. More information is available at www.uspto.gov/PatentMaintenanceFees.

PART B - FEE(S) TRANSMITTAL

Complete and send this form, together with applicable fee(s), by mail or fax, or via the USPTO patent electronic filing system.

By mail, send to: Mail Stop ISSUE FEE
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

By fax, send to: (571)-273-2885

INSTRUCTIONS: This form should be used for transmitting the ISSUE FEE and PUBLICATION FEE (if required). Blocks 1 through 5 should be completed where appropriate. All further correspondence will be mailed to the current correspondence address as indicated unless corrected below or directed otherwise in Block 1, by (a) specifying a new correspondence address; and/or (b) indicating a separate "FEE ADDRESS" for maintenance fee notifications. **Because electronic patent issuance may occur shortly after issue fee payment, any desired continuing application should preferably be filed prior to payment of this issue fee in order not to jeopardize copendency.**

CURRENT CORRESPONDENCE ADDRESS (Note: Use Block 1 for any change of address)

24341 7590 12/07/2023
Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

Note: A certificate of mailing can only be used for domestic mailings of the Fee(s) Transmittal. This certificate cannot be used for any other accompanying papers. Each additional paper, such as an assignment or formal drawing, must have its own certificate of mailing or transmission.

Certificate of Mailing or Transmission

I hereby certify that this Fee(s) Transmittal is being deposited with the United States Postal Service with sufficient postage for first class mail in an envelope addressed to the Mail Stop ISSUE FEE address above, or being transmitted to the USPTO via the USPTO patent electronic filing system or by facsimile to (571) 273-2885, on the date below.

(Typed or printed name)
(Signature)
(Date)

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/973,506	10/25/2022	Paresh K. Patel	104402-5072-US	5383

TITLE OF INVENTION: Method and System for Asynchronous Mobile Payments for Multiple In-Person Transactions Conducted in Parallel

APPLN. TYPE	ENTITY STATUS	ISSUE FEE DUE	PUBLICATION FEE DUE	PREV. PAID ISSUE FEE	TOTAL FEE(S) DUE	DATE DUE
nonprovisional	SMALL	$480	$0.00	$0.00	$480	03/07/2024

EXAMINER	ART UNIT	CLASS-SUBCLASS
HAMILTON, MATTHEW L	3682	705-071000

1. Change of correspondence address or indication of "Fee Address" (37 CFR 1.363).

❑ Change of correspondence address (or Change of Correspondence Address form PTO/AIA/122 or PTO/SB/122) attached.

❑ "Fee Address" indication (or "Fee Address" Indication form PTO/AIA/47 or PTO/SB/47; Rev 03-02 or more recent) attached. **Use of a Customer Number is required.**

2. For printing on the patent front page, list
(1) The names of up to 3 registered patent attorneys or agents OR, alternatively,
(2) The name of a single firm (having as a member a registered attorney or agent) and the names of up to 2 registered patent attorneys or agents. If no name is listed, no name will be printed.

1 _____
2 _____
3 _____

3. ASSIGNEE NAME AND RESIDENCE DATA TO BE PRINTED ON THE PATENT (print or type)

PLEASE NOTE: Unless an assignee is identified below, no assignee data will appear on the patent. If an assignee is identified below, the document must have been previously recorded, or filed for recordation, as set forth in 37 CFR 3.11 and 37 CFR 3.81(a). Completion of this form is NOT a substitute for filing an assignment.

(A) NAME OF ASSIGNEE (B) RESIDENCE: (CITY and STATE OR COUNTRY)

Please check the appropriate assignee category or categories (will not be printed on the patent) : ❑ Individual ❑ Corporation or other private group entity ❑ Government

4a. Fees submitted: ❑Issue Fee ❑Publication Fee (if required)

4b. Method of Payment: *(Please first reapply any previously paid fee shown above)*

❑ Electronic Payment via the USPTO patent electronic filing system ❑ Enclosed check ❑ Non-electronic payment by credit card (Attach form PTO-2038)

❑ The Director is hereby authorized to charge the required fee(s), any deficiency, or credit any overpayment to Deposit Account No. _____

5. **Change in Entity Status** (from status indicated above)

❑ Applicant certifying micro entity status. See 37 CFR 1.29

❑ Applicant asserting small entity status. See 37 CFR 1.27

❑ Applicant changing to regular undiscounted fee status.

NOTE: Absent a valid certification of Micro Entity Status (see forms PTO/SB/15A and 15B), issue fee payment in the micro entity amount will not be accepted at the risk of application abandonment.

NOTE: If the application was previously under micro entity status, checking this box will be taken to be a notification of loss of entitlement to micro entity status.

NOTE: Checking this box will be taken to be a notification of loss of entitlement to small or micro entity status, as applicable.

NOTE: This form must be signed in accordance with 37 CFR 1.31 and 1.33. See 37 CFR 1.4 for signature requirements and certifications.

Authorized Signature _____ Date _____

Typed or printed name _____ Registration No. _____

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United States Patent and Trademark Office
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www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
17/973,506	10/25/2022	Paresh K. Patel	104402-5072-US	5383

24341 7590 12/07/2023

Morgan, Lewis & Bockius LLP (PA)
1400 Page Mill Road
Palo Alto, CA 94304-1124

EXAMINER	
HAMILTON, MATTHEW L	
ART UNIT	PAPER NUMBER
3682	

DATE MAILED: 12/07/2023

Determination of Patent Term Adjustment under 35 U.S.C. 154 (b)
(Applications filed on or after May 29, 2000)

The Office has discontinued providing a Patent Term Adjustment (PTA) calculation with the Notice of Allowance.

Section 1(h)(2) of the AIA Technical Corrections Act amended 35 U.S.C. 154(b)(3)(B)(i) to eliminate the requirement that the Office provide a patent term adjustment determination with the notice of allowance. See Revisions to Patent Term Adjustment, 78 Fed. Reg. 19416, 19417 (Apr. 1, 2013). Therefore, the Office is no longer providing an initial patent term adjustment determination with the notice of allowance. The Office will continue to provide a patent term adjustment determination with the Issue Notification Letter that is mailed to applicant approximately three weeks prior to the issue date of the patent, and will include the patent term adjustment on the patent. Any request for reconsideration of the patent term adjustment determination (or reinstatement of patent term adjustment) should follow the process outlined in 37 CFR 1.705.

Any questions regarding the Patent Term Extension or Adjustment determination should be directed to the Office of Patent Legal Administration at (571)-272-7702. Questions relating to issue and publication fee payments should be directed to the Customer Service Center of the Office of Patent Publication at 1-(888)-786-0101 or (571)-272-4200.

OMB Clearance and PRA Burden Statement for PTOL-85 Part B

The Paperwork Reduction Act (PRA) of 1995 requires Federal agencies to obtain Office of Management and Budget approval before requesting most types of information from the public. When OMB approves an agency request to collect information from the public, OMB (i) provides a valid OMB Control Number and expiration date for the agency to display on the instrument that will be used to collect the information and (ii) requires the agency to inform the public about the OMB Control Number's legal significance in accordance with 5 CFR 1320.5(b).

The information collected by PTOL-85 Part B is required by 37 CFR 1.311. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 30 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, Virginia 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, Virginia 22313-1450. Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it displays a valid OMB control number.

Privacy Act Statement

The Privacy Act of 1974 (P.L. 93-579) requires that you be given certain information in connection with your submission of the attached form related to a patent application or patent. The United States Patent and Trademark Office (USPTO) collects the information in this record under authority of 35 U.S.C. 2. The USPTO's system of records is used to manage all applicant and owner information including name, citizenship, residence, post office address, and other information with respect to inventors and their legal representatives pertaining to the applicant's/ owner's activities in connection with the invention for which a patent is sought or has been granted. The applicable Privacy Act System of Records Notice for the information collected in this form is COMMERCE/PAT-TM-7 Patent Application Files, available in the Federal Register at 78 FR 19243 (March 29, 2013).
https://www.govinfo.gov/content/pkg/FR-2013-03-29/pdf/2013-07341.pdf

Routine uses of the information in this record may include disclosure to:

1) law enforcement, in the event that the system of records indicates a violation or potential violation of law;
2) a federal, state, local, or international agency, in response to its request;
3) a contractor of the USPTO having need for the information in order to perform a contract;
4) the Department of Justice for determination of whether the Freedom of Information Act (FOIA) requires disclosure of the record;
5) a Member of Congress submitting a request involving an individual to whom the record pertains, when the individual has requested the Member's assistance with respect to the subject matter of the record;
6) a court, magistrate, or administrative tribunal, in the course of presenting evidence, including disclosures to opposing counsel in the course of settlement negotiations;
7) the Administrator, General Services Administration (GSA), or their designee, during an inspection of records conducted by GSA under authority of 44 U.S.C. 2904 and 2906, in accordance with the GSA regulations and any other relevant (i.e., GSA or Commerce) directive, where such disclosure shall not be used to make determinations about individuals;
8) another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c));
9) the Office of Personnel Management (OPM) for personnel research purposes; and
10) the Office of Management and Budget (OMB) for legislative coordination and clearance.

If you do not furnish the information requested on this form, the USPTO may not be able to process and/or examine your submission, which may result in termination of proceedings, abandonment of the application, and/or expiration of the patent.

Notice of Allowability	Application No. 17/973,506	Applicant(s) Patel et al.	
	Examiner MATTHEW L HAMILTON	Art Unit 3682	AIA (FITF) Status Yes

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--

All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☑ This communication is responsive to October 25, 2023.
   ☐ A declaration(s)/affidavit(s) under **37 CFR 1.130(b)** was/were filed on _____.

2. ☐ An election was made by the applicant in response to a restriction requirement set forth during the interview on _____; the restriction requirement and election have been incorporated into this action.

3. ☑ The allowed claim(s) is/are 1-20 . As a result of the allowed claim(s), you may be eligible to benefit from the **Patent Prosecution Highway** program at a participating intellectual property office for the corresponding application. For more information, please see **http://www.uspto.gov/patents/init_events/pph/index.jsp** or send an inquiry to **PPHfeedback@uspto.gov.**

4. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

   Certified copies:

   a) ☐ All b) ☐ Some* c) ☐ None of the:

   1. ☐ Certified copies of the priority documents have been received.
   2. ☐ Certified copies of the priority documents have been received in Application No. _____ .
   3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

   * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application.
THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.
   ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

   Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☑ Notice of References Cited (PTO-892)
2. ☑ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date 10/25/2023.
3. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material _____.
4. ☐ Interview Summary (PTO-413), Paper No./Mail Date. _____.
5. ☐ Examiner's Amendment/Comment
6. ☑ Examiner's Statement of Reasons for Allowance
7. ☐ Other _____.

/MATTHEW L HAMILTON/
Primary Examiner, Art Unit 3682

DETAILED ACTION

Continued Examination Under 37 CFR 1.114

A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after allowance or after an Office action under *Ex Parte Quayle*, 25 USPQ 74, 453 O.G. 213 (Comm'r Pat. 1935). Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, prosecution in this application has been reopened pursuant to 37 CFR 1.114. Applicant's submission filed on October 25, 2023 has been entered. Claims 1-20 have been examined and are currently pending.

Notice of Pre-AIA or AIA Status

The present application, filed on or after March 16, 2013, is being examined under the first inventor to file provisions of the AIA.

Inventorship

This application currently names joint inventors. In considering patentability of the claims the examiner presumes that the subject matter of the various claims was commonly owned as of the effective filing date of the claimed invention(s) absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and effective filing dates of each claim that was not commonly owned as of the effective filing date of the later invention in order for the examiner to consider the applicability of 35 U.S.C. 102(b)(2)(C) for any potential 35 U.S.C. 102(a)(2) prior art against the later invention.

Information Disclosure Statement

The Information Disclosure Statement filed on October 25, 2023 has been considered. An initialed copy of the Form 1449 is enclosed herewith.

Allowable Subject Matter

Claim 1-20 is allowed.

The applicant's invention discloses a mobile consumer device with a display, processor(s), and memory: identifies a merchant device in proximity to the consumer device based on broadcasted information transmitted by the first merchant device, the broadcasted information including a first identifier corresponding to the first merchant device; transmits the first identifier to a server and receives from the server an electronic communication including identification and transaction information associated with the merchant; displays the identification information, receives user selection of the merchant identification information; and in response, displays the merchant transaction information, receives supplemental user information, and transmits the supplemental transaction information to the server for completion of the transaction.

Claim 1 is allowed because no prior art in combination, fails to teach or suggest or otherwise make obvious, all the limitations comprising:

and first merchant transaction information identifying a proposed in-person transaction between the consumer device and the first merchant, wherein the first merchant transaction information includes a merchant-specified transaction amount;

displaying the first merchant transaction information;

receiving from the user of the consumer device first supplemental transaction information, wherein the first supplemental transaction information is a selection of the merchant-specified transaction amount;

Independent claim 8 and 14 are allowed based on a similar rationale. Dependent claims 2-7, 9-13, and 15-20 are allowable based on the same rationale as the claims from which they depend.

The Examiner notes the applicant's invention is directed to patentable eligible subject matter under 35 U.S.C. 101. The applicant's invention provides an improvement over past systems, the applicant's specification discloses, "Traditional electronic payment systems for in-person transactions are one-to-one such that there is one merchant and one consumer conducting one transaction at a time. The process requires a captive, exclusive interaction between the merchant and consumer, and typically neither party may disengage from the process until the payment has completed or has been cancelled." (paragraph 0008), "Additionally, other consumers who want to make a payment to the same merchant must wait until the current transaction has completed processing. Consumers interact with the merchant sequentially and wait their turn." (paragraph 0009), "This system is acceptable in traditional retail situations where one consumer is purchasing a good or service and needs the merchant to perform "check out" tasks. In such electronic payment systems, the payment transaction is first initiated by the merchant (e.g., requesting a consumer pay a certain amount). These electronic payment systems do not work well when there are multiple consumers needing to pay a single merchant at approximately the same time, or when the merchant is not able to initiate the payment process." (paragraph 0010), "Implementations described herein provide methods and systems for enabling electronic payments via a mobile device such that multiple consumers can initiate overlapping in-person payments to a single merchant at the same time, or substantially the same time.

Moreover, in some implementations, the consumer has the option to send payment to a merchant without the merchant having to request payment first." (paragraph 0012), "There are numerous use cases for such a system, some of which are currently only handled by cash payments (since existing electronic payment systems do not address the need to have multiple parties sending payments to a single merchant). One example use case involves payments to a street performer, who would traditionally put out a box, hat, or an open guitar case (collectively referred to as collection box) for audience payments. As he or she is performing, any number of audience members can drop cash into the collection box to pay the performer." (paragraph 0013) and "Notably, the performer (or in different contexts, a merchant) is not required to initiate the payment with each consumer and does not need to stop doing what he or she is doing. A plurality of consumers can also pay the performer/merchant without needing to wait for each transaction to finish. The transaction is asynchronous as the performer/merchant need not acknowledge the transaction before the next payment and may not acknowledge the payment at all. Methods and systems described herein allow this and similar in-person payment scenarios to be handled via electronic payments managed via mobile electronic devices associated with a merchant/performer and one or more customers." (paragraph 0014).

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

Bailey, B., Mobile-Phone Payment Option Gains Ground, McClatchy-Tribune News Service, April 14, 2010

Obopay is a company that lets users open an account, with funds from a bank or credit card, then transfer money to another person's cell phone number by sending a text message.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to MATTHEW L HAMILTON whose telephone number is (571)270-1837. The examiner can normally be reached Monday-Thursday 9:30-5:30 pm EST.

Examiner interviews are available via telephone, in-person, and video conferencing using a USPTO supplied web-based collaboration tool. To schedule an interview, applicant is encouraged to use the USPTO Automated Interview Request (AIR) at http://www.uspto.gov/interviewpractice.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Waseem Ashraf can be reached on (571)270-3948. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of published or unpublished applications may be obtained from Patent Center. Unpublished application information in Patent Center is available to registered users. To file and manage patent submissions in Patent Center, visit: https://patentcenter.uspto.gov. Visit https://www.uspto.gov/patents/apply/patent-center for more information about Patent Center and https://www.uspto.gov/patents/docx for information about filing in DOCX format. For additional questions, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/MATTHEW L HAMILTON/
Primary Examiner, Art Unit 3682

Notice of References Cited	Application/Control No. 17/973,506	Applicant(s)/Patent Under Reexamination Patel et al.	
	Examiner MATTHEW L HAMILTON	Art Unit 3682	Page 1 of 1

U.S. PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Name	CPC Classification	US Classification
	A					
	B					
	C					
	D					
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	F					
	G					
	H					
	I					
	J					
	K					
	L					
	M					

FOREIGN PATENT DOCUMENTS

*		Document Number Country Code-Number-Kind Code	Date YYYY-MM-DD	Country	Name	CPC Classification
	N					
	O					
	P					
	Q					
	R					
	S					
	T					

NON-PATENT DOCUMENTS

*		Include as applicable: Author, Title Date, Publisher, Edition or Volume, Pertinent Pages)
	U	Bailey, B., Mobile-Phone Payment Option Gains Ground, McClatchy-Tribune News Service, April 14, 2010 (Year: 2010)
	V	
	W	
	X	

*A copy of this reference is not being furnished with this Office action. (See MPEP § 707.05(a).)
Dates in YYYY-MM-DD format are publication dates. Classifications may be US or foreign.

TO: padocketingdepartment@morganlewis.com,donald.mixon@morganlewis.com
FROM: noreply@uspto.gov
CC: patentcenter_eofficeaction@uspto.gov
SUBJECT: USPTO: Patent Electronic System - Correspondence Notification for Customer Number 24341

Fri Jan 26 05:00:20 EST 2024

Dear Patent Center Customer:

Correspondence Address:

Morgan, Lewis &Bockius LLP (PA)
1400 Page Mill Road
Palo Alto,CALIFORNIA,94304-1124
UNITED STATES

This is a courtesy notification regarding the following USPTO patent application(s) associated with your Customer Number, 24341, that have new outgoing correspondence. This correspondence is now available for viewing in Patent Center.

The official date of notification of the outgoing correspondence will be indicated on the form (e.g., PTOL-90) accompanying the correspondence.

Disclaimer:
The list of documents shown below are provided as a courtesy and is not part of the official file wrapper. The content of the images shown in the Image File Wrapper is the official record.

Application	Document	Mailroom Date	Attorney Docket No.
18197071	NOA	01/26/2024	104402-5075-US
18197071	892	01/26/2024	104402-5075-US
18197071	1449	01/26/2024	104402-5075-US

To view your correspondence online, please sign in to Patent Center and then select Workbench/View correspondence. To update your email address(es), select Manage/Manage customer numbers.

If you have any questions, please contact the Patent Electronic Business Center (EBC) at ebc@uspto.gov or 866-217-9197 Monday – Friday, 6 a.m. to midnight ET.

Please do not reply to this email as it was sent from an unmonitored mailbox.

Sincerely,

The Patent Center Team

Espacenet

Bibliographic data: CN109389755 (A) — 2019-02-26

Cup type vending machine

Inventor(s): MATSUMOTO HISAO; AZAYANAGI YASUHIKO ± (松本尚男, ; 畔柳靖彦)

Applicant(s): FUJI ELECTRIC CO LTD ± (富士电机株式会社)

Classification: **- international:** ***A47J31/40; F25C1/00; G07F13/06; G07F13/10***
- cooperative: A47J31/401 (CN); F25C1/00 (CN); G07F13/065 (CN); G07F13/10 (CN)

Application number: CN201710714122 20170810 Global Dossier

Priority number(s): CN201710714122 20170810

Abstract of CN109389755 (A)

The invention relates to a cup type vending machine (1), which comprises a shell (2), the inner part of the shell is provided with a cup supply mechanism (C) for sequentially supplying cups (W) from afilled cup row (WK); a raw material supply mechanism (D) for storing a powder raw material as a raw material of a beverage in a tank (D10) and supplying the powder raw material to the cup from the tank (D10); an ice machine (G) that generates ice and supplies ice to the cup (W); and a warm water tank (F) for supplying hot water stored in the warm water tank to the cup (W), wherein the cup type vending machine (1) generates a beverage by supplying the powder material and hot water to the cup (W), in the cup type vending machine (1), the shell (2) has an opening on the front surface, and a front surface door (3) is supported at an opening edge part of the shell (2), and the front surface door (3) opens and closes the front surface opening of the shell (2) by a hinge (T116) with a hinge axisin a vertical direction, in the shell (2), the ice machine (G) and a power supply box (T118) are arranged on one side provided with the hinge (T116), and the warm water tank (F) and the cup supply mechanism (C) are arranged on the door opening/closing side of the front surface door (3), thereby a large size is avoided.

Notice

DESCRIPTION CN109389755A

10 cup vending machine

[0001]

14 Technical field

[0002]

18 The present invention relates to a cup-type automatic vending machine.

[0003]

22 Background technique

[0004]

26 Compared with vending machines that sell canned drinks, cup-type vending machines have various mechanisms arranged inside the device casing.

28 That is, if it is a vending machine that sells canned beverages, a column for storing canned beverages may be provided inside the device casing.

30 On the other hand, in the case of a cup-type vending machine, it is necessary to generate a beverage inside the device casing and supply the beverage to a cup before transporting it out. Therefore, at least the following mechanism parts are required.

[0005]

36 • Cup supply mechanism, which supplies cups;

[0006]

• A raw material supply mechanism that stores powder raw materials as raw materials for beverages in a tank and supplies the powder raw materials from the tank to the supplied cups;

[0007]

• An ice making machine that generates ice and supplies ice to the supplied cup;

[0008]

• A warm water tank that supplies hot water stored inside the warm water tank to the supplied cup.

[0009]

Patent Document 1: Japanese Patent Application Publication No. 2009-276986

[0010]

Contents of the invention

[0011]

Invent the problem to be solved

[0012]

Therefore, as a cup-type vending machine, the following issue is extremely important in terms of preventing the enlargement of the cup-type vending machine: how to efficiently arrange each of the above-mentioned mechanical parts inside the device casing.

[0013]

In view of the above-mentioned actual situation, an object of the present invention is to provide a cup-type automatic vending machine that can prevent enlargement.

[0014]

solutions to problems

[0015]

In order to achieve the above object, the cup-type vending machine according to the present invention is equipped with: a cup supply mechanism that sequentially supplies cups from the filled cup row; and a raw material supply mechanism that supplies raw materials for beverages inside the equipment casing. The powder raw material is stored in a tank, and the powder raw material is supplied to the cup from the tank; an ice making machine generates ice and supplies ice to the cup; and a warm water tank, which supplies the ice to the cup. The cup supplies hot water stored in the warm water tank, and the cup-type vending machine generates a beverage by supplying powder raw materials and hot water to the cup. The cup-type vending machine is characterized by: The device case has an opening on the front surface, and a front door is supported on the opening edge of the device case. The front door opens and closes the device by a hinge having a hinge axis along a vertical direction. The front surface of the casing is open, and inside the equipment casing, the ice maker and the power box are disposed on the side where the hinge is provided, and the switch door side of the front surface door is disposed on the side. Warm water tank and cup supply mechanism.

[0016]

In addition, the present invention is characterized in that, in the above-mentioned cup type vending machine, the cup supply mechanism is attached to the equipment housing in a state in which the cup supply mechanism Can be pulled out to the front of the device housing.

[0017]

Moreover, this invention is characterized by the above-mentioned cup type vending machine in which the said tank is arrange|positioned between the said warm water tank and the said cup supply mechanism.

[0018]

In addition, the present invention is characterized in that, in the above-mentioned cup-type vending machine, the ice maker is disposed closer to the power box than the power box, and the warm water tank is disposed closer to the cup supply mechanism. The position on the inside.

[0019]

Effect of invention

[0020]

According to the present invention, the ice maker, the cup supply mechanism, and the raw material supply mechanism, which require relatively space for installation, are disposed on the left and right inside the equipment housing. Therefore, the front and rear dimensions can be miniaturized and the device can be prevented from being enlarged.

[0021]

123 Description of the drawings

[0022]

127 FIG. 1 is a block diagram schematically showing a cup-type vending machine.

[0023]

131 Figure 2 is a front view of the cup-type vending machine.

[0024]

135 Fig. 3 is a side view of the cup-type vending machine.

[0025]

139 Figure 4 shows a specific example of the cup supply mechanism shown in Figure 1. (a) is an appearance perspective view of a single type of round cup supply mechanism, (b) is an appearance perspective view of two types of round cup supply mechanisms, (c) is an appearance perspective view of a single type of round cup supply mechanism. (d) is an appearance perspective view of the supply mechanism for single-type square cups.

[0026]

147 Fig. 5 is an enlarged perspective view of the single type circular cup supply mechanism shown in Fig. 4(a).

[0027]

151 FIG. 6 is an enlarged exploded perspective view of a main part of the single-type round cup supply mechanism shown in FIG. 5.

[0028]

156 Fig. 7 shows the single type circular cup supply mechanism shown in Fig. 5, (a) is a side view, and (b) is a cross-sectional view along line c1-c1 in (a).

[0029]

161 FIG. 8 is an exploded perspective view of a cup drop ring applied to the single type of circular cup supply mechanism shown in FIG. 5.

[0030]

166 FIG. 9 is a cross-sectional top view of a cup drop ring applied to the single type of circular cup supply mechanism shown in FIG. 5.

[0031]

171 Fig. 10 shows the driving mechanism and cup drop ring used in the single round cup supply mechanism shown in Fig. 5. (a) is a perspective view of the main parts, and (b) is a top view.

[0032]

176 11 is a side view conceptually illustrating a state in which cups are separated by a cup drop ring applied to the single type of round cup supply mechanism shown in FIG. 5 in order from (a) to (c).

[0033]

181 12 is a cross-sectional plan view conceptually illustrating the conveying operation of the cup array stored in the round cup container of the single type round cup supply mechanism shown in FIG. 5 in order from (a) to (c).

[0034]

187 FIG. 13 is a cross-sectional plan view conceptually illustrating the conveying operation of the cup array performed following FIG. 12(c) in (a) and (b).

[0035]

192 14 is a cross-sectional plan view conceptually illustrating the return operation of the cup array stored in the round cup holder of the single type round cup supply mechanism shown in FIG. 5 in order (a) and (b).

[0036]

197 Fig. 15 is an enlarged perspective view of two types of circular cup supply mechanisms shown in Fig. 4(b).

[0037]

201 FIG. 16 is a cross-sectional plan view conceptually showing the internal structures of the two types of circular cup supply mechanisms shown in FIG. 15.

[0038]

206 FIG. 17 is an enlarged perspective view of the single type circular + single type single row cup supply mechanism shown in FIG. 4(c).

[0039]

211 FIG. 18 is a cross-sectional plan view conceptually showing the internal structure of the single type circular + single type single row cup supply mechanism shown in FIG. 17.

[0040]

216 FIG. 19 is an enlarged view of the single type square cup supply mechanism shown in FIG. 4(d), with (a) being an external perspective view and (b) being an internal perspective view.

[0041]

221 FIG. 20 shows the single square cup supply mechanism shown in FIG. 19(b), with (a) being a top view and (b) being a front view.

[0042]

226 Fig. 21 is a cross-sectional view along line c2-c2 in Fig. 20(b).

[0043]

230 Fig. 22 shows a bottom guide used in the single square cup supply mechanism shown in Fig. 19, (a) is a top view, and (b) is a front view.

[0044]

235 Fig. 23 shows a driving device used in the single square cup supply mechanism shown in Fig. 19, (a) is a rear view, and (b) is a top view.

[0045]

240 Figure 24 shows sequentially the replenishment operation of the reserve cup row from the right reserve aisle to the sales aisle in the single type square cup supply mechanism shown in Figure 19. (a) is a top view showing the state before the sales operation starts. (b) and (c) are top views of the state in which the reserve cup row is moved to the sales aisle side.

[0046]

247 Fig. 25 shows the replenishment operation of the preliminary cup row performed following Fig. 24(c). (a) is a

top view of the preliminary cup row just before it falls to the cup row feeding port. (b) is the preliminary cup row being replenished to the sales port. A top view of the state of the cargo lane, (c) is a top view showing the state of the push rod returning to the standby position.

[0047]

254 FIG. 26 is an external perspective view showing the structure of a powder raw material supply mechanism as a specific example of the raw material supply mechanism shown in FIG. 1.

[0048]

259 FIG. 27 is a perspective view showing a part of the powder raw material supply mechanism shown in FIG. 26 in a broken state.

[0049]

264 FIG. 28 is a cross-sectional side view of the tank of the powder raw material supply mechanism shown in FIG. 26.

[0050]

269 FIG. 29 is an exploded perspective view of the tank shown in FIG. 28.

[0051]

273 Fig. 30 is a sectional side view showing the main part of the chute of the powder raw material supply mechanism shown in Fig. 26;

[0052]

278 FIG. 31 is a perspective view of the gate provided with the chute shown in FIG. 30.

[0053]

282 FIG. 32 is a conceptual diagram of a heater provided in the chute shown in FIG. 30.

[0054]

286 FIG. 33 is a perspective view showing a part of the shutter opening and closing device used in the powder raw material supply mechanism shown in FIG. 26 in a broken state.

[0055]

Fig. 34 is a perspective view of the gate opening and closing device shown in Fig. 33 with the outer casing omitted.

[0056]

FIG. 35 is an enlarged perspective view showing a main part of the gate opening and closing device shown in FIG. 33.

[0057]

Fig. 36 shows the main part of the gate opening and closing device shown in Fig. 33, (a) is a right side view, and (b) is a left side view.

[0058]

Fig. 37 shows the gate opening and closing lever of the gate opening and closing device shown in Fig. 33, (a) is a right side view, and (b) is a left side view.

[0059]

Fig. 38 shows the selector lever of the gate opening and closing device shown in Fig. 33, (a) is a right side view, and (b) is a left side view.

[0060]

Fig. 39 shows the cam device of the gate opening and closing device shown in Fig. 33, (a) is a right side view, and (b) is a left side view.

[0061]

FIG. 40 shows the operation of the shutter opening and closing device shown in FIG. 33, and is a side view of the state where the selector lever is pressed by the housing of the cup transport mechanism.

[0062]

Fig. 41 shows the operation of the shutter opening and closing device shown in Fig. 33, and is a side view of the state in which the cup is returned to the bottom of the chute.

[0063]

Fig. 42 is a side view showing the operation of the gate opening and closing device shown in Fig. 33 in order

from (a) to (c).

[0064]

336 Fig. 43 shows the operation of the gate opening and closing device shown in Fig. 33, and is a side view of the state in which the gate opening and closing lever opens the gate.

[0065]

341 FIG. 44 shows the operation of the gate opening and closing device shown in FIG. 33, and is a side view of a state in which the gate is rotated and vibrated to cause adhering powdery raw materials to fall.

[0066]

346 Figure 45 shows the heating reference plane of the heater installed in the chute. (a) is a cross-sectional view of the heater that is bent, (b) is a cross-sectional view of the heater that is bent twice, and (c) is bent. Cross-sectional view of the heater.

[0067]

352 46 is a cross-sectional side view showing a tank of an extraction raw material supply mechanism as a specific example of the raw material supply mechanism shown in FIG. 1.

[0068]

357 FIG. 47 is an exploded perspective view of the tank of the extraction raw material supply mechanism shown in FIG. 46.

[0069]

362 FIG. 48 is a diagram schematically showing the drinking water supply system of the cup vending machine shown in FIG. 1.

[0070]

367 FIG. 49 is an external perspective view showing the specific structure of the reservoir shown in FIG. 1.

[0071]

371 FIG. 50 is a partially broken perspective view of the liquid reservoir shown in FIG. 49.

[0072]

375 Figure 51 is a cross-sectional front view of the reservoir shown in Figure 49.

[0073]

379 Figure 52 is a cross-sectional side view of the reservoir shown in Figure 49.

[0074]

383 Fig. 53 shows the main part of the reservoir shown in Fig. 49, (a) is a cross-sectional side view of the rod position-maintaining shaft inserted into the upper insertion hole, (b) is the rod position-maintaining shaft inserted into the lower part. Cross-sectional side view of the hole inserted.

[0075]

389 FIG. 54 is an external perspective view showing a modification of the reservoir shown in FIG. 48.

[0076]

393 Fig. 55 shows the reservoir shown in Fig. 54, (a) is a plan view showing a state in which the protruding piece of the detection rod is not constrained, and (b) is a plan view showing a state in which the protruding piece is positioned at the insertion portion of the rod cover.

[0077]

399 FIG. 56 is a diagram showing the main part of the drinking water supply system shown in FIG. 48.

[0078]

403 Fig. 57 is a front view showing a structural example of the chlorine generating electrode.

[0079]

407 Fig. 58 is a side view showing a structural example of a chlorine generating electrode.

[0080]

411 Fig. 59 is a graph showing the relationship between the amount of chlorine generated and the current/voltage of the chlorine generating electrode.

[0081]

FIG. 60 is a front view showing a structural example of the chlorine generating electrode according to the first modified example.

[0082]

FIG. 61 is a side view showing a structural example of the chlorine generating electrode according to the first modified example.

[0083]

FIG. 62 is a front view showing a structural example of the chlorine generating electrode according to the second modified example.

[0084]

FIG. 63 is a front view showing a structural example of the chlorine generating electrode according to the third modified example.

[0085]

FIG. 64 is a side view showing a structural example of the chlorine generating electrode according to the third modification example.

[0086]

FIG. 65 is a front view showing a structural example of the chlorine generating electrode according to the fourth modification example.

[0087]

FIG. 66 is a side view showing a structural example of the chlorine generating electrode according to the fourth modification example.

[0088]

FIG. 67 is an external perspective view showing a specific example of the hot water tank shown in FIG. 1.

[0089]

Fig. 68 is a perspective view of the hot water tank shown in Fig. 67 with the front cover and the upper cover removed.

[0090]

460 Fig. 69 is a perspective view of the hot water tank shown in Fig. 67 in a state in which the front heat insulating material disposed on the front surface is removed.

[0091]

465 Fig. 70 is a perspective view of the hot water tank shown in Fig. 67 as viewed obliquely from above.

[0092]

469 FIG. 71 is an enlarged view of the lower part of the hot water tank shown in FIG. 67.

[0093]

473 Fig. 72 conceptually shows the internal structure of the hot water tank shown in Fig. 67. (a) is a diagram showing a state after the water level of the hot water tank has dropped, and (b) is a diagram showing a state after the water level of the hot water tank has risen.

[0094]

479 FIG. 73 is a diagram conceptually showing a specific example of the ice making machine shown in FIG. 1.

[0095]

483 Fig. 74 is a cross-sectional side view of the ice making machine shown in Fig. 73.

[0096]

487 FIG. 75 is a perspective view showing the ice chute of the ice making machine shown in FIG. 73.

[0097]

491 76 is a partial cross-sectional perspective view of a three-axis cup transport mechanism as a specific example of the cup transport mechanism shown in FIG. 1.

[0098]

496 Figure 77 is a partial cross-sectional perspective view of the cup holding device.

[0099]

Fig. 78 is a perspective view showing the cup baffle of the cup holding device.

[0100]

Fig. 79 shows the left cup baffle, (a) is a perspective view of the state with the accessory attached, and (b) is a perspective view of the state with the accessory removed.

[0101]

Fig. 80 shows the cup baffle on the right side, (a) is a perspective view showing a state with an accessory attached, and (b) is a perspective view showing a state with the accessory removed.

[0102]

81 is a perspective view showing a state in which the cup holder is arranged at a cup receiving position directly below the cup supply mechanism.

[0103]

FIG. 82 is a perspective view showing a suspended cup conveying mechanism as a specific example of the cup conveying mechanism shown in FIG. 1.

[0104]

83 is a diagram showing the arrangement position of a cup detection sensor that detects cup supply from a cup supply mechanism and outputs a cup detection signal.

[0105]

84 is a perspective view showing a cup supply mechanism, a cup holding device, a powder material supply mechanism, a stirring mechanism, and a take-out port mechanism.

[0106]

Fig. 85 is a perspective view showing a specific example of the stirring mechanism shown in Fig. 1.

[0107]

Fig. 86 is a perspective view of a stirring mechanism according to a modified example.

[0108]

542 Fig. 87 is a partial cross-sectional perspective view of the stirring mechanism according to the modification.

[0109]

546 Fig. 88 is a perspective view showing a grinder using a grinding device for extracting raw materials.

[0110]

550 Fig. 89 is an exploded perspective view of a grinder using a grinding device for extracting raw materials.

[0111]

554 Fig. 90 shows the polishing machine of Fig. 88, (a) is a top view, and (b) is a side view.

[0112]

558 Fig. 91 is a cross-sectional side view showing the internal structure of the grinder.

[0113]

562 Fig. 92 shows the stationary polishing part of the polishing machine, (a) is a perspective view, and (b) is an exploded perspective view.

[0114]

567 93 shows the rotary grinding part, the passage wall ring and the guide member of the grinder, (a) is a perspective view, and (b) is a perspective view of (a) omitting the passage wall ring and the guide member and showing only the rotary polishing part.

[0115]

573 Fig. 94 is an exploded perspective view showing the elements of Fig. 93(a).

[0116]

577 Fig. 95 is an explanatory diagram for explaining the grinding operation of coffee beans in the grinder.

[0117]

581 FIG. 96 is a diagram showing an example of a charging sequence.

[0118]

585 FIG. 97 is an explanatory diagram for explaining the movement of electric charges when coffee beans are ground in a grinder.

[0119]

590 FIG. 98 is a diagram schematically showing the internal structure of a cup-type vending machine equipped with a filter paper brewing mechanism.

[0120]

595 FIG. 99 is a diagram schematically showing the internal structure of a cup-type vending machine equipped with a permanent filter-type brewing mechanism.

[0121]

600 Figure 100 shows a paper brewing machine, (a) is a perspective view viewed from the upper right, and (b) is a perspective view viewed from the upper left.

[0122]

605 Fig. 101 shows a mesh brewing machine, (a) is a perspective view viewed from the upper right, and (b) is a perspective view viewed from the upper left.

[0123]

610 Figure 102 is an exploded perspective view of the paper brewing machine as viewed from the upper right.

[0124]

614 Figure 103 is an exploded perspective view of the paper brewing machine as viewed from the upper left.

[0125]

618 Fig. 104 is a perspective view of the drip unit showing a state in which the cylinder is removed from the cylinder frame.

[0126]

623 Fig. 105 shows a cylinder, (a) is a top view, and (b) is a cross-sectional view along line c3-c3 in (a).

[0127]

627 Figure 106 shows the cylinder frame, (a) is a top view, and (b) is a front view.

[0128]

631 Fig. 107 shows the drip unit with the outer cover of the cylinder frame omitted. (a) is a perspective view viewed from the front side, and (b) is a perspective view viewed from the rear side.

[0129]

636 FIG. 108 is a side view showing the internal structure of the right side wall of the cylinder frame with the outer cover omitted.

[0130]

641 109 is a side view showing the internal structure of the right side wall of the cylinder frame showing the cam groove of the cam disk.

[0131]

646 FIG. 110 is an enlarged view of the cam disk showing the cam groove.

[0132]

650 Fig. 111 is a sectional view of the cylinder frame shown in Fig. 106 taken along line c4-c4.

[0133]

654 112 is an explanatory diagram for explaining the detachment of the drip unit from the main body drive unit, and is a side view with a cover in a state before operating the detachment lever.

[0134]

659 113 is an explanatory diagram for explaining the detachment of the drip unit from the main body drive unit, and is a side view of the cover being detached in a state before operating the detachment lever.

[0135]

664 Fig. 114 is an explanatory view similar to Fig. 112, and is a side view of the cover with the cover after the detachment lever has been operated.

[0136]

669 FIG. 115 is an explanatory view similar to FIG. 113, and is a side view of the cover removed in a state where the removal lever is operated.

[0137]

674 Figure 116 shows the main body drive unit of the paper brewing machine, (a) is a perspective view, and (b) is a perspective view of the state in which the unit cover and the paper guide are removed.

[0138]

679 Figure 117 shows the main body drive unit of the mesh brewing machine, (a) is a perspective view, and (b) is a perspective view of the state with the scraper removed.

[0139]

684 Fig. 118 is a left side view showing the internal structure of the main body drive unit.

[0140]

688 Fig. 119 is a left side view showing the internal structure of the main body drive unit of the mesh brewing machine.

[0141]

693 Fig. 120 is a right side view showing the internal structure of the main body drive unit.

[0142]

697 Figure 121 shows the filter paper feeding device, (a) is a perspective view seen from the upper right, and (b) is a perspective view seen from the upper left.

[0143]

702 Fig. 122 shows the paper rack unit, (a) is a perspective view of the paper release door in a closed state, and (b) is a perspective view of the paper release door in an open state.

[0144]

707 Fig. 123 shows the paper holder unit, (a) is a top view, and (b) is a cross-sectional view along line c5-c5 in (a).

[0145]

711 Fig. 124 shows the paper holder unit, (a) is a left side view in a state in which the cover of the left side wall is omitted, and (b) is a cross-sectional view along line c6-c6 in (a).

[0146]

716 Figure 125 illustrates the paper end detection lever, (a) is a top view, and (b) is a left side view.

[0147]

720 Fig. 126 shows the lock structure of the drum driving mechanism, (a) is a diagram for explaining the locked state, and (b) is a diagram for explaining the unlocked state.

[0148]

725 Fig. 127 shows the paper drive unit, (a) is a perspective view seen from the upper right, and (b) is a perspective view seen from the upper left.

[0149]

730 FIG. 128 shows a paper holder unit and a paper drive unit, (a) is a diagram showing a state in which the two units are separated, and (b) is a diagram showing a state in which the two units are connected.

[0150]

735 FIG. 129 is a flowchart showing the execution process of the coffee sales operation.

[0151]

739 FIG. 130 is a flowchart showing the initial processing for discharging the extraction residue shown in FIG. 129 .

[0152]

744 Fig. 131 is a flowchart showing the coffee extraction process shown in Fig. 129.

[0153]

748 FIG. 132 is a flowchart showing the large-capacity extraction process shown in FIG. 131 .

[0154]

752 FIG. 133 is a flowchart showing the extraction residue discharge process shown in FIG. 129.

[0155]

756 FIG. 134 is an explanatory diagram for sequentially explaining the standby state of the operation of the paper brewing machine when selling coffee.

[0156]

761 Fig. 135 is an explanatory diagram for sequentially explaining the operation of the paper brewing machine at the time of selling coffee, including the supply state of raw materials and hot water to the cylinder.

[0157]

766 136 is an explanatory diagram for sequentially explaining the operation of the paper brewing machine when selling coffee, and is an explanatory diagram of the supply state of hot water after supply to the cylinder.

[0158]

771 Fig. 137 is an explanatory diagram following Fig. 136, showing a state in which the cylinder head is advanced and positioned directly above the cylinder.

[0159]

776 FIG. 138 is an explanatory diagram following FIG. 137, showing a state in which the cylinder head seals the upper surface of the cylinder.

[0160]

781 FIG. 139 is an explanatory diagram following FIG. 138, showing a state in which the sealing of the upper surface of the cylinder by the cylinder head is released after the coffee delivery is completed.

[0161]

786 FIG. 140 is an explanatory diagram following FIG. 139, showing a state in which the cylinder head is retracted and returned to the standby position, and flushing hot water is injected into the open cylinder for the first time.

[0162]

792 Fig. 141 is an explanatory diagram following Fig. 140, showing a state in which the filter block is lowered and flushing hot water is injected into the cylinder for the second time.

[0163]

797 Fig. 142 is an explanatory diagram following Fig. 141 and shows a state in which the extraction residue is discharged by feeding out the filter paper.

[0164]

802 143 is a diagram for explaining the operation of the paper brewing machine when an increment of coffee is selected during coffee sales, and shows a supply state of additional hot water being supplied to the cylinder after the first delivery of coffee is completed.

[0165]

808 144 is a diagram for explaining the operation of the paper brewing machine when an increment of coffee is selected during coffee sales, and shows the state of the upper surface of the cylinder head sealing cylinder after additional supply of hot water.

[0166]

814 FIG. 145 is an explanatory diagram for sequentially explaining the operation of the mesh brewing machine when extracting grounds are discharged to the front when selling coffee, and shows a standby state.

[0167]

819 Fig. 146 is an explanatory diagram for sequentially explaining the operation of the mesh brewing machine when extracting grounds are discharged to the front when selling coffee, and shows the supply state of raw materials and hot water to the cylinder.

[0168]

825 FIG. 147 is an explanatory diagram for sequentially explaining the operation of the mesh brewing machine when extracting grounds are discharged to the front during coffee sales, and shows the supply state of hot water after being supplied to the cylinder.

[0169]

831 Fig. 148 is an explanatory diagram following Fig. 147 and shows a state in which the cylinder head is advanced and located directly above the cylinder.

[0170]

836 Fig. 149 is an explanatory diagram following Fig. 148, showing a state in which the cylinder head seals the upper surface of the cylinder.

[0171]

841 FIG. 150 is an explanatory diagram following FIG. 149, showing a state in which the sealing of the upper surface of the cylinder by the cylinder head is released after the coffee delivery is completed.

[0172]

846 Fig. 151 is an explanatory diagram following Fig. 150, showing a state in which the cylinder head is retracted and returned to the standby position, and flushing hot water is injected into the open cylinder for the first time.

[0173]

852 Fig. 152 is an explanatory diagram following Fig. 151, showing a state in which the filter block is lowered and flushing hot water is injected into the cylinder for the second time.

[0174]

857 Fig. 153 is an explanatory diagram following Fig. 152 and shows a state in which the extraction residue is discharged forward by a scraper.

[0175]

862 Fig. 154 is an explanatory diagram following Fig. 153 and shows a state in which the filter block returns to the standby position.

[0176]

867 FIG. 155 is an explanatory diagram following 154 and shows a state in which the scraper returns to the standby position.

[0177]

872 FIG. 156 is an explanatory diagram for sequentially explaining the operation of the mesh brewing machine when extracting grounds are discharged to the rear when selling coffee, and shows a standby state.

[0178]

877 FIG. 157 is an explanatory diagram for sequentially explaining the operation of the mesh brewing machine

when extracting grounds are discharged to the rear when selling coffee, and shows a state in which the scraper is advanced and positioned at the front standby position.

[0179]

883 Fig. 158 is an explanatory diagram for sequentially explaining the operation of the mesh brewing machine when extracting grounds are discharged to the rear when selling coffee, and shows the supply state of raw materials and hot water to the cylinder.

[0180]

889 Fig. 159 is an explanatory diagram following Fig. 158 and corresponds to Fig. 148.

[0181]

893 Fig. 160 is an explanatory diagram following Fig. 159 and corresponds to Fig. 149.

[0182]

897 Fig. 161 is an explanatory diagram following Fig. 160 and corresponds to Fig. 150.

[0183]

901 Fig. 162 is an explanatory diagram following Fig. 161 and corresponds to Fig. 151.

[0184]

905 Fig. 163 is an explanatory diagram following Fig. 162 and corresponds to Fig. 152.

[0185]

909 Fig. 164 is an explanatory diagram following Fig. 163 and shows a state in which the extraction residue is discharged rearward by a scraper.

[0186]

914 Fig. 165 is a table showing the relationship between the rotation angles of each clamp and the cam disc in the operating state of the brewing mechanism.

[0187]

919 Fig. 166 is a diagram showing the air pump and its surroundings when the frame of the main body drive unit is

viewed from the back side.

[0188]

Fig. 167 shows the suction space dividing portion, (a) is a perspective view of the state with the sealing plate attached, and (b) is a perspective view of the state with the sealing plate removed.

[0189]

Figure 168 shows a filter, (a) is a perspective view, and (b) is an exploded perspective view.

[0190]

Fig. 169 is a cross-sectional view along line c7-c7 in Fig. 168(a).

[0191]

Figure 170 shows the filter holes (through holes) of the filter body, (a) is a partial enlarged view of the upper surface, (b) is a partial enlarged cross-sectional view, and (c) is a partial enlarged view of the lower surface.

[0192]

FIG. 171 is a partially enlarged cross-sectional view showing filter holes (through holes) of the filter body shown in FIG. 170.

[0193]

FIG. 172 is a partially enlarged cross-sectional view showing the filter holes (through holes) of the filter main body according to the modification.

[0194]

Fig. 173 is an internal front view of the cup-type vending machine equipped with a mixing bowl.

[0195]

Figure 174 is a cross-sectional side view of the mixing bowl.

[0196]

Figure 175 is a cross-sectional view along line c8-c8 in Figure 174.

[0197]

964 FIG. 176 is a side view showing the lid main body of the mixing bowl shown in FIG. 174.

[0198]

968 FIG. 177 is a diagram showing the flow of rinse hot water on the inner surface of the hydrophilized stirring container in FIG. 174.

[0199]

973 FIG. 178 is a graph showing the relationship between the amount of beverage adhering to the stirring container of FIG. 174 and the number of beverage sales.

[0200]

978 FIG. 179 is a diagram schematically showing the structure of the cooling unit shown in FIG. 1.

[0201]

982 Fig. 180 is a plan view schematically showing the structure of each device arranged in the cooling water tank.

[0202]

986 Fig. 181 is a longitudinal cross-sectional view schematically showing the structure of each device arranged in the cooling water tank.

[0203]

991 Fig. 182 is a diagram schematically showing the structure of a syrup supply mechanism of a cup-type vending machine according to an embodiment of the present invention.

[0204]

996 Fig. 183 is a perspective view showing a structural example of a gear pump type syrup pump.

[0205]

1000 Fig. 184 is a perspective view showing a structural example of a bellows pump type syrup pump.

[0206]

1004 Fig. 185 is a side cross-sectional view of the syrup pump shown in Fig. 184.

[0207]

1008 Fig. 186 is a side cross-sectional view showing the state of the syrup pump shown in Fig. 185 during a discharging operation.

[0208]

1013 Fig. 187 is a side cross-sectional view showing the state of the syrup pump shown in Fig. 186 during a suction operation.

[0209]

1018 Fig. 188 is an enlarged view of the detection unit of the standby position switch.

[0210]

1022 Fig. 189 is a diagram schematically showing the structure of the carbonator shown in Fig. 1 .

[0211]

1026 Fig. 190 is a front view schematically showing the internal structure of the carbonator.

[0212]

1030 FIG. 191 is a diagram schematically showing the structure of the drainage mechanism of the cup-type vending machine according to the embodiment of the present invention.

[0213]

1035 Fig. 192 is a perspective view showing the structure of the drain switch.

[0214]

1039 Fig. 193 is a diagram schematically showing the structure of a drainage mechanism according to a modified example.

[0215]

1044 Figure 194 is a perspective view of the outlet mechanism.

[0216]

1048 Fig. 195 is a partial cross-sectional perspective view of the outlet mechanism as viewed from the back.

[0217]

1052 Figure 196 is a perspective view of the outlet mechanism as viewed from the back, with the outlet door in an open state.

[0218]

1057 Figure 197 is a cross-sectional front view of the outlet mechanism.

[0219]

1061 Fig. 198 is a partial cross-sectional perspective view of the manual outlet mechanism as viewed from the back.

[0220]

1065 Figure 199 is an internal front view of a medium-sized cup-type vending machine.

[0221]

1069 Figure 200 is an internal top view of a medium-sized cup-type vending machine.

[0222]

1073 Figure 201 is an internal plan view of a small cup-type vending machine.

[0223]

1077 Figure 202 is an internal front view of the compact cup vending machine.

[0224]

1081 Fig. 203 is an internal top view of the compact cup-type vending machine.

[0225]

1085 Figure 204 is an internal front view of the ultra-compact cup-type vending machine.

[0226]

1089 Figure 205 is an internal top view of the ultra-small cup-type vending machine.

[0227]

1093 Explanation of reference signs

[0228]

1097 1. 1LA, 1LB: cup vending machine; 1-1: medium cup vending machine; 1-2: small cup vending machine; 1-3: compact cup vending machine; 1-4: Ultra-small cup-type vending machine; 2: Equipment shell; 3: Front surface door; 4: Extraction outlet; 5: Door gasket; A: Drainage mechanism; A1: Drainage container; A10: Drainage tray; A11: Drainage passage ; A2: Drainage switch; A3: Drainage pan; A4: Electrode switch; A5: Installation table; A6: Micro switch; A6a: Detection piece; A7: Float; A8: Wire; A9: Bottom panel; B: Chlorine generation B10: chlorine generator control box; B14: DC power supply; B15: power control unit; B18: chlorine generating electrode; B18a: electrode plate; B19: chlorine generating electrode; B19a: electrode plate; B20: chlorine generating electrode; B21 : Electrical insulating material; B22: Chlorine generating electrode; B23: Insulating partition wall; B4: Chlorine generating electrode; B4a: Electrode plate; B4b: Holder; B4c: Terminal; C: Cup supply mechanism; C-1: Single round Shape cup supply mechanism; C-2: Two types of round cup supply mechanism; C-3: Single type round + single type single row cup supply mechanism; C-4: Single type square cup supply mechanism; C10: Base; C11: Placing surface; C12: Return member supporting surface; C13: Return member; C13a: Main body; C13b: Rotating shaft portion; C13c: Pressing convex portion; C13d: Spring mounting portion; C13e: Torsion coil spring; C13f: Stopper ;C14: connecting hole; C15: cup row feeding port; C16: annular convex portion; C20: round cup organizer; C20′ : single row cup organizer; C21: shell; C21′ : shell; C21A: upper shell; C21B: lower shell; C21Ba: main body; C21Bb: lower ring; C22: partition plate; C23: upper ring; C24: top plate; C25: upper connection tool; C26: roller; C27: rib; C28: lower connection tool; C28a: protruding part; C28b: fitting part; C30: cup drop ring; C30a, C30b: ring housing; C31: cup separation cam; C31a: cam part; C31b: gear part; C32: ring gear; C32a: gear part; C33: driving rod; C34: upper chute; C35: lower chute; C36: cup sold out detection lever; C37: cup sold out detection switch; C38: cup drop detection sensor; C38a: light emitting element; C38b: light receiving element; C40： Driving device; C41: Motor; C42: Gear box; C43: Output shaft; C44: Driving gear; C45: Rotating body; C45a: Engagement protrusion; C46: Storage rotating member; C46a: Gear part; C46b: Fitting part; C47: sliding part; C47a: elongated hole; C47b: connecting part; C50: base; C51: mounting surface; C52: cup row feeding port; C60: square cup storage; C61: outer wall; C61a: back wall part; C61b: side wall part; C62: upper cover; C63: front surface cover; C64: stop rod; C70: driving device; C71: motor; C710: rotation driving part; C711: driving body; C711a: eccentric cam; C712: Rotating plate; C713: Support shaft; C720: Sliding mechanism part; C721A: Upper plate; C721B: Middle plate; C721C: Lower plate; C722: Right sliding part; C722a: Through part; C723: Left sliding part; C723a: Rack; C724: driving rod; C725: elongated hole; C726: force-applying mechanism; C727: horizontal rod; C728: sliding member; C728a: penetration; C729: disc spring; C730: pinion; C730a: groove; C731: Spring; C732: spring; C733: pinion; C733a: groove; C74: gear box; C80: cup row replenishing device; C81: push rod; C81a: main body; C81b: upper connecting part; C81c: lower connecting part; C81d : Bending part; C82:

Bottom guide; C82a: Guide wall; C82b: Engagement convex part; C82c: Relief groove; C82d: Hole; C83: Support rod; C83a: Main part; C83b: Upper connecting part; C83c: Lower connecting part; C83d: Bending part; C84: Bearing; CK: Sales aisle; CY: Preparatory aisle; D: Raw material supply mechanism; D-1: Powder raw material supply mechanism; D-2: Extraction raw material supply Mechanism; D10: tank; D11: container body; D11a: input port; D11b: guide rail; D12: hopper; D13: delivery part; D13a: spout; D13b: sliding hole; D14: cover; D15: locking mechanism ; D15a: sliding member; D15b: sliding guide; D15c: protrusion; D16: indicator; D17: raw material detection sensor; D17a: light-emitting element; D17b: light-receiving element; D18: wheel; D19: auger screw; D19a: protrusion Strip; D20: chute; D21: discharge port; D22: gate; D22a: supporting shaft; D23: gate opening rod; D23a: rear end; D24: tension spring; D30: gearbox; D31: screw motor; D40: Cover member; D41: First heater; D42: Second heater; D43: Sheath; D44: Heating wire; D45: Heating reference plane; D46, D47: Heater; D48: Heater; D50: Gate Opening and closing device; D51: Housing; D51a: Sliding plate; D52: Gate opening and closing lever; D52a: Support shaft; D52b: Rotation hole; D52c: Rod pin; D52d: Front end; D52e: Pressing protrusion; D53: Selection lever ; D53a: Rod part; D53b: Cam contact part; D53c: Groove part; D54: Cam device; D54a: Cam part; D54b: Gear part; D54c: Gear notch part; D54d: Cam stopper part; D54e: Rotation shaft ;D54f: rotating hole; D54g: recess; D55: driving gear; D55a: pin; D56: tension spring; D57: leaf spring; D58: driving motor; D58a: rotating shaft; E: liquid reservoir; E1: water pump; E11: reservoir body; E12: cover; E12a: water supply port; E12b: sliding part; E13: detection rod; E13a: flange; E13b: float; E14: float switch; E14a: high water level switch; E14b: low Water level switch; E16: rod cover; E16a, E16b: insertion hole; E17: rod cover; E17a, E17b: insertion part; E18: detection rod; E18a: flange; E18b: tab; E2: water filter; E20: Rod position maintaining shaft (thread); E3, E4: electromagnetic water supply valve; E30: auxiliary pump; E31: auxiliary water supply pipe; E32: water supply tank; E40: water supply line; E41: water cooling coil; E42: electromagnetic cold water valve; E43: Carbonated water supply line; E44: Electromagnetic water supply valve; E45: Electromagnetic carbonated water valve; E46: Melted water pipe; E5: Water supply pipe; F: Warm water tank; F1: Heater; F10: Hot water spray unit; F11, F: 12 hot water supply valve; F11a, F12a: hot water supply pipe; F13: discharge temperature sensor; F14: overflow pipe; F2: float; F20: lower temperature sensor; F3: sensing arm; F30: boiling prevention Thermocouple; F31: High water level switch; F32: Low water level switch; F34: Dry burning prevention thermocouple; F35: Internal insulation material; F36: External insulation material; F37: Vacuum insulation material; F38: Lower insulation material; F39: Spray Exit; F4: Support shaft; F40: Front cover; F5: Hot water supply port; F50: Upper cover; F6: Front insulation material; F60: Cleaning tools; F61: Nozzle; F62: Operating lever; G: Ice making Machine; G1: Ice supply passage; G10: Ice making section; G11: Ice making cylinder; G12: Auger; G12a: Cutting knife; G13: Refrigerant passage; G14: Reducer; G15: Drive motor; G16: Fixed knife ; G20: Ice storage part; G21: Ice storage chamber; G21a: Release outlet; G22: Connecting cylinder; G23: Rotating shaft; G24: Agitator; G25: Partitioning member; G25a: Connecting hole; G26: Detection plate; G27: ice storage detection switch; G28: opening and closing door; G29: door solenoid; G29a: return spring; G30: ice chute; G31: ice quantitative sensor; H: cup conveying mechanism; H-1: 3 Shaft-type cup conveying mechanism; H-2: Suspended cup conveying mechanism; H10: XY stage; H12: Cup holding device; H14: X-axis part; H16: Y-axis part; H160: Shell; H18: X-axis cover ; H181: table; H182L: cup baffle; H182L1: shaft; H182L2: gear; H182L3: baffle arm; H182L3a: square hole; H182L4: cup holding portion; H182L5: baffle; H182L6: arm; H182L7, H182R7: Rib; H182R: Cup baffle; H182R1: Shaft; H182R2: Gear; H182R3: Baffle arm; H182R3a: Square hole; H182R3b: Square hole; H182R4: Cup holding part; H182R5: Baffle part ; H182R6: Arm; H183: Guide piece; H184: Z-

axis drive motor; H185: Z-axis origin switch; H186: Z-axis position detection switch; H187: Z-axis guide; H188: H-axis drive arm; H189: Spring ; H190: Accessories; H190a: Claw; H190b: Projection; H2: Y-axis; H20: X-axis conveyor motor; H201: Cup holding device; H202: Track; H203: Cup conveyor motor; H204: Powder tray; H204a： Cup waste hole; H204b: Hole rim; H205: Waste cup container; H206: Cup detection sensor; H206a: Light-emitting element; H206b: Light-receiving element; H208: Slag container; H22: X-axis motor driver; H24: X-axis drive Pulley; H25: X-axis driven pulley; H26: X-axis synchronous belt; H28: X-axis adjustment thread; H30: X-axis origin sensor; H32: Anti-separation plate; H34: Y-axis cover; H36: Y-axis conveyor Motor; H38: Y-axis motor driver; H40: Y-axis driving pulley; H41: Y-axis driven pulley; H42: Y-axis timing belt; H44: Y-axis adjustment thread; H46: Y-axis origin sensor; H48: Anti- Take off the plate; H50: Y-axis locking solenoid; J: Stirring mechanism; J-1, J-2: Stirring mechanism; J10: Stirring paddle; J10a: Drive shaft; J11: Stirring paddle rotating motor; J12: Stirring paddle lifting Motor; J13: Standby height detection switch; J14: Stirring height detection sensor; J15: Stirring paddle up and down guide; J16: Hot water nozzle; J17: Coffee supply nozzle; J18: Leaf tea supply nozzle; J19: Cover; J20: Ice Block introduction chute; K: grinder; K1: shell; K10: particle size adjustment thread; K10a: worm gear; K11: hopper; K12: coarse crushing ring; K13: upper fine crushing ring; K13a,K25a: Crushing surface; K14: Gear part; K15: External thread part; K18: Crushing convex part; K18a: Upper surface; K18b: Front end surface; K18c: Recessed part; K19: Recessed part; K19a: Triangular surface; K19b: Arc surface ; K2: Main body of the grinder; K21: Raw material feeder; K21a: Rotating part; K21b: Spiral convex part; K21c: Nut; K22: Rotating shaft; K22a: Bearing; K23: Grinding machine gear; K24: Powder raw material collection/ Ejection plate; K24a: blade part; K25: lower fine crushing ring; K26: powder delivery passage; K27: passage wall ring; K27a: ejection port; K27b: spring locking part; K28: guide member; K28a: inner surface; K29: connecting spring; K3: motor; K30: ground wire; K30a: terminal; K31: drive gear; K32: intermediate gear; K36: chute; K3a: shell; K3b: connection part; K4: powder raw material supply part; K4a : Cylindrical part; K6: Stationary grinding part; K7: Rotating grinding part; L: Brewing mechanism; L1: Brewing machine; L101: Cylinder cover; L102: Scraper; L102a: Support; L102b: Scraper body; L102c : Engagement groove; L102d: Notch; L103: Frame; L103a: Upper opening; L103b: Central opening; L104: Cam drive mechanism; L105: Cylinder head/scraper drive mechanism; L106: Clamping drive mechanism; L107: Air pump ; L107a: air suction port; L108: unit cover; L109: paper guide; L109a: inclined part; L109b: bending part; L111: cover body; L112: slider; L113: cover guide rod; L114: raw material/hot water guide Component; L115: auxiliary raw material chute; L116: hot water guide receiving part; L116a: auxiliary hot water supply nozzle; L121: first electric motor; L122: gear box; L123: output gear; L124: drive engagement gear; L125: mode Switch; L125a: switch gear; L126: intermediate gear; L131: second motor; L132: gear box; L133: scraper drive; L133a: arm; L133b: engagement convex portion; L140: joint hose; L141: tube holding parts; L142: clamping body; L143: cam; L144: output gear; L145: rotating shaft; L146: driving gear; L16: beverage tube; L20: brewing machine body; L201: filter paper delivery device; L202: paper holder unit ; L203: paper drive unit; L204: frame body; L204a: guide roller; L205: paper feed roller; L205a: arc part; L205b: straight part; L205c: small arc part; L206: paper release door; L207: paper Exhausted detection rod; L207a: pivot; L207b: rod body; L207c: detection rod; L208: roller drive mechanism; L21: drip unit; L211: frame; L212: film cover; L213: side wall; L213a: opening; L213b: Engagement hole; L213c: Locking part; L215: Cover; L216: Paper roll support member; L216a: Projection; L216b: Leg; L216c: Inclined surface; L217: Preventing member; L218: Roller shaft; L22: Main body drive unit; L221: Door main body; L222: Arm; L222a: Engagement convex portion; L222b: Locking portion; L223: Roller shaft; L224: Roller; L225: Slag separation plate; L226: Spring; L228: Torsion spring

;L23: Cylinder; L231: Front pulley; L232: Rear pulley; L233: Timing belt; L234: Support shaft; L235: Driven gear; L235a: Hub; L235b: Engagement recess; L236: Gear locking mechanism; L237: locking member; L237a: ring portion; L237b: sliding portion; L238: spring; L239: locking convex portion; L24: cylinder frame; L241: housing; L241a: locking member contact portion; L242: electric motor; L243: gear box ; L243a: output shaft; L244: drive gear; L245: cam; L245a: engagement recess; L246: paper feed detection switch; L246a: operating lever; L246b: switch roller; L247: paper end detection switch; L247a: operating lever ; L247b: switch roller; L248: switching lever; L248a: fulcrum; L248b: engaging part; L249: torsion spring; L24a: cylinder receiving part; L25: handle; L26: guide part; L27: hot water guide wall; L28: Hot water diffusion convex part; L301: suction space dividing part; L302: air suction tube; L303: rib; L303a: convex part; L303b: threaded hole; L304: suction space; L305: opening; L311: closing plate; L312: Pipe mounting hole; L313: Screw; L314: Screw insertion hole; L315: Notch; L32: Filter block; L32a: Filter block tube; L34: Cylinder adapter; L35: Front surface cover; L36: Front upper cover; L37 : Rack cover; L37a: raw material input port; L37b: hot water supply port; L37c: hot gas exhaust port; L38, L39: guide roller; L40: joint hose; L41: side wall; L41a: recess; L41b: support hole; L42: back wall; L43: bottom wall; L44: side wall body; L44a, L44b: pivot; L44c: long hole; L44d: pivot; L44e: guide rail; L44f: support; L45: outer cover; L45a: long hole ; L45b: engaging convex part; L50: waste pipe; L50a: horizontal part; L51: cylinder opening and closing mechanism; L53: first cam groove; L54: second cam groove; L55: cam disk; L55a: gear part ; L55b: convex part; L56: sliding part; L56a: engaging convex part; L56b: long hole; L57: cylinder head locking member; L57a: engaging convex part; L57b: locking part; L58: waste pipe clamping member ; L58a: engaging convex portion; L58b: pressing portion; L59: compression spring; L61: outer cam portion; L61a: approach portion; L62: drive cam portion; L63: inner cam portion; L64: outer cam portion; L65: Driving cam part; L66: inner cam part; L71: connecting shaft; L72: filter; L721: filter body; L721a: mesh part; L721b: flange part; L721c: filter hole; L721d: shallow concave; L721e: straight Hole; L721f: lower surface; L721g: curved cone structure; L721h: knife edge; L722: retaining plate; L722a: support portion; L722b: hole; L722c: fixed portion; L723: fixed frame; L723a: side wall; L723b: upper wall ;L73: seal; L74: supporting member; L75: power transmission shaft; L76: gear; L76a: driven engagement gear; L8: clamping piece; L84: disassembly lever; L84a: operating part; L84b: disassembly convex part; L85: locking part; L88: supporting protrusion; L89: cam locking mechanism; L89a: locking member; L89b: spring; L8A: first air clamping part; L8B: second air clamping part; L8C: beverage clamping part; L9: conveying pipe; L90: lock release convex portion; L91: support member; L91a: base; L91b: arm; L92: holding member; L9A: first air conveying pipe; L9B: second air conveying pipe; L9C: beverage Conveyor tube; LA: paper brewing machine; LB: mesh brewing machine; LG: extraction residue; LP: filter paper; Lpr: paper roll part; LPs: core part; M: mixing bowl; M100: interior light; M11: Stirring container; M11a: inner surface; M12: cover body; M13: hot water inlet; M13a: hot water passage; M14: hot water flow down tank; M15: peripheral wall; M15a: protrusion; M16: gap; M17: raw material input port ; M18: Exhaust passage; M19: Beverage dispensing part; M19a: Spout port; M20: Stirring device; M21: Stirring motor; M22: Joint; M23: Vertical shaft; M24: Cooking stirring blade; M25: Valve blade ;N: Cooling unit; N1: Cooling water tank; N11: Solenoid valve; N12: Capillary tube; N13: Converging part; N14: Solenoid valve; N15: Expansion valve; N17: Fan; N18: Unit base; N19: Air filter; N1a: Inner surface; N2: Compressor; N21: Syrup cooling coil; N22: Stirring device; N22a: Stirring component; N22b: Motor; N23: Water delivery guide; N24: Control sensor; N3, N4: Loading and unloading mechanism; N5: condenser; N6: evaporator; N8: dryer; N9, N10: refrigerant piping; P: syrup supply mechanism; P1~P3: syrup pump; P10, P11: syrup valve; P12: electric motor; P13, P14 : Gear; P15: Pump body; P16: Piston; P17:

Bellows; P18: Body; P19: Cylinder; P20: Suction port; P20a: Check valve; P21: Discharge port; P21a: Check valve; P23: Rod ;P26: gear motor; P27: cam; P27a: recess; P28: drive pin; P29: first link arm; P30: shaft pin; P31: second link arm; P32, P33: connecting pin; P35: standby Position switch; P35a: detection part; P35b: elastic piece; P36: switch contact member; P38: motor rotation sensor; P39: fixed thread; P4~P6: syrup supply line; P7~P9: bag in box; Q: carbonic acid Carburizer; Q1: closed container; Q1: carbonated water outlet pipe; Q12: receiving plate; Q14: float switch; Q2: carbonated gas bottle; Q3: water supply connector; Q4: gas supply connector; Q5: carbonated water spray connector; Q7: Water jet nozzle; Q9: Gas piping; R: Control part; S: Exit outlet mechanism; S-1: Automatic outlet mechanism; S-2: Manual outlet mechanism; S10: Exit door; S10a: engaging piece; S12: front frame; S14: cage; S14a: bottom surface; S16: take out the door opening and closing motor; S18: damper; S20: take out the door lock solenoid; S22: take out the door Turn off the detection switch; S24a, S24b: take-out cup detection sensor; S26: take-out outlet lighting; S28: reinforcing rib; S30: protruding piece; T100: interior light; T106: dam switch; T110: exhaust fan; T116: hinge ;T118: power box; T119: slag container; T120: hinge; T122: power relay box; T126: cooling unit filter; T128: drain container switch; T130: water filter; U: operating unit; U1: operating input V: payment processing device; V1: amount display; V2: coin input port; V3: coin return lever; V4: banknote insertion port; V5: coin return port; W, W1, W2: cup; WK: sales cup Column; WY: Prepare cup column.

[0229]

1256 Detailed ways

[0230]

1279 Next, preferred embodiments of the cup-type vending machine according to the present invention will be described in detail with reference to the drawings.

[0231]

1284 <Overview of Cup Vending Machine 1>

[0232]

1288 1 to 3 illustrate an outline of the cup vending machine 1.

1289 The cup-type vending machine 1 is configured to include a control unit R, a cup supply mechanism C, a raw material supply mechanism D, a liquid reservoir E, a chlorine generator B, a warm water tank F, and an ice maker G inside the equipment housing 2. Cup conveying mechanism H, stirring mechanism J, grinder K, brewing mechanism L, mixing bowl M, cooling unit N, syrup supply mechanism P, carbonator Q, drainage mechanism A, and in front of the cup vending machine 1 The front door 3 is provided with an outlet mechanism S, an operation unit U, and a payment processing device V.

1295 The outlet mechanism S is provided at the outlet 4 provided at the center of the front door and is a mechanism for opening and closing the outlet 4.

1297 In this cup-type vending machine 1, when payment by cash or a prepaid card is confirmed by the payment

processing device V, and a beverage is selected by the operation unit U, based on the instruction from the control unit R, the above-mentioned Each mechanism operates in association with each other, and the desired beverage is provided in the state of being put in the cup W.

1301 The provided beverage can be taken out of the machine through the take-out opening mechanism S of the front door 3.

[0233]

1306 As shown in FIGS. 2 and 3, an operating unit U is provided at an easily visible and easy-to-operate position on the upper portion of the front door 3.

1308 In the operation unit U, the name, image, etc. of the provided beverage are displayed, and a corresponding operation input part U1 is provided.

1310 As the operation input unit U1, a touch panel or a button switch can be used.

1311 The outlet mechanism S is provided at a substantially central portion of the front door 3 at an easy-to-operate position.

1313 The outlet mechanism S is a part for taking out the cup W containing the beverage outside the machine.

1314 A payment processing device V is provided adjacent to the exit mechanism S.

1315 The payment processing device V is an amount display V1, a coin insertion port V2, a coin return lever V3, a banknote insertion port V4, a coin return port V5, and other parts used to exchange money with the user.

[0234]

1320 Door gaskets 5 are provided over the entire circumference of the rear peripheral portion of the front door 3.

1321 When the door is closed, the door gasket 5 elastically deforms appropriately and comes into pressure contact with the equipment case 2 to seal the gap between the door and the equipment case 2. Therefore, it can prevent foreign matter such as insects and dust. Enter the inside of the device housing 2.

[0235]

1327 Next, each mechanism unit constituting the cup-type vending machine 1 will be described in detail in order.

[0236]

1331 <Cup supply mechanism C>

[0237]

1335 The cup supply mechanism C accommodates a plurality of cups W inside the device housing 2 and supplies the cups W individually to the cup transport mechanism H each time a drink is sold.

1337 The cups W are stored in a state of forming a cup row in which a large number of cups W are stacked with their openings facing upward.

1339 As the cup supply mechanism C of the cup type vending machine 1, as shown in FIGS. 4(a) to 4(d), there are

a single type of round cup supply mechanism C-1 and two types of round cup supply mechanisms C. -2. Single type round + single type single row cup supply mechanism C-3, single type square cup supply mechanism C-4, etc. The number of cup storage parts differs depending on the number of stored cup rows and the type of cup W. supply organization.

1344 The cup W to be supplied is a general paper cup having a circular cross-section, is tapered so that its outer shape becomes smaller as it goes downward, and has a curled portion at the opening peripheral portion of the upper end.

[0238]

1350 <Single type round cup supply mechanism C-1>

[0239]

1354 The single-type round cup supply mechanism C-1 is used to accommodate and supply a large number of cups W of one type. As shown in FIGS. 5 to 7, it includes a base C10, a round cup container C20, a cup drop ring C30, Driving device C40 (see FIG. 10), cup supply control unit (not shown), etc.

1357 Among them, the circular cup container C20 stores multiple cup rows along the circumference.

1358 Hereinafter, for the sake of convenience, it is assumed that among the cup arrays stored in the circular cup container C20, the cup array stored in the supply position is called the "sale cup array WK", and the other cup arrays are called the "preparatory cup array WY".

[0240]

1364 The base C10 is made of a molded article made of synthetic resin, has a block-like appearance, is formed in a hollow shape, and has an open lower surface.

1366 As shown in FIG. 6, the base C10 has a placement surface C11 and a return member support surface C12 in its upper portion.

1368 The placement surface C11 is configured to be slightly larger than the cross section of the circular cup container C20, and is used to place the circular cup container C20 and to place the preliminary cup row WY stored in the circular cup container C20..

1371 The return member support surface C12 is provided at a predetermined position near the outer edge of the mounting surface C11 and is used to rotatably support the return member C13 described below.

[0241]

1376 A connection hole C14 for connecting the circular cup container C20 and the drive device C40 is formed in the center of the placement surface C11 and penetrates in the up-down direction.

1378 In addition, a cup row feed port C15 penetrating in the up-down direction is formed at a predetermined position of the placement surface C11.

1380 The cup row feed port C15 is used to feed the sales cup row WK to the cup drop ring C30 below, and has a diameter one circle larger than the maximum diameter of the cup W.

1382 Furthermore, a plurality of (three in the illustrated example) annular convex portions C16 are formed on the mounting surface C11. The plurality of annular convex portions C16 project slightly upward and are arranged in a concentric circle.

1385 These annular convex portions C16 are used to reduce the contact area between the placement surface C11 and the cup W arranged at the lowest level of the preliminary cup row WY, thereby reducing frictional resistance and allowing smooth transportation of the preliminary cups on the placement surface C11. Column WY.

[0242]

1392 The return member C13 is configured to be able to be engaged with or detached from the circular cup container C20, and has a main body part C13a, a rotation shaft part C13b, and a pressing convex part C13c.

1394 The main body part C13a is made of a molded article made of synthetic resin and has a block shape of a predetermined shape.

1396 The rotation shaft part C13b extends downward from the main body part C13a, and is inserted into a hole (not shown) formed to extend downward from the return member support surface C12 with enough space.

1398 The pressing convex portion C13c protrudes from the main body portion C13a toward the circular cup container C20 side.

1400 In a state where the main body portion C13a is placed on the return member support surface C12, the return member C13 can rotate about the rotation axis portion C13b.

1402 In addition, a spring mounting portion C13d protruding upward is provided on the upper surface of the main body portion C13a on the same axis as the rotation shaft portion C13b.

1404 A torsion coil spring C13e that urges the return member C13 to rotate in the counterclockwise direction is attached to the spring mounting portion C13d.

[0243]

1409 In addition, a stopper C13f is provided at a location near the return member C13 on the placement surface C11 of the base C10.

1411 The stopper C13f is in contact with the return member C13 when the return member C13 is in the standby position shown in FIGS. 5 to 7, and serves to prevent the return member C13 from further rotating in the counterclockwise direction.

[0244]

1417 The circular cup storage C20 includes a cylindrical outer shell C21 extending in the vertical direction, and a plurality of cylindrical outer shells C21 extending in the upper and lower directions inside the outer shell C21 and arranged radially around the central axis of the outer shell C21 (as shown in the figure). 5 in the example) divider plate C22.

[0245]

1424 The casing C21 has an upper casing C21A and a lower casing C21B, and is arranged in a state where the upper end of the lower casing C21B is fitted to the outside of the lower end of the upper casing C21A.

1426 An upper ring C23 having an annular shape in plan view is provided at the upper end of the upper housing C21A, and a top plate C24 is attached to the upper surface of the upper ring C23.

1428 An upper connection tool C25 that connects the inner portions of the upper ends of all the partition plates C22 is attached to the central portion of the top plate C24.

1430 In addition, the outer portions of the upper ends of all partition plates C22 are fixed to the inner peripheral surface of the upper ring C23.

[0246]

1435 The lower housing C21B has a cylindrical main body part C21Ba and a lower ring C21Bb which is provided on the lower side of the main body part C21Ba and has an annular shape in plan view.

1437 The main body part C21Ba is located above the lower ring C21Bb and is configured to be slidable upward.

1438 Therefore, when the cup row is replenished to the round cup holder C20, the main body part C21Ba of the lower housing C21B is slid upward to replenish the cup row with the lower half of the round cup holder C20 open.

[0247]

1444 As shown in FIG. 6, a plurality of rollers C26 (three in the example shown) are rotatably provided on the lower ring C21Bb at predetermined positions on the outer peripheral surface side.

1446 These rollers C26 protrude slightly downward compared to the lower end of the lower ring C21Bb.

1447 Therefore, the circular cup container C20 can rotate smoothly by rolling these rollers C26 on the placement surface C11 of the base C10.

1449 In addition, as shown in FIG. 6 and FIG. 7(b), a plurality of ribs C27 (five in the illustrated example) are provided at predetermined positions on the outer peripheral surface of the lower ring C21Bb.

1451 The rib C27 protrudes outward, extends a predetermined length in the up-down direction, and can be engaged with or disengaged from the pressing convex portion C13c of the return member C13.

1453 These ribs C27 are provided at predetermined positions respectively corresponding to the plurality of partition plates C22.

1455 Furthermore, all the partition plates C22 are fixed to the inner peripheral surface of the lower ring C21Bb via the outer portion of the lower end portion.

[0248]

1460 As mentioned above, the plurality of partition plates C22 are arranged radially in the housing C21.

1461 As shown in (b) of FIG. 7, each partition plate C22 is formed to be bent in the counterclockwise direction at the center portion in the radial direction.

1463 These partition plates C22 define a plurality of cup array accommodating portions for accommodating cup arrays inside the casing C21.

1465 Specifically, a sales lane CK for accommodating the sales cup row WK is defined at a portion facing the cup

row feed port C15 of the base C10.

1467 In a portion facing the placement surface C11 of the base C10, four preliminary cargo lanes CY for accommodating the preliminary cup rows WY are defined.

[0249]

1472 In addition, as shown in FIG. 6, the inner portions of the lower ends of all the partition plates C22 are connected by a lower connecting tool C28 of a predetermined shape.

1474 A protruding portion C28a extending downward by a predetermined length is provided at the lower portion of the lower connecting tool C28, and a fitting portion C28b of a predetermined shape is formed at the upper portion of the protruding portion C28a.

1477 These protruding portions C28a and fitting portions C28b are inserted into the connecting hole C14 of the base portion C10 with sufficient margin, and are fitted in the connecting hole C14 in a state of being inserted into a later-described container rotation member C46 located below the connecting hole C14.

[0250]

1483 The cup drop ring C30 is provided at the lower part of the base C10 and separates the bottom cup W from the sales cup row WK.

1485 This cup drop ring C30 includes upper and lower ring housings C30a and C30b formed in an annular shape in plan view, and is disposed right below the cup row feed port C15.

1487 A plurality of (six in the illustrated example) cup separation cams C31 are provided on the inner peripheral edge portion of the cup drop ring C30 so as to be rotatable about the vertical axis.

1489 As shown in FIGS. 8 and 9, the cup separation cam C31 has a spiral cam portion C31a on its respective peripheral surface and a gear portion C31b at its lower end. The cup separation cam C31 is disposed to face the inside of the cup drop ring C30.

[0251]

1495 Inside the cup drop ring C30, a ring gear C32 is rotatably provided at a location that becomes the outer periphery of each cup separation cam C31.

1497 The ring gear C32 is formed in an annular shape in a plan view, has a gear portion C32a at its inner peripheral portion, and meshes with the gear portion C31b of the cup separation cam C31 via the gear portion C32a.

1499 Although not shown explicitly in the figure, the cup separation cam C31 meshing with the gear portion C32a of the ring gear C32 is arranged so that the respective cam portions C31a face the same direction with respect to the central axis of the cup row feed port C15.

1502 The ring gear C32 is provided with a drive rod C33 at the outer peripheral portion so as to protrude toward the outside of the cup drop ring C30.

[0252]

1507 As shown in Figure 10, the cup drop ring C30 is provided with an upper chute C34 and a lower chute C35.

1508 The upper chute C34 is used to guide the sales cup row WK inserted into the cup row feed port C15 to the cup drop ring C30. The upper chute C34 is cylindrical and communicates with the cup row feed port C15.

1510 The lower groove C35 is used to guide downward the cup W separated from the sales cup row WK by the cup drop ring C30, and is configured in a cylindrical shape.

[0253]

1515 A cup sold-out detection lever C36 and a cup sold-out detection switch C37 are provided at the upper part of the upper chute C34, and a cup drop detection sensor C38 is provided at the lower part of the lower chute C35.

1518 The cup sold-out detection lever C36 protrudes from the outside of the upper chute C34 in a state of inclining forward and downward, and is rotatably supported by its upper end.

1520 Although not shown explicitly in the figure, the cup sold-out detection lever C36 is installed so that when the number of cups W stored in the sales aisle CK becomes less than a predetermined number (for example, 5) and when the number of cups W stored in the sales aisle CK is When the number of cups W exceeds the prescribed number, the inclination angle of the cup sold-out detection lever C36 is different.

1524 The cup sold-out detection switch C37 outputs a signal corresponding to the inclination angle of the cup sold-out detection lever C36 to a cup supply control unit (not shown).

1526 The cup drop detection sensor C38 outputs its detection signal to the cup supply control unit (not shown) when the cup W passes through the inside of the lower chute C35.

1528 The cup drop detection sensor C38 is configured by providing a light-emitting element C38a and a light-receiving element C38b at positions facing each other at the lower end portion of the lower groove C35.

1530 That is, the cup drop detection sensor C38 is configured to output a detection signal to the cup supply control unit (not shown) when the light emitted from the light-emitting element C38a to the light-receiving element C38b is blocked.

[0254]

1536 The drive device C40 is used to drive the circular cup container C20 and the cup drop ring C30. The drive device C40 includes a motor C41, a gear box C42, an output shaft C43, a drive gear C44, and a rotating body C45 inside the base C10.

1539 The electric motor C41 can rotate in the forward and reverse directions in accordance with instructions from a cup supply control unit (not shown).

1541 The gearbox C42 has a built-in reduction gear train and is connected to the electric motor C41.

1542 The output shaft C43 extends in the vertical direction and protrudes from the upper and lower sides of the gear box C42.

1544 The drive gear C44 is used to rotationally drive the circular cup container C20 and is connected to the upper end of the output shaft C43.

1546 This drive gear C44 is connected to the output shaft C43 via a predetermined first one-way clutch (not shown).

1548 For example, only when the electric motor C41 rotates in the forward direction and the output shaft C43 rotates clockwise, the first one-way clutch causes the drive gear C44 and the output shaft C43 to rotate

clockwise integrally.

1551 That is, when the electric motor C41 rotates in the reverse direction and the output shaft C43 rotates counterclockwise, the first one-way clutch does not transmit the rotation of the output shaft C43 to the drive gear C44.

1554 Therefore, when the output shaft C43 rotates in the counterclockwise direction, the drive gear C44 does not rotate.

1556 In addition, the drive gear C44 meshes with the gear portion C46a of the container rotation member C46 connected to the circular cup container C20.

[0255]

1561 The container rotation member C46 is rotatably supported inside the base C10 about the vertical axis, and has the above-mentioned gear portion C46a and a fitting portion C46b formed in a predetermined shape on the upper portion of the gear portion C46a.

1564 In a state where the circular cup container C20 is placed on the base C10, the fitting portion C28b of the lower connecting tool C28 provided on the circular cup container C20 and the fitting portion C46b of the container rotation member C46 are fitted into each other. The combined status link.

1567 Therefore, the container rotation member C46 rotates integrally with the circular cup container C20.

1568 When the container rotation member C46 is rotationally driven in the counterclockwise direction by the drive gear C44 that rotates in the clockwise direction, the circular cup container C20 also rotates in the counterclockwise direction.

[0256]

1574 The rotating body C45 is used to drive the cup drop ring C30 and is connected to the lower end of the output shaft C43.

1576 The rotating body C45 is formed in a disc shape having a predetermined diameter in plan view, and its center portion is connected to the output shaft C43 via a predetermined second one-way clutch (not shown).

1578 For example, only when the electric motor C41 rotates in the reverse direction and the output shaft C43 rotates counterclockwise, the second one-way clutch causes the rotating body C45 to rotate counterclockwise integrally with the output shaft C43.

1581 That is, when the electric motor C41 rotates in the forward direction and the output shaft C43 rotates clockwise, the second one-way clutch does not transmit the rotation of the output shaft C43 to the rotating body C45.

1584 Therefore, when the output shaft C43 rotates in the clockwise direction, the rotating body C45 does not rotate.

[0257]

1589 On the bottom surface of the rotating body C45, an engaging protrusion C45a protruding downward is provided near the outer edge.

1591 On the lower side of the rotating body C45, a slider C47 is provided in a predetermined direction and

horizontally slidable near the outer edge of the cup drop ring C30.

1593 An elongated hole C47a is formed in the slider C47.

1594 The engaging protrusion C45a of the rotary body C45 is slidably engaged with the elongated hole C47a of the slider C47.

1596 In addition, the slider C47 is provided with a connection portion C47b.

1597 The connection portion C47b extends downward from the slider C47 and is connected to the drive rod C33 provided at the ring gear C32 of the cup drop ring C30.

[0258]

1602 In this driving device C40, when the rotating body C45 rotates once, the slider C47 slides so as to reciprocate in the outer circumferential direction of the cup drop ring C30.

1604 When the slider C47 reciprocates, the ring gear C32 reciprocates, and accordingly, the plurality of cup separation cams C31 reciprocate within a predetermined angle range synchronously.

1606 Thereby, as shown in FIG. 11, the cup W1 arrange|positioned at the bottom of the sales cup row WK is separated.

1608 That is, as shown in FIG. 11(a), the curled portion of the upper end of the cup W1 of the sales cup row WK is placed on the upper end of the cup separation cam C31, so that the cup W of the sales cup row WK is not It will fall downward and be stored in the sales aisle CK of the round cup storage device C20.

1611 When the cup separation cam C31 rotates from this state, as shown in FIGS. 11(b) and 11(c), the lowermost cup W1 is pressed downward by the action of the cam portion C31a formed in a spiral shape. It is separated from the sales cup row WK and falls downward from the cup row feeding port C15.

1614 At the same time, the curled portion of the cup W2 stacked on the lowermost layer comes into contact with the cup separation cam C31, and the state of FIG. 11(a) is restored.

1616 Thereafter, the above-mentioned operation is repeated to cause the cups W stacked in the sales cup row WK to fall downward one by one.

[0259]

1621 Next, the operation of the above-described single-type round cup supply mechanism C-1 will be described with reference to FIGS. 12 to 14.

1623 (a) of FIG. 12 shows a state in which the sales cup row WK is stored in the sales lane CK of the circular cup storage device C20, and the reserve cup rows WY are stored in each of the four reserve lanes CY.

1625 The sales cup row WK of the sales aisle CK is in a state of penetrating the cup row feeding port C15 and being inserted into the inside of the cup drop ring C30.

1627 Each of the reserve cup rows WY in the reserve lane CY is placed on the placement surface C11 with the lowermost cup W in the rack.

[0260]

1632 From this state, when a sales instruction is provided to the control unit R of the cup vending machine 1 by, for example, the user pressing a selection button, a cup supply instruction is provided from the control unit

R to a cup supply control unit (not shown).

1635 When a cup supply command is given to the cup supply control unit (not shown), the motor C41 of the driving device C40 rotates in the reverse direction, and the rotating body C45 rotates once, thereby driving the cup drop ring C30.

1638 Thereby, the cup W1 of the lowest stage is separated from the sales cup row WK, and is supplied downward via the downward chute C35.

1640 At this time, although the output shaft C43 of the drive device C40 rotates in the counterclockwise direction due to the reverse rotation of the electric motor C41, the power transmission is canceled by the first one-way clutch and the drive gear C44 does not rotate.

1643 Therefore, the container rotation member C46 meshed with the drive gear C44 does not rotate, and the circular cup container C20 connected via the lower connecting tool C28 does not rotate either.

[0261]

1648 The cup drop detection sensor C38 detects whether the cup W separated from the sales cup row WK has passed the lower end of the lower chute C35.

1650 When the cup drop detection sensor C38 detects the passage of the cup W, it is determined that the cup W has been supplied normally, and the next cup supply command is awaited.

1652 On the other hand, when an abnormality occurs such as the cup W is clogged midway and the cup drop detection sensor C38 does not confirm the passage of the cup W, for example, the cup supply control unit (not shown) notifies that the abnormality has occurred and the sale of the beverage is suspended..

[0262]

1658 When the number of cups W in the sales cup row WK decreases and there is no longer a cup W above the cup row feed port C15 of the base C10 in the sales cup row WK as shown in FIG. 12(b), the cup sales The empty detection switch C37 detects this situation and supplies its detection signal to the cup supply control unit (not shown).

1662 When the detection signal is supplied from the cup sold-out detection switch C37, the motor C41 of the driving device C40 rotates in the forward direction according to the instruction from the cup supply control unit (not shown), and the circular cup container C20 is rotated in the counterclockwise direction. Perform rotational drive.

1666 At this time, although the output shaft C43 of the drive device C40 rotates clockwise due to the forward rotation of the electric motor C41, the power transmission is canceled by the second one-way clutch and the rotating body C45 does not rotate.

1669 Therefore, the cup W of the sales cup row WK is not separated by the cup drop ring C30.

[0263]

1673 (c) of FIG. 12 shows a state in which the circular cup holder C20 starts to rotate in the counterclockwise direction.

1675 When the circular cup container C20 rotates, the rib C27 originally located near the pressing convex part

C13c of the return member C13 engages with the pressing convex part C13c and presses it.

1677 Thereby, the return member C13 rotates clockwise against the biasing force of the torsion coil spring C13e.

[0264]

1681 When the circular cup container C20 further rotates in the counterclockwise direction from this state, as shown in (a) of FIG. Disengage and the engagement is released.

1683 Thereby, the return member C13 rotates in the counterclockwise direction by the biasing force of the torsion coil spring C13e, comes into contact with the stopper C13f, and returns to the original standby position.

1685 When the round cup container C20 further rotates in the counterclockwise direction, the preliminary cup row WY is transported through each partition plate C22, and the preliminary cup row WY originally located immediately before the sales aisle CK reaches the cup row at the base C10. On mouth C15.

1688 Thereafter, the preliminary cup row WY that has reached the cup row feed port C15 is dropped through the cup row feed port C15 as shown in FIG. Sales cup column WK.

[0265]

1693 In this case, when the cup sold-out detection switch C37 detects that the number of cups W in the sold cup row WK has exceeded the predetermined number, the motor C41 of the drive device C40 stops and the circular cup container C20 that originally rotates also stops.

1696 Thereby, placement of the preliminary cup row WY in the cup row feed port C15 is completed.

1697 Thereafter, sales are started and when the number of cups W in the sold cup row WK becomes less than a predetermined number, other preliminary cup rows WY are sequentially transported to the cup row feed port C15 side and placed there, similarly to the above.

[0266]

1703 (a) of FIG. 14 shows a state in which the circular cup container C20 is slightly excessively rotated in the counterclockwise direction with respect to the appropriate stop position, and the sales cup row WK placed in the cup row feeding port C15 is divided. The partition C22 is pressed against the upper chute C34 and so on.

1707 In this case, like FIG. 12(c) , the rib C27 engages with and presses the pressing convex portion C13c of the return member C13, so that the return member C13 moves in the clockwise direction against the biasing force of the torsion coil spring C13e. Rotate.

[0267]

1713 When the sales cup row WK is pressed against the upper chute C34 by the partition plate C22, the sales cup row WK may be suspended, and the sales cup row WK cannot be sent to the lower cup drop ring via the cup row feeding port C15. C30.

1716 However, according to the above-mentioned single type round cup supply mechanism C-1, in order to separate the bottom cup W1 from the sales cup row WK during sales, the motor C41 of the drive device C40

rotates in the reverse direction and the output shaft C43 rotates counterclockwise. When rotating in the opposite direction, the first one-way clutch allows the drive gear C44 to rotate counterclockwise relative to the output shaft C43.

1721 Thereby, the container rotation member C46 meshed with the drive gear C44 is also allowed to rotate in the clockwise direction.

1723 That is, when the cup drop ring C30 is driven, the circular cup container C20 connected to the container rotating member C46 via the lower connecting tool C28 can rotate clockwise in a no-load state.

[0268]

1728 Therefore, in the state shown in FIG. 14(a), when the cup drop ring C30 is driven by the motor C41 to rotate in the reverse direction, the return member C13 is rotated in the counterclockwise direction by the biasing force of the torsion coil spring C13e. The pressing convex portion C13c presses the engaged rib C27.

1731 Thereby, as shown in FIG. 14(b), the circular cup container C20 rotates slightly in the clockwise direction and returns to a predetermined appropriate position, and the pressing state of the sales cup row WK by the partition plate C22 is eliminated.

[0269]

1737 As described in detail above, according to this single type round cup supply mechanism C-1, even in a state where the sales cup row WK is pressed by the partition plate C22, the return member C13 can make the round cup The cup holder C20 returns to a predetermined appropriate position, thereby eliminating the above-mentioned pressed state of the sales cup row WK.

1741 In addition, since the operator who replenishes the cups W to the round cup holder C20 touches the round cup holder C20 etc. after the operation, the sales cup row WK located in the cup row feed port C15 placed in the base C10 is divided. Even when the partition plate C22 is in a pressed state, the pressed state of the sales cup row WK can be eliminated by the return member C13.

1745 As described above, according to the above-described single-type round cup supply mechanism C-1, the state in which the sales cup row WK is pressed by the partition plate C22 can be reliably eliminated, and stable supply of the cups W can be ensured.

[0270]

1751 <Two types of round cup supply mechanisms C-2>

[0271]

1755 The two types of round cup supply mechanisms C-2 can respectively accommodate and supply a large number of cups W of two types with different sizes. As shown in FIGS. 15 and 16, the two types of round cup supply mechanisms C-2 are configured to Two circular cup storage containers C20 are provided on the base C10.

1759 Each round cup holder C20 has the same structure as the round cup holder shown in the single round cup

supply mechanism C-1.

1761 On the other hand, the base C10 is provided with an independent cup drop ring C30 and a driving device C40 for each circular cup container C20.

1763 Regarding the cup supply control unit (not shown), an independent cup supply control unit may be provided for each round cup holder C20, or a common cup supply control unit may be provided for the two round cup holders C20 (not shown). icon).

[0272]

1769 In the two types of round cup supply mechanisms C-2, when the user presses the selection button to provide a sales instruction to the control unit R of the cup vending machine 1, cups are supplied from the control unit R. A control unit (not shown) provides cup supply instructions.

1772 For example, when an independent cup supply control unit (not shown) is provided for each round cup container C20, based on the information about the size of the cup W included in the sales instruction, the control unit R controls the size of the cup W contained therein. The cup supply control unit (not shown) of the circular cup storage device C20 corresponding to the cup W of the appropriate size provides a cup supply instruction.

[0273]

1780 On the other hand, when a common cup supply control unit (not shown) is provided for the two round cup holders C20, the cup supply command provided from the control unit R only needs to include the cup W to be supplied. Information about size is enough.

1783 The cup supply control unit (not shown) to which the cup supply instruction is provided targets the circular cup container C20 that stores the cup W of the appropriate size based on the information on the size of the cup W included in the cup supply instruction. Implement cup W supply operation.

[0274]

1789 As described above, according to the cup vending machine 1 provided with the two types of round cup supply mechanisms C-2, drinks can be provided using two types of cups W having different sizes.

1791 In addition, since the supply operation of the cup W performed by each round cup container C20 is the same as the supply operation demonstrated in the single round cup supply mechanism C-1, the detailed description is abbreviate|omitted.

1794 In addition, it is not necessarily necessary to store cups W of different sizes in the two round cup holders C20, and cups W of the same size may be stored in each round cup holder C20 for use.

[0275]

1799 <Single type round + single type single row cup supply mechanism C-3>

[0276]

1803 As shown in Figures 17 and 18, the single type round + single type single-row cup supply mechanism C-3 is a round cup storage unit C20 of the above-mentioned two round cup supply mechanisms C-2 that becomes a single row cup storage unit. Made of C20′ .

1806 The single-row cup storage device C20' constitutes a sales aisle CK for accommodating only the sales cup row WK inside a rectangular cylindrical casing C21' extending in the up-and-down direction.

1808 The base C10 is provided with an independent cup drop ring C30 and a driving device C40 for the circular cup container C20 and the single-row cup container C20'.

1810 Regarding the cup supply control unit (not shown), an independent cup supply control unit may be provided for the circular cup container C20 and the single-row cup container C20', or it may be provided for the circular cup container C20 and the single-row cup container C20. 'A common cup supply control unit (not shown) is provided.

[0277]

1817 In this single-type round + single-type single-row cup supply mechanism C-3, when the user presses the selection button to provide a sales instruction to the control unit R of the cup-type vending machine 1, the control unit R provides a cup supply instruction to a cup supply control unit (not shown).

1820 For example, in the case where independent cup supply control units (not shown) are provided for the round cup holder C20 and the single-row cup holder C20', based on the information about the size of the cup W included in the sales instruction, from The control unit R provides a cup supply instruction to the cup supply control unit (not shown) of the circular cup container C20 and the single-row cup container C20' that accommodate cups W of appropriate sizes.

[0278]

1828 On the other hand, when a common cup supply control unit (not shown) is provided for the circular cup container C20 and the single-row cup container C20', the cup supply command provided from the control unit R only needs to include Just provide information about the size of the cup W.

1831 The cup supply control unit (not shown) to which the cup supply instruction is provided targets the cup storage containers C20 and C20' that accommodate the cups W of the corresponding size based on the information on the size of the cup W included in the cup supply instruction. To implement the cup W supply action.

[0279]

1838 As described above, according to the cup-type vending machine 1 provided with the single-type round + single-type single-row cup supply mechanism C-3, drinks can be provided using two types of cups W with different sizes.

1841 In addition, the supply operation of the cups W performed by the respective cup holders C20 and C20' is the same as the supply operation described in the single-type round cup supply mechanism C-1, and therefore detailed descriptions thereof are omitted.

1844 However, since the single-row cup container C20' stores only the sales cup row WK inside, supply of the cups W ends when the cup sold-out detection switch detects the sold-out of the cups W.

1846 Therefore, it is preferable to notify that there is no cup W inside the single-row cup holder C20'.

1847 In addition, the circular cup container C20 and the single-row cup container C20' do not necessarily store cups W of different sizes, and cups W of the same size can be stored in each cup container for use.

[0280]

1852 <Single type square cup supply mechanism C-4>

[0281]

1856 The single-type square cup supply mechanism C-4, like the single-type round cup supply mechanism C-1, accommodates and supplies a large number of cups W of one type. As shown in FIGS. 19 to 21, the single-type square cup supply mechanism C-4 The mechanism C-4 includes a base C50, a square cup container C60, a cup drop ring C30, a driving device C70 (see FIG. 23), a cup supply control unit (not shown), and the like.

1861 Among them, the square cup storage device C60 stores a plurality of cup rows in one row along a straight line.

1863 In the example shown in the figure, it is configured in a size capable of accommodating three rows of cups.

[0282]

1867 The placement surface C51 of the base C50 is configured to be slightly larger than the cross section of the square cup container C60, and has a cup row feed port C52 in the center.

1869 That is, in this single type square cup supply mechanism C-4, the sales lane CK for storing the sales cup row WK is defined in the central part of the square cup container C60, and the sales lane CK for storing the reserve cups is defined on both sides. List WY's prepared cargo lane CY.

1872 The cup drop ring C30 arranged inside the cup row feed port C52 has the same structure as the cup drop ring of the single type circular cup supply mechanism C-1.

[0283]

1877 The square cup container C60 has an outer wall C61 formed by bending a metal plate of a predetermined shape or the like.

1879 The outer wall C61 has a back wall portion C61a with a vertically long rectangular front shape and side wall portions C61b that are bent at right angles from the left and right ends of the back wall portion C61a and extend forward. The outer wall C61 is formed to open forward when viewed from above. U-shaped.

1882 An upper cover C62 is attached to the outer wall C61 so as to cover the top portion and the upper portion of the front surface.

1884 A front cover C63 made of a transparent sheet is attached to the upper cover C62 so as to hang down from the lower end portion of the front surface.

1886 The front cover C63 can be rolled up to open the front surface of the square cup holder C60, and the cup row can be stored in the state.

[0284]

1891 In addition, a stopper rod C64 and a cup row replenishing device C80 are provided inside the square cup container C60.

1893 The stopper rod C64 limits the upper limit height of the cup row stored in the square cup container C60 and functions as a stopper for the support rod C83 described later. The stopper rod C64 is provided between the left and right side wall portions C61b Extend horizontally.

1896 The cup array replenishing device C80 is used to move the reserve cup array W Y stored in any of the reserve aisles C Y to the sales aisle when the number of cups W stored in the sales aisle C K becomes less than a predetermined number (for example, 5 pieces). Road C K, the cup row replenishing device C80 is set to be symmetrical.

1900 Next, the cup row replenishing device C80 will be described focusing on the cup row replenishing device on the right side.

[0285]

1905 As shown in FIGS. 19 and 21 , the cup row replenishing device C80 includes a push rod C81, a bottom guide C82, and a support rod C83.

[0286]

1910 The push rod C81 presses the preliminary cup row W Y toward the sales aisle C K to move the preliminary cup row W Y. The push rod C81 is formed into a predetermined shape by bending a metal rod or the like.

1912 Specifically, it has a main body part C81a extending in the up and down direction, and an upper connection part C81b and a lower connection part C81c that are bent at right angles from the upper end part and the lower end part of the main body part C81a and then extend horizontally rearward in parallel with each other, and are formed as follows U-shaped.

1916 With respect to the stopper rod C64 in the square cup container C60, the push rod C81 is arranged so that the main body part C81a is located on the front side and the upper connection part C81b is located on the upper side.

[0287]

1922 The main body portion C81a has a length that is slightly shorter than the distance between the placement surface C51 of the base portion C50 and the top surface of the upper cover C62.

1924 Moreover, the upper connection part C81b has a predetermined length, the top end part is bent upward at a right angle, and is rotatably supported by the bearing C84 attached to the upper cover C62.

1926 On the other hand, the lower connecting portion C81c has the same length as the upper connecting portion C81b, and is provided with a bent portion C81d that is bent downward at a right angle and then extends at

its top end.

1929 This bent portion C81d penetrates the base C50 at a position slightly rearward of the portion where the preliminary cup row WY is placed, and is connected to the driving device C70 in the base C50.

1931 The push rod C81 configured as above rotates between the standby position and the replenishing position with the vertical axis passing through the tip portions of the upper connecting portion C81b and the lower connecting portion C81c as the center, specifically with the bent portion C81d as the center. Among them, the standby position is the position when the main body C81a is on the side of the reserve aisle CY (the position shown in Figures 19 to 21, etc.), and the replenishing position is when the main body C81a is on the side of the sales aisle CK and the reserve cup is The position when the column WY is added to the sales lane CK (the position shown in (b) of FIG. 25).

[0288]

1941 The bottom guide C82 is used to support the bottom of the preliminary cup array WY and guide the preliminary cup array WY to the sales aisle CK while maintaining the posture of the preliminary cup array WY. The bottom guide C82 is provided at the rear of the base C50. The front side faces the mounting surface C51 and is arranged below the lower connecting portion C81c of the push rod C81.

1945 This bottom guide C82 is a molded product made of plastic, and is formed into a shape with a central portion bent as shown in FIG. 22.

1947 The inner surface of the bottom guide C82 is formed in an arc shape, and its curvature is slightly larger than the bottom of the cup W and smaller than the opening of the cup W.

1949 In addition, a guide wall portion C82a is provided on the left half of the bottom guide C82.

1950 The guide wall portion C82a is formed higher than the right half of the bottom guide C82.

1951 On the other hand, the right half of the bottom guide C82 is provided with an engaging convex portion C82b protruding upward at its top end.

1953 The engaging convex portion C82b is located on the right side of the lower connecting portion C81c of the push rod C81 and has a height that can abut the lower connecting portion C81c from the right.

1955 In addition, a U-shaped relief groove C82c open to the rear in plan view is formed in the center of the bottom guide C82. This relief groove C82c prevents the bottom guide C82 from interfering with the bent portion C81d of the push rod C81.

1958 Furthermore, in the bottom guide C82, a hole C82d penetrating in the up-down direction is formed on the left side of the relief groove C82c.

1960 The hole C82d is penetrated by a bent portion C83d extending downward from the top end portion of the lower connecting portion C83c of the support rod C83 described later.

1962 Therefore, the bottom guide C82 is rotatable around the bent portion C83d.

[0289]

1966 The support rod C83 is used to support the preliminary cup row WY from the sales aisle CK side, thereby maintaining the posture of the preliminary cup row WY. The support rod C83 is substantially the same as the push rod C81, and has a main body part C83a, an upper connection part C83b, and a lower connection part. C83c and bent portion C83d.

1970 In addition, this support rod C83 is located on the rear side of the stopper rod C64 provided inside the square cup container C60.

[0290]

1975 The main body part C83a has substantially the same length as the main body part C81a of the push rod C81. On the other hand, the upper connection part C83b and the lower connection part C83c are shorter than the upper connection part C81b and the lower connection part C81c of the push rod C81.

1978 In addition, the top end portion of the upper connection portion C83b is bent upward at a right angle, and the upper connection portion C83b is rotatably supported by the bearing C84 at a position slightly offset to the left from the top end portion of the upper connection portion C81b of the push rod C81.

1981 A spring (not shown) is built into the bearing C84, and the spring is used to bias the support rod C83 in the counterclockwise direction in FIG. 21.

1983 On the other hand, the lower connection portion C83c is located on the back side of the guide wall portion C82a of the bottom guide C82.

1985 The bent portion C83d bent downward from the front end portion of the lower connecting portion C83c is rotatably supported on the base C50 in a state of penetrating the hole of the bottom guide C82.

[0291]

1990 The support rod C83 configured as above is rotatable about the vertical axis passing through the tip portions of the upper connecting portion C83b and the lower connecting portion C83c, specifically about the bent portion C83d.

1993 In addition, as shown in FIGS. 19 and 21, the main body portion C83 a of the support rod C83 in the standby state is located between the sales lane CK and the reserve lane CY, close to the stopper rod C64 and the sales cup row WK.

1996 More specifically, the main body portion C83a of the support rod C83 in the standby state is located on the rear side of the stopper rod C64 and on the oblique rear side of the sales cup row WK.

1998 In addition, as will be described later, when the reserve cup row WY is replenished in the sales aisle CK, the main body portion C83a is pressed against the reserve cup row WY, so that the support rod C83 on the right side moves along the figure with the bent portion C83d as the center. 21 rotates clockwise, and the support rod C83 on the left rotates counterclockwise.

[0292]

2005 In addition, the left and right support rods C83 also play a role in preventing the sales cup row WK stored in the sales aisle CK from tilting in the left and right directions.

2007 For example, even if the sales cup row WK is tilted to the right and comes into contact with the right support rod C83 so that the support rod C83 rotates in the counterclockwise direction, the support rod C83 comes into contact with the stopper rod C64. Its further rotation is thereby prevented.

2010 The same applies to the support rod C83 on the left side.

2011 In this way, the sales cup row WK is prevented from tilting in the left and right direction by the left and right

support rods C83, so the sales cup row WK can be stably maintained in a vertical posture.

2013 Therefore, it is possible to avoid malfunctions caused by mutual interference between the sales cup row WK and the backup cup row WY, such as a supply failure of the sales cup row WK, thereby ensuring a stable supply of cups W.

[0293]

2019 FIG. 23 shows the driving device C70 that drives the cup drop ring C30 and the left and right cup row replenishing devices C80.

2021 The driving device C70 has an electric motor C71 as a driving source, and is provided with a rotational driving part C710 that mainly performs a rotational operation by being driven by the electric motor C71, and a sliding mechanism part C720 that is rotated by the electric motor C71. The driving part C710 is driven to perform a sliding operation in the left and right directions.

[0294]

2028 The rotation driving part C710 has a driving body C711 and three rotating plates C712. The driving body C711 is driven by the motor C71 via the gear box C74, thereby rotating and lifting. By the rotation of the driving body C711, the three rotating plates C712 are rotated. One is driven by rotation.

2031 The driving body C711 has an eccentric cam C711a that is circular in plan view.

2032 Although description of the detailed structure of the driving body C711 is omitted, when the motor C71 rotates in a predetermined direction, the driving body C711 rotates in the counterclockwise direction in FIG. 23(b), thereby causing the eccentric cam C711a to move up and down.

2035 On the other hand, when the motor C71 rotates in the opposite direction to the above-mentioned direction, the driving body C711 rotates in the clockwise direction, and accordingly, the eccentric cam C711a also rotates in the clockwise direction.

[0295]

2041 The three rotating plates C712 are provided to correspond to the three sliding plates C721A, C721B, and C721C of the sliding mechanism part C720, which will be described later.

2043 These rotating plates C712 are identical to each other, are formed in a predetermined shape extending in the front-rear direction, and are arranged to be stacked on each other.

2045 In addition, each rotating plate C712 is penetrated by a spindle C713 extending upward from the lower part of the base part C50 at its front end part, and is rotatable around the spindle C713.

[0296]

2050 The sliding mechanism part C720 is provided with three sliding plates C721A, C721B, and C721C that extend in the left-right direction and are arranged to be stacked on each other. The upper sliding plate (hereinafter referred to as the "upper plate C721A") is engaged with and is used to drive the right side. The right slider C722 of the push rod C81 of the side cup row replenishing device C80; and the push rod C722

that engages with the middle layer sliding plate (hereinafter referred to as "middle layer plate C721B") and is used to drive the left cup row replenishing device C80. The left slider C723 of rod C81, etc.

2056 In addition, the lower sliding plate (hereinafter referred to as "lower plate C721C") is used to drive the cup drop ring C30, and the drive rod C724 extending downward is connected to the ring gear C32 of the cup drop ring C30.

[0297]

2062 The upper, middle and lower panels C721A, C721B and C721C each have a long hole C725 that penetrates in the up and down direction and extends a predetermined length in the left and right direction. The long hole C725 is biased to the left by the force applying mechanism C726.

2065 The force applying mechanism C726 includes a horizontal rod C727 arranged above the upper plate C721A so as to extend horizontally in the left-right direction and supported inside the base C50; and a slider C728 provided along the horizontal rod. C727 slides freely; and the coil spring C729 is installed on the horizontal rod C727 and exerts force on the sliding member C728 to the left.

2069 The slider C728 is provided with a penetration portion C728a extending downward and penetrating the elongated hole C725 of the upper, middle, and lower plates C721A, C721B, and C721C.

2071 In the standby state shown in FIG. 23, the penetration portion C728a of the slider C728 is located near the left inner wall of the elongated hole C725.

[0298]

2076 The right slider C722 is formed in a predetermined shape extending in the left-right direction, and has a penetration portion C722a extending a predetermined length in the left-right direction at the right end of the upper surface.

2079 Further, on the upper side of the right slider C722, a pinion gear C730 meshed with the above-mentioned through portion C722a is provided, and the pinion gear C730 is provided rotatably about the vertical axis.

2081 A groove C730a that opens upward and has a cross shape in plan view is provided in the upper portion of the pinion gear C730.

2083 Furthermore, the bent portion C81d of the push rod C81 of the right cup row replenishing device C80 is fixed in a state of fitting into the groove C730a.

2085 In addition, a spring C731 is provided inside the right slider C722, and the spring C731 biases the right slider C722 to the left.

2087 Accordingly, the pinion gear C730 is biased in the counterclockwise direction. Therefore, the push rod C81 fixed to the pinion gear C730 is normally biased in the counterclockwise direction.

[0299]

2092 On the other hand, the left slider C723 is formed in a predetermined shape extending in the left-right direction, is symmetrical to the right slider C722 in the front-rear and left-right directions, and has a rack C723a at the left end of the upper surface.

2095 The rack C723a meshes with the pinion C733, and the bent portion C81d of the push rod C81 of the left cup

row replenishing device C80 is fixed in a state of fitting into the cross-shaped groove C733a.

2097 In addition, like the right slider C722, the left slider C723 is biased to the left by the spring C732 provided inside the left slider C723.

2099 Thereby, the pinion gear C733 is biased in the clockwise direction, and therefore the push rod C81 fixed to the left side of the pinion gear C733 is also biased in the clockwise direction.

[0300]

2104 Here, the operation of the drive device C70 configured as above will be described.

2105 When the motor C71 operates and rotates in a predetermined direction, the driving body C711 rotates in the counterclockwise direction, thereby causing the eccentric cam C711a to move up and down.

[0301]

2110 For example, when the cup drop ring C30 is driven, the eccentric cam C711a stops at the same height as the lower rotating plate C712.

2112 After that, the motor C71 rotates in the opposite direction to the above-mentioned direction, so that the driving body C711 rotates one turn in the clockwise direction, and accordingly, the eccentric cam C711a also rotates one turn in the same direction.

2115 In this case, the eccentric cam C711a presses the lower rotating plate C712 to the right, thereby rotating the rotating plate C712 in the clockwise direction about the support shaft C713, and presses the lower layer to the right against the urging force of the urging mechanism C726. Board C721C.

2118 Thereby, the lower board C721C slides to the right.

2119 At this time, the penetration portion C728a of the slider C728 of the biasing mechanism C726 is pressed by the left inner wall of the elongated hole C725 of the lower plate C721C, and the slider C728 slides to the right.

2122 In addition, when the rotation of the eccentric cam C711a exceeds half a turn, the lower plate C721C that originally slid to the right is pressed by the slider C728 of the urging mechanism C726 via its long hole C725, thereby sliding to the left and returning to the original position.

2125 This reciprocating movement of the lower plate C721C in the left-right direction causes the ring gear C32 of the cup drop ring C30 to reciprocate in the circumferential direction.

2127 Thereby, all the cup separation cams C31 synchronously rotate in a predetermined direction by a predetermined angle and then rotate in the reverse direction and return to the original position.

2129 As described above, the cup drop ring C30 is driven, whereby the bottom cup W1 is separated from the sales cup row WK and transported downward.

[0302]

2134 When the cup row replenishing device C80 on the right side is driven, the eccentric cam C711a moves up and down and stops at the same height as the upper rotating plate C712.

2136 Thereafter, as in the case of driving the cup drop ring C30, the eccentric cam C711a rotates once, whereby the upper rotating plate C712 presses the upper plate C721A rightward against the urging force of the urging

mechanism C726.

2139 Thereby, the upper plate C721A slides to the right, and the right slider C722 is pressed against the biasing force of the spring C731, so that the right slider C722 slides to the right.

2141 In this way, the right slider C722 slides to the right, thereby causing the pinion gear C730 meshed with the penetration portion C722a to rotate clockwise by a predetermined angle.

2143 In addition, when the rotation of the eccentric cam C711a exceeds half a turn, the upper plate C721A is pressed by the slider C728 of the urging mechanism C726, thereby sliding to the left and returning to the original position.

2146 Subsequently, the right slider C722 slides to the left by the biasing force of the spring C731 and returns to the original position, and the pinion gear C730 rotates in the counterclockwise direction and returns to the original position.

2149 This reciprocating movement of the right slider C722 in the left-right direction causes the pinion gear C730 to reciprocate in the circumferential direction.

2151 Thereby, the push rod C81 of the right cup row replenishing device C80 rotates from the standby position to the replenishing position, and then rotates in the reverse direction and returns to the standby position.

2153 That is, the push rod C81 uses the power of the motor C71 to rotate from the standby position to the replenishing position, and uses the biasing force of the spring C731 to perform return rotation from the replenishing position to the standby position.

2156 As described above, the cup row replenishing device C80 on the right side is driven, whereby the reserve cup row WY in the right reserve lane CY is replenished to the sales lane CK.

[0303]

2161 Furthermore, when the left cup row replenishing device C80 is driven, the eccentric cam C711a moves up and down and stops at the same height as the middle rotating plate C712.

2163 Thereafter, similarly to the above-mentioned case, the eccentric cam C711a rotates once, thereby pressing the middle layer plate C721B to the right against the biasing force of the biasing mechanism C726 via the rotating plate C712 of the middle layer.

2166 Thereby, the middle plate C721B slides to the right, and the left slider C723 is pressed against the biasing force of the spring C732, so that the left slider C723 slides to the right.

2168 In this way, the left slider C723 slides to the right, whereby the pinion gear C733 meshed with the rack C723a rotates a predetermined angle in the counterclockwise direction.

2170 In addition, when the rotation of the eccentric cam C711a exceeds half a turn, the middle layer plate C721B slides to the left and returns to the original position, similarly to the case of the upper layer plate C721A.

2172 Subsequently, the left slider C723 slides to the left by the biasing force of the spring C732 and returns to the original position, and the pinion gear C733 rotates clockwise and returns to the original position.

2174 This reciprocating movement of the left slider C723 in the left-right direction causes the pinion gear C733 to reciprocate in the circumferential direction.

2176 Thereby, the push rod C81 of the left cup row replenishing device C80 returns to the waiting position after rotating from the standby position to the replenishing position, similarly to the push rod of the right cup row replenishing device C80 described above.

2179 As described above, the left cup row replenishing device C80 is driven, and thereby the reserve cup row WY

in the left reserve lane CY is replenished to the sales lane CK.

[0304]

2184 As shown in FIG. 23, in this single-type square cup supply mechanism C-4, a cup sold-out detection lever C36 for operating the cup sold-out detection switch C37 is also provided in the upper chute C34.

[0305]

2189 24 and 25 illustrate the replenishment operation of the reserve cup row WY from the right reserve aisle CY to the sales aisle CK.

2191 In addition, in the standby state before the start of the replenishing operation, as shown in FIG. 24(a), the push rod C81 is in the standby position, so that its main body C81a is located on the right side of the preparation cup row WY, and the bottom guide C82 The guide wall portion C82a is located on the left oblique rear side of the bottom of the preliminary cup row WY.

[0306]

2198 When the push rod C81 rotates clockwise around the bent portion C81d from this state, as shown in sequence in (b) and (c) of Fig. 24 The curled portions of the cups W come into contact and the curled portions of all the cups W are pressed, thereby moving the preliminary cup row WY to the left sales aisle CK side.

2202 In this case, the bottom of the preliminary cup row WY comes into contact with the guide wall portion C82a of the bottom guide C82 and presses it, so that the bottom guide C82 moves clockwise around the bent portion C83d of the support rod C83. direction of rotation.

2205 In addition, in this case, the engagement convex portion C82b of the bottom guide C82 cannot move to the left over the lower connecting portion C81c of the push rod C81, so that the bottom guide C82 is restricted by the push rod C81 toward the sales aisle. The CK side rotates in a rotating state.

2208 In addition, in this case, the curled portions of all the cups W in the preliminary cup row WY come into contact with and press the main body portion C83a of the support rod C83, so that the support rod C83 also moves along the bent portion C83d as the center. Rotate clockwise.

2211 In this way, the preliminary cup row WY moves to the left while being supported by the push rod C81, the bottom guide C82, and the support rod C83 from the right side of the curl portion, the left rear of the bottom, and the left rear of the curl portion.

2214 In addition, in this case, the preliminary cup array WY moves while being placed on the placement surface C51. Therefore, the bottom of the preliminary cup array WY is guided to the left by the peripheral wall portion of the placement surface C51. Moves smoothly and steadily.

[0307]

2220 When the push rod C81 further rotates, as shown in (a) of FIG. 25, the preliminary cup row WY further moves to the left.

2222 Then, the support of the bottom of the preliminary cup row WY by the bottom guide C82 is released, and the bottom guide C82 remains in this position.

2224 Thereafter, as the push rod C81 further rotates, the support of the support rod C83 on the preliminary cup row WY is also released, and the support rod C83 rotates counterclockwise by the biasing force of the spring at the upper end and returns to the original position.

2227 Then, as shown in (b) of the figure, when the push rod C81 reaches the replenishing position, the preliminary cup row WY reaches above the cup row feed port C52, and is thereby guided to the inside of the cup row feed port C52 and dropped. The lower end of the preliminary cup row WY penetrates the cup row feed port C52, and the preliminary cup row WY is stacked on the remaining sales cup row WK in a state of entering the uppermost cup W of the remaining sales cup row WK, and is replenished. Go to sales aisle CK.

2232 In this way, the reserve cup array WY is stacked on the sales cup array WK, whereby the cup sold-out detection lever C36 is pressed by the replenished reserve cup array WY and retreats from the cup array feeding port C52.

[0308]

2238 Thereafter, the push rod C81 rotates counterclockwise as shown in FIG. 25(c) and returns to the standby position.

2240 When returning to the standby position, the lower connecting portion C81c of the push rod C81 comes into contact with the engaging convex portion C82b of the bottom guide C82 and is pressed to the right, thereby causing the bottom guide C82 to also rotate in the counterclockwise direction. , return to the original position.

2244 Through the above, the replenishment operation of the reserve cup row WY to the sales channel CK is completed.

[0309]

2249 In addition, after the above-mentioned reserve cup row WY is replenished, the sales of beverages are started, and when the number of cups W in the sold cup row WK becomes less than the predetermined number, similarly to the above-mentioned case, the reserve cup row WY in the left reserve lane CY It is added to the sales aisle CK.

[0310]

2256 <Raw material supply organization D>

[0311]

2260 As shown in Figures 26, 27, and 46, the raw material supply mechanism D is used to eject a predetermined amount of beverage raw materials stored in the tank D10, such as instant coffee, cocoa powder, cream powder and other powdered raw materials, to the chute D20 each time. Or extract raw materials such as coffee beans and tea leaves, and further release them from the chute D20 to the cup W and the grinder K.

[0312]

2267 <Powder raw material supply mechanism D-1>

[0313]

2271 26 to 28 illustrate a powder raw material supply mechanism D-1 that discharges powder raw materials such as instant coffee, cocoa powder, or cream powder stored in the tank D10 to the cup W (see FIG. 43) transported by the cup transport mechanism H.

2274 For the sake of convenience, description will be made below with the right part in FIGS. 26 and 27 being referred to as the front and the left part as the rear.

[0314]

2279 The tank D10 is configured to have a container body D11 having a box shape with an input port D11a at the upper end; a hopper D12 provided at the lower end of the container body D11; and a delivery part D13 provided at the lower end of the hopper D12.

[0315]

2285 The container body D11 is a cylindrical portion having a rectangular cross section.

2286 The input port D11a of the container body D11 is provided with an inclination such that the height of the front edge is lower than the height of the rear edge.

2288 A lid D14 is provided in the input port D11a of the container body D11.

2289 The lid D14 is rotatably disposed on the container body D11 via, for example, a rear edge portion.

2290 As shown in FIG. 29, if the lid D14 is operated so as to move the front edge upward, the insertion opening D11a of the container body D11 can be opened.

2292 If the front edge is moved downward, the insertion opening D11a of the container body D11 can be closed by the lid D14.

[0316]

2297 A locking mechanism D15 is provided between the rear portion of the cover D14 and the container body D11.

2299 The locking mechanism D15 is used to maintain the lid D14 in an open state. For example, the locking mechanism D15 is configured by providing a sliding member D15a on the lid D14 and a sliding guide D15b on the container body D11.

2302 The sliding member D15a is a thin plate-shaped member having a fan shape centered on the rotation center of the cover D14, and is provided on both sides of the cover D14.

2304 A protrusion D15c is provided on the surface of each sliding member D15a.

2305 The sliding guide D15b is disposed so that the sliding member D15a of the lid D14 can slide between the

sliding guide D15b and the side surface of the container body D11.

2307 In this locking mechanism D15, when the lid D14 is opened, the protrusion D15c of the sliding member D15a passes through the gap between the sliding guide D15b and the container body D11.

2309 In this state, even if the hand is removed from the cover D14, the protrusion D15c is locked between the slide guide D15b and the container body D11, so the cover D14 is maintained in an open state.

2311 When the lid D14 is pressed downward from this state, the protrusion D15c passes through the gap between the slide guide D15b and the container body D11, and the lid D14 can close the insertion opening D11a of the container body D11.

[0317]

2317 An indicator D16 is provided on the front surface of the container body D11.

2318 The indicator D16 is disposed so as to be movable relative to the upper and lower guide rail portion D11b provided on the container body D11 and to be stopped at an arbitrary position.

2320 The front surface of this indicator D16 is white and can record the name of the powder raw material stored in the container body D11.

[0318]

2325 In addition, as shown in FIGS. 26 to 30, the container body D11 is provided with a raw material detection sensor D17.

2327 The raw material detection sensor D17 detects that the powder raw material stored in the container body D11 is lower than a preset lower amount.

2329 The raw material detection sensor D17 is configured by providing a light-emitting element D17a on one side of the container body D11 and a light-receiving element D17b on a portion of the other side facing the light-emitting element D17a.

2332 That is, the raw material detection sensor D17 is configured to output a detection signal of the raw material detection sensor D17 to the raw material supply control unit (not shown) when the light emitted from the light emitting element D17a is incident on the light receiving element D17b.

[0319]

2338 The hopper D12 is a funnel-shaped portion, and its size in the front-rear direction gradually becomes smaller as it goes downward.

2340 Two wheels D18 for stirring the stored powder raw materials are provided inside the hopper D12.

[0320]

2344 As shown in FIGS. 26 to 28, the delivery portion D13 is a hollow portion with an axis that is substantially horizontal in the front-to-back direction. It communicates with the inside of the hopper D12 through its central upper portion and through the discharge port D13a provided at its front end. Internally connected with the upper end of chute D20.

2348 An auger screw D19 is arranged inside the delivery part D13.

2349 The auger screw D19 has a spiral protrusion D19a on the outer circumferential surface of the shaft part, and can rotate around the axis of the shaft part in a state where the outer circumferential surface of the protrusion D19a and the inner circumferential surface of the delivery part D13 are brought close to each other.

2352 When the auger screw D19 rotates, the space formed between the delivery part D13 and the ridge D19a moves forward sequentially.

2354 That is, the powdery raw material that passes through the hopper D12 from the container body D11 and reaches the delivery part D13 is sequentially delivered forward by the rotation of the auger screw D19, and is discharged from the discharge port D13a of the delivery part D13 to the chute D20.

2357 As is clear from the figure, the base end portion of the auger screw D19 protrudes to the outside via the sliding hole D13b provided at the rear end of the delivery portion D13, and the protruding base end portion is connected to the screw motor D31 via the gear box D30. .

[0321]

2363 The chute D20 is a cylindrical member extending in the up-down direction and having a discharge port D21 at its lower end.

2365 A gate D22 is provided at the lower end of the chute D20.

2366 The gate D22 is disposed rotatably about the support shaft D22a.

2367 When the gate D22 is arranged at the blocking position shown by the solid line in FIG. 28, the outlet D21 of the chute D20 is blocked.

2369 When the gate D22 is arranged in the open position shown by the two-dot chain line in FIG. 28, the discharge port D21 of the chute D20 is opened.

2371 As shown in FIG. 31, in the gate D22, the upper surface (the cross-hatched portion in FIG. 31) when the gate D22 is disposed in the closed position is painted black as a process to increase the heat absorption rate.

[0322]

2376 In this gate D22, a gate opening lever D23 is provided at a position outside the chute D20 of the support shaft portion D22a.

2378 The gate opening lever D23 is provided to interlock with the gate D22.

2379 A tension spring D24 is provided between the gate opening lever D23 and the chute D20.

2380 The tension spring D24 biases the gate D22 to the closed position at ordinary times via the gate opening lever D23 and the support shaft D22a.

2382 When the gate D22 is in the closed position, the gate opening lever D23 is tilted backward and downward (lower right in FIG. 30). On the other hand, when the gate D22 is in the open position, the gate opening lever D23 is A posture that tilts backward and upward (upper right in Figure 30).

2385 That is, the gate D22 opens and closes the discharge port D21 of the chute D20 in conjunction with the vertical movement of the rear end portion of the gate opening lever D23.

[0323]

2390 As shown in FIGS. 26 and 27, the above-mentioned powder raw material supply mechanism D-1 is prepared according to the type of stored powder raw material, and is arranged inside the equipment casing 2 in a state of being arranged side by side with the same orientation..

2393 A cover member D40 is provided for the chute D20 of the plurality of powder raw material supply mechanisms D-1 arranged side by side.

2395 The cover member D40 has a box shape with an open lower surface, and is disposed so as to surround the plurality of chute D20 arranged side by side.

2397 Inside the cover member D40, a first heater D41 is disposed at a position on the rear side of the chute D20, and a second heater D42 is disposed on a position on the front side of the chute D20.

[0324]

2402 As shown in Fig. 32, the first heater D41 and the second heater D42 are each formed by laying an electric heating wire D44 in a planar shape inside a metal sheath D43. The front surface of D43 is a heating reference surface D45. As shown in FIGS. 27 and 30, each heating reference surface D45 is arranged to face the chute D20.

2406 As shown in FIG. 30, the first heater D41 disposed on the rear side of the chute D20 is disposed at a substantially middle position in the height direction of the chute D20, and is fixed in an attitude in which the heating reference plane D45 faces obliquely upward.

2409 The first heater D41 mainly performs the function of heating the rear middle portion of the chute D20 that faces the heating reference plane D45 to increase the temperature, and is a heater having a smaller heating capacity than the second heater D42..

2412 The second heater D42 disposed on the front side of the chute D20 is disposed on the lower end of the chute D20 directly in front of the gate D22 disposed in the blocking position, and is fixed in an attitude such that the heating reference plane D45 faces obliquely upward..

2415 The second heater D42 mainly performs a function of heating the powder raw material remaining inside the chute D20 to prevent moisture absorption, and a heater having a heating capacity greater than that of the first heater D41 is used.

2418 It is also clear from FIG. 30 that the entire surface of the heating reference plane D45 of the first heater D41 and the second heater D42 is located on the upper surface side of the gate D22 arranged in the blocking position. The heating reference surfaces D45 of the heater D41 and the second heater D42 are arranged side by side with each other in the direction along the upper surface of the gate D22.

[0325]

2425 33 to 39 illustrate the gate opening and closing device D50 for operating the gate D22 of the chute D20.

2426 The gate opening and closing device D50 includes a housing D51, a gate opening and closing lever D52, a selector lever D53, a cam device D54, a drive gear D55, a tension spring D56, and a leaf spring D57. The gate opening and closing device D50 is unitized.

[0326]

2432 The housing D51 extends in the left-right direction, is disposed behind the chute D20, and is disposed above the passage path of the cup transport mechanism H.

2434 The gate opening and closing lever D52 is used to open and close the gate D22 of the chute D20, and is provided corresponding to each chute D20.

2436 The selection lever D53 is used to select the gate opening and closing lever D52 to be operated, and is provided corresponding to each gate opening and closing lever D52.

2438 The cam device D54 is engaged with the gate opening and closing lever D52 via the cam portion D54a.

2439 The drive gear D55 meshes with the gear portion D54b of the cam device D54 and is connected to the rotation shaft D58a of the drive motor D58 by a pin D55a.

2441 One end of the tension spring D56 is connected to the gate opening and closing lever D52, and the other end is connected to the selector lever D53.

2443 This tension spring D56 functions to bias the gate opening and closing lever D52 in the counterclockwise direction and to bias the selector lever D53 in a direction approaching the gate opening and closing lever D52.

2446 The leaf spring D57 is supported by the gate opening and closing lever D52 and functions by engaging with the cam portion D54a of the cam device D54 to cause the cam device D54 to start rotating in the clockwise direction.

2449 Since the gate opening and closing device D50 is unitized as described above, it can be easily configured according to the number of tanks D10.

[0327]

2454 A plurality of gate opening and closing levers D52 are arranged at intervals in the left and right directions according to the intervals between the plurality of chute D20. The gate opening and closing levers D52 are each configured to be freely rotatable about a rotation hole D52 b for supplying water. The support shaft D52a extending in the left-right direction is axially fixed.

2458 As shown in Figures 36 and 37, each gate opening and closing lever D52 is centered on the support shaft D52a, and the lever pin D52c arranged at the rear end (right end of Figure 36) is engaged with the cam portion D54a of the cam device D54. Normally, , under the tension of the tension spring D56, the front end portion D52d (left end in Figure 36) stops at the lowermost standby position.

[0328]

2465 Furthermore, when the cam device D54 rotates in the clockwise direction in FIG. 36(a) , the lever pin D52c engaged with the cam portion D54a is pressed down, and the front end portion D52d rotates to open the gate. The pressing position (the position shown in Fig. 43) is the pressing position where the rear end portion D23a of the rod D23 is pushed upward.

2469 Moreover, the pressing protrusion part D52e is provided below the left center part (position shown in (a) of FIG. 37) of the gate opening and closing lever D52.

[0329]

2474 As shown in FIGS. 36 and 38, the selector lever D53 is composed of a lever portion D53a, a cam contact portion D53b, and a groove portion D53c.

2476 When the cup conveyance mechanism H operates, the rod part D53a is pressed by the housing H160 of the cup conveyance mechanism H.

2478 The cam contact portion D53b is in contact with a cam stopper D54d of the cam device D54, which will be described later. When the lever portion D53a moves to the rear (right direction in Fig. 36(a)) (see Fig. 40), the cam The contact portion D53b is separated from the cam stopper D54d, so that the cam device D54 can rotate in the clockwise direction (see (a) of Fig. 36).

2482 The groove portion D53c is used to slide the selector lever D53 in the front-rear direction along the sliding plate D51a of the housing D51.

[0330]

2487 The rod part D53a extends to a position lower than the upper surface height of the housing H160 in the cup conveying mechanism H (see FIG. 40). When the cup conveying mechanism H passes under the selector lever D53, the housing H160 moves the rod part D53a backward (Right direction in Figure 40).

2490 By this pressing, the cam contact portion D53b of the selector lever D53 moves rearward (see (a) of Fig. 42) and is separated from the cam stopper D54d.

2492 When the cam contact portion D53b is separated from the cam stopper D54d, the leaf spring D57 lifts the engaged portion of the cam portion D54a due to the reaction force of the leaf spring D57 being released, and the cam device D54 starts to move in the clockwise direction (Referring to (a) of FIG. 36, the gear portion D54b of the cam device D54 meshes with the drive gear D55, and the drive gear D55 rotates counterclockwise by the drive motor D58 to continue rotating in the clockwise direction.

[0331]

2500 When the housing H160 of the cup conveying mechanism H presses the rod part D53a to a predetermined position, the housing H160 is slightly conveyed forward by the Y-axis part H2 of the cup conveying mechanism H and temporarily stops at the predetermined position.

2503 Accordingly, the cup W is temporarily stopped vertically below the discharge port D21 with respect to the chute D20, and a predetermined amount of powder raw material is supplied to the cup W from the chute D20.

[0332]

2509 As shown in FIGS. 36 and 39, the cam device D54 has a cam portion D54a, a gear portion D54b, a gear notch portion D54c, and a cam stopper portion D54d. The cam device D54 is configured to be freely rotatable with the rotation hole D54f as the center. D54f is axially supported by the rotation axis D54e extending in the left-right direction.

2513 The cam portion D54a is provided on one surface of the cam device D54 and engages with the lever pin D52c of the gate opening and closing lever D52.

2515 The gear portion D54b meshes with the drive gear D55 to transmit the rotation of the drive gear D55 to the

cam device D54.

2517 A plurality of (three in the illustrated example) recessed portions D54g are provided in the cam portion D54a.

2519 The gear notch part D54c always faces the drive gear D55 and blocks the rotation of the drive gear D55.

2520 The cam stopper D54d is provided on the other surface of the cam device D54, and is normally in contact with the cam contact portion D53b of the selector lever D53, thereby preventing the rotation of the cam device D54.

2523 The cam stopper D54d functions in such a manner that when the lever D53a moves rearward, the cam stopper D54d is disengaged from the state of being in contact with the cam contact part D53b, thereby allowing the cam device D54 to rotate.

[0333]

2529 The operation of the gate opening and closing device D50 configured as above will be described.

2530 When the user selects instant coffee with cream/sugar through the operation input unit U1 of the operation unit U, for example, the cup W separated from the cup supply mechanism C is supplied to the cup transport mechanism H.

2533 At approximately the same time as the cup W is supplied from the cup supply mechanism C to the cup transport mechanism H, the screw motor D31 of the tank D10 housing the powder raw material to be supplied to the cup W is driven, and a predetermined amount of the powder raw material is discharged to the chute D20.

2537 At this time, in the chute D20, the gate D22 is arranged in the closed position, so the powder raw material discharged from the tank D10 is temporarily retained inside.

[0334]

2542 Next, when the cup W is arranged below the chute D20 due to the operation of the cup transport mechanism H, as shown in FIG. 40, the housing H160 moves rearward, whereby the lever D53a is pressed rearward, and the cam contact portion D53b moves from Cam stopper D54d is disengaged.

2545 Thereafter, as shown in Fig. 41, the housing H160 moves forward, and the cup W returns to the bottom of the chute D20.

[0335]

2550 As shown in (a) of Fig. 42, when the cam contact portion D53b is separated from the cam stopper D54d, the cam device D54 starts to rotate in the clockwise direction using the reaction force of the leaf spring D57, as shown in (b) of Fig. 42 As shown, gear portion D54b meshes with drive gear D55.

2553 Thereby, the cam device D54 continues to rotate in the clockwise direction by the drive gear D55 rotated in the counterclockwise direction by the drive motor D58.

[0336]

2558 When the cam device D54 rotates in the clockwise direction, as shown in FIG. 42(c), the lever pin D52c of the gate opening and closing lever D52 moves along the outer circumference of the cam portion D54a in the direction in which the gate opening and closing lever D52 is pressed. By rotating in the clockwise direction, as shown in Fig. 43, its front end portion D52d pushes up the rear end portion D23a of the gate opening lever D23.

2563 As a result, the gate D22 rotates in the counterclockwise direction and becomes a vertical state, the discharge port D21 of the chute D20 is opened, and the predetermined amount of powder raw material originally retained in the chute D20 is discharged to the cup W.

[0337]

2569 When the cam device D54 further rotates clockwise from the above state, as shown in Fig. 44, the lever pin D52c of the gate opening and closing lever D52 moves in the up and down direction along the plurality of recessed portions D54g provided in the cam portion D54a, As the lever pin D52c moves up and down, the gate opening and closing lever D52 repeatedly rotates in the counterclockwise direction and the clockwise direction multiple times (three times in the example shown in the figure).

[0338]

2577 As the gate opening and closing lever D52 rotates repeatedly in the counterclockwise and clockwise directions, the gate D22 vibrates impactfully due to the action of the tension spring D24.

2579 Thereby, even if the powder raw material is compressed and adheres to the upper surface of the gate D22, it can fall from the gate D22 due to the above-mentioned impact vibration, thereby preventing the powder raw material from remaining in the chute D20.

[0339]

2585 When the cam device D54 further rotates in the clockwise direction, the gear notch portion D54c reaches a position facing the drive gear D55, and the cam stopper D54d comes into contact with the cam contact portion D53b of the selector lever D53.

2588 Thereby, the rotation of the cam device D54 by the drive gear D55 is stopped.

2589 When the rotation of the cam device D54 stops, the gate opening and closing lever D52 uses the tension of the tension spring D56 to rotate in the counterclockwise direction, and the outlet D21 of the chute D20 is blocked by the gate D22.

2592 Thereafter, the above-described operation is repeated for all the tanks D10 containing the powder raw materials to be supplied to the cup W.

[0340]

2597 During this period, the first heater D41 and the second heater D42 are each in an energized state, and dissipate heat from the heat-generating reference plane D45.

2599 Here, as described above, the heat generation reference plane D45 of the second heater D42 faces obliquely

upward at a position closer to the upper surface side than the shutter D22 arranged in the blocking position.

2601 Therefore, when the powdery raw material remains on the upper surface of the gate D22, the powdery raw material is heated by the heat from the second heater D42 and is maintained in a dry state.

2603 The powder raw material remaining around the gate D22 and on the inner surface of the chute D20 is also continuously heated by the heat from the second heater D42.

2605 Moreover, since the upper surface of the gate D22 is painted black, the heat radiated from the second heater D42 is efficiently absorbed. Compared with the case where the white or transparent gate D22 is applied, even if the same heating is used, In the case of a high-capacity heater, it can also increase the ambient temperature by about 2° C.

2609 This eliminates the worry that the powdered raw material absorbs moisture and solidifies between the gate D22 and the chute D20, and ensures stable operation of the gate D22, so that the powdered raw material can always be discharged reliably.

2612 In particular, since the gate D22 is a portion where the powdery raw material is directly placed, if it is heated, moisture absorption of the powdery raw material can be prevented more efficiently.

2614 However, it is difficult to arrange a heating unit such as a heater on the gate D22 displaced between the open position and the closed position with respect to the chute D20.

2616 Therefore, the powder raw material supply mechanism D-1 that can increase the temperature of the gate D22 by painting the upper surface of the gate D22 black to increase the heat absorption rate is groundbreaking and does not require a dedicated heater for the gate D22. , and the heat of the second heater D42 can be efficiently transferred to the powdery raw material, so a heater with a small heating capacity can be used as the second heater D42.

[0341]

2624 On the other hand, part of the heat radiated from the second heater D42 passes through the gate D22, is reflected by the chute D20 located on the rear side, and travels diagonally upward toward the front side.

2626 The portion that reflects the heat radiated from the second heater D42 is in a temperature-rising state by the first heater D41.

2628 Therefore, the heat radiated from the second heater D42 is reflected at the chute D20 and reaches upward without causing a large heat loss.

2630 In addition, since the first heater D41 is disposed below the tank D10 and above the second heater D42, part of the heat radiated from the first heater D41 also reaches the lower end of the tank D10. That is, the vicinity of the discharge port D13a from which the powder raw material is discharged.

2633 As a result, the powdery raw material is also heated and maintained in a dry state in the delivery portion D13 of the tank D10. Therefore, the fear that the powdery raw material absorbs moisture and solidifies between the auger screw D19 and the delivery portion D13 of the tank D10 is eliminated. It can ensure the stable movement of the auger screw D19.

[0342]

2640 As described above, as for the first heater D41 which mainly performs the function of heating the rear side middle portion of the chute D20 to raise the temperature, it is sufficient to use a heater whose heating

capacity is smaller than that of the second heater D42.

2643 Therefore, the power consumption can be suppressed to a low level, and there is no concern that the running cost will significantly increase.

[0343]

2648 In addition, the first heater D41 and the second heater D42 are not necessarily limited to flat plates, and as shown in FIG. 45, curved heaters D46 and D47 or a bent heater D48 may be used.

2650 In addition, the heating reference plane D45 used in this specification is used to define the radiation direction of heat from the heater, and when it is flat as described above, it is the front surface of the heater.

2652 In the case of heaters D46 and D47 having curved cross sections as shown in FIGS. 45(a) and 45(b), the heating reference plane D45 includes the heating wire D44 located at the uppermost position and the heating wire D44 located at the lowermost position. The flat surface of the heating wire D44.

2655 In the case of the heater D48 that is bent halfway as shown in FIG. 45(c), there are independent heat-generating reference planes D45 on each front surface.

[0344]

2660 When the sales of beverages are carried out and the powder raw material stored in the tank D10 decreases, the raw material detection sensor D17 detects this situation and, for example, the raw material supply control unit (not shown) notifies the situation.

2663 Therefore, the operator can open the lid D14 after opening the front door 3 to replenish the powder raw material to the tank D10.

2665 At this time, as described above, the locking mechanism D15 is provided between the container body D11 and the lid D14. Therefore, the powder raw material can be replenished while the lid D14 is maintained in the open state, thereby simplifying the operation.

2668 Moreover, as long as the indicator D16 is moved up and down appropriately to determine the replenishment amount according to the sales volume in advance, the powder raw material will not be replenished excessively.

2671 That is, the indicator D16 is arranged in advance in the upper part of the tank D10 that stores the powder raw material with a large sales volume, and the indicator D16 is arranged in advance with the indicator D16 in the lower part of the tank D10 that stores the powder raw material with a small sales volume.

2674 As long as the operator replenishes powder raw materials with the configured position of each indicator D16 as the upper limit, the replenishment cycle of each powder raw material will be approximately the same, eliminating the worry of causing the following situation: a specific powder raw material frequently becomes empty, or vice versa. Powder raw materials are stored long-term in tank D10.

[0345]

2681 <Extraction raw material supply mechanism D-2>

[0346]

2685 As shown in FIGS. 46 and 47 , the extracted raw material supply mechanism D-2 discharges the extracted raw materials such as coffee beans and tea leaves stored in the tank D10 to the grinder K.

2687 The structure of the tank D10 is the same as that of the tank of the powder raw material supply mechanism D-1. It is different only in the following aspects, and the other structures are the same.

2689 Therefore, each component of the extraction raw material supply mechanism is given the same reference numeral as each component of the powder raw material supply mechanism D-1, and detailed descriptions thereof are omitted.

[0347]

2695 1) Wheel D18 is not installed on hopper D12.

[0348]

2699 2) The gate D22, the first heater D41, and the second heater D42 are not provided in the chute D20.

[0349]

2703 <Reservoir E>

[0350]

2707 As shown in Fig. 48, the liquid reservoir E stores drinking water required for producing beverages inside the equipment case 2. On the other hand, the liquid reservoir E stores drinking water required for the warm water tank F, ice maker G, carbonator Q, etc. Mechanically, the cup W transported to the cooking position supplies drinking water appropriately.

2711 As a method of storing drinking water in the reservoir E, in addition to the direct connection to the water pipe method, there is also a cylindrical water supply tank method.

2713 Next, a liquid reservoir E that stores drinking water directly connected to a water pipe will be described first.

2714 In addition, mark N1 in FIG. 48 is a cooling water tank for cooling the passing drinking water and the like.

2715 The upper surface of the cooling water tank N1 is open, and the cooling water tank N1 is formed at a location below the liquid reservoir E in the equipment housing 2 .

[0351]

2720 As shown in Figure 48, in this cup-type vending machine 1, the liquid reservoir E is connected to the tap water pipe opening through a water supply pipe E5 equipped with a water filter (added with activated carbon) E2 and two electromagnetic water supply valves E3 and E4. .

2723 Water filter E2 removes foreign matter contained in drinking water.

2727 The two electromagnetic water supply valves E3 and E4 are electromagnetic on-off valves that open and close the water supply pipe E5 based on instructions from the water supply control unit (not shown), and are respectively installed at the upstream and downstream sides of the water filter E2. at.

[0352]

2733 As shown in FIGS. 49 to 52, the reservoir E is configured to include a reservoir body E11, a lid E12, a detection rod E13, and a float switch E14.

2735 The reservoir body E11 is a container with an open upper surface, and stores drinking water supplied through the water supply pipe E5 inside.

2737 The cover E12 is used to close the upper surface opening of the reservoir body E11.

2738 The cover E12 is provided with a water supply port E12a connected to the downstream end of the water supply pipe E5.

2740 The detection rod E13 extends in the up-down direction while penetrating the sliding portion E12b provided on the cover E12, and is arranged to be movable up and down along the central axis.

2742 This detection rod E13 is provided with a flange E13a at its upper end located above the cover E12, and is provided with a float E13b at its lower end located inside the reservoir body E11.

2744 The flange E13a has a circular thin plate shape centered on the central axis of the detection rod E13.

2745 The float E13b moves up and down appropriately according to the fluctuation of the drinking water stored in the reservoir body E11, so that the detection rod E13 moves up and down relative to the cover E12.

2747 The float switch E14 has a high water level switch E14a and a low water level switch E14b, and controls the water supply control unit ((not shown) outputs a detection signal, and the float switch E14 is installed on the rod cover E16 provided on the upper part of the cover E12.

2750 When the drinking water stored in the reservoir body E11 drops to the water supply start level, the high water level switch E14a is operated via the flange E13a, and the high water level switch E14a outputs a water supply start signal to the water supply control unit (not shown) .

2753 When the water supply start signal is supplied from the high water level switch E14a, the water supply control unit (not shown) outputs an open signal to the two electromagnetic water supply valves E3 and E4, and both the two electromagnetic water supply valves E3 and E4 are opened. The water supply pipe E5 is connected to the reservoir body E11.

2757 In addition, when the drinking water rises to the water supply stop level (>water supply start water level), the high water level switch E14a is operated via the flange E13a, and the high water level switch E14a outputs a water supply stop signal to the water supply control unit (not shown) .

2760 When the water supply stop signal is supplied from the high water level switch E14a, the water supply control unit (not shown) outputs a closing signal to the two electromagnetic water supply valves E3 and E4, and both the two electromagnetic water supply valves E3 and E4 are closed. The water supply pipe E5 leading to the reservoir body E11 is cut off.

2764 When the drinking water stored in the reservoir body E11 drops to the sales stop level (<water supply start water level), the low water level switch E14b is operated via the flange E13a, and the low water level switch E14b controls the water supply control unit (not shown). (shown) outputs a sold out signal of drinking water.

2768 When the sell-out signal is output from the low water level switch E14b, a stop signal is output from the water supply control unit (not shown) to the water pump E1, and the water pump E1 becomes a stopped state.

[0353]

2773 Insertion holes E16a and E16b are provided at two positions where the heights of the rod cover E16 are different from each other.

2775 The insertion holes E16a and E16b are each formed to have a size that can insert the rod position-maintaining shaft E20. Two insertion holes E16a and E16b are respectively provided at portions of the rod cover E16 facing each other so that the inserted rod position-maintaining shaft E20 is substantially horizontal.

2778 The rod position maintaining shaft E20 is, for example, a cylindrical member such as the shaft portion of a screw or a screwdriver that an operator of the cup vending machine 1 usually carries.

[0354]

2783 The upper insertion hole E16a is provided at a position such that when the rod position-maintaining shaft E20 is inserted into the upper insertion hole E16a with the detection rod E13 arranged in a predetermined raised position, the rod position-maintaining shaft E20 can engage with the flange E13a The lower surface of the detector contacts to prevent the downward movement of the detection rod E13.

2787 When the rod position holding shaft E20 is inserted into the upper insertion hole E16a, regardless of the water level of the drinking water stored in the reservoir body E11, the water supply control unit (not shown) continues to flow from the high water level switch E14a. Output water supply stop signal.

[0355]

2793 The lower insertion hole E16b is provided at a position such that when the rod position-maintaining shaft E20 is inserted into the lower insertion hole E16b with the detection rod E13 disposed in a predetermined lowered position, the rod position-maintaining shaft E20 can engage with the flange E13a The upper surface of the detector contacts to prevent the upward movement of the detection rod E13.

2797 When the rod position holding shaft E20 is inserted into the lower insertion hole E16b, regardless of the water level of the drinking water stored in the reservoir body E11, water is continuously supplied from the low water level switch E14b to the water supply control unit (not shown). Sell out signal.

[0356]

2803 In the reservoir E configured as described above, drinking water is sequentially stored from the tap water pipe opening to the reservoir body E11 by opening the two electromagnetic water supply valves E3 and E4.

2805 During this period, as the water level rises, the float E13b rises, and the protruding amount of the detection rod E13 from the cover E12 gradually increases.

2807 When the drinking water stored in the reservoir body E11 reaches the predetermined water supply stop level and the high water level switch E14a is operated, the water supply control unit (not shown) sets both the two electromagnetic water supply valves E3 and E4 to a closed state. .

2810 Thereby, a predetermined amount of drinking water is stored in the reservoir body E11.

2811 At this time, in the reservoir E, two electromagnetic water supply valves E3 and E4 are provided in the water supply pipe E5. Therefore, even if one of the electromagnetic water supply valves E3 and E4 fails, the reservoir will not be damaged. The main body E11 is worried about the situation of drinking water overflowing.

2815 In addition, even if drinking water overflows from the reservoir body E11, the overflowing drinking water will be caught by the cooling water tank N1 provided below, and a drainage tray A10 is provided below the cooling water tank N1, so there is no equipment case 2. Worry about internal contamination.

[0357]

2821 When the water level of the drinking water stored in the reservoir body E11 decreases with the sale of beverages and the detection rod E13 descends and the high water level switch E14a outputs a water supply start signal, the water supply control unit (not shown) switches the two electromagnetic The water supply valves E3 and E4 are opened to replenish drinking water into the interior of the reservoir body E11 until the high water level switch E14a outputs a water supply stop signal.

2826 Thereafter, the above-described operation is repeated, and the drinking water level in the reservoir body E11 is maintained above a fixed level.

[0358]

2831 (a) of FIG. 53 shows a state in which the screw E20 is inserted into the upper insertion hole E16a as the rod position maintaining shaft, so that the water supply stop signal is continuously output from the high water level switch E14a.

2834 (b) of FIG. 53 shows a state in which the screw E20 is inserted into the lower insertion hole E16b, so that the sell-out signal is continuously output from the low water level switch E14b.

[0359]

2839 That is, in the state shown in FIG. 53(a), regardless of the water level of the reservoir body E11, the two electromagnetic water supply valves E3 and E4 are maintained in the closed state, so drinking water is not supplied to the reservoir body E11. Replenish.

2842 Therefore, when all the drinking water in the reservoir body E11 is to be emptied for maintenance reasons such as the operator cleaning the piping in the water circuit, the screw E20 can be inserted into the insertion hole provided above the rod cover E16 The hole E16a can be formed into the state shown in (a) of Fig. 53.

[0360]

2848 On the other hand, in the state shown in FIG. 53(b), the water pump E1 is kept in the stopped state by the water supply control unit (not shown), so even if the downstream hot water tank F, carbonator Q, and cooking position Drinking water will also not be supplied to these institutions when it is needed.

2851 Therefore, for example, when the operator cleans the hot water tank F provided downstream of the reservoir

E, he only needs to insert the screw E20 into the insertion hole E16b provided below the rod cover E16, even if he does not press it with his hands. The detection rod E13 also supplies drinking water from the reservoir E to the warm water tank F, so that the operator can easily clean the warm water tank F alone.

[0361]

2858 In addition, the method of maintaining the position of the detection rod E13 is not necessarily limited to inserting the rod position maintaining shaft E20 into the insertion holes E16a and E16b of the rod cover E16.

2860 For example, as shown in FIGS. 54 and 55, the rod cover E17 may be provided with slit-shaped insertion parts E17a and E17b, and the flange E18a of the detection rod E18 may be provided with protrusions capable of being inserted into the insertion parts E17a and E17b. E18b.

2863 That is, in normal times, as shown in FIG. 55(a), the protruding piece E18b is in an unconstrained state.

2864 On the other hand, when the operator performs work, as shown in FIG. 55(b), the protruding piece E18b is selectively inserted into the insertion portions E17a and E17b provided in the rod cover E17 to cause the detection rod E18 to Just keep it in the specified position. In addition, the insertion portions E17a and E17b provided in the rod cover E17 do not necessarily penetrate the rod cover E17, but may be concave grooves that open at the portion facing the protruding piece E18b.

[0362]

2872 In order to store drinking water in the liquid reservoir E having the above structure in the cylindrical water supply tank system, as shown in Fig. 48, it is only necessary to connect an auxiliary pump E30 to a portion of the water supply pipe E5 on the upstream side of the water filter E2. The auxiliary water supply pipe E31 is connected to the cylindrical water supply tank E32.

2876 In the cylindrical water supply tank method, a control signal is output from the water supply control unit (not shown) to the electromagnetic water supply valve E3 on the upstream side to maintain the closed state at all times. That is, when the water supply start signal is supplied from the high water level switch E14a of the reservoir E, the water supply control unit (not shown) only opens the electromagnetic water supply valve E4 on the downstream side and drives the auxiliary pump E30 to drain the water stored in The drinking water from the water supply tank E32 is replenished to the liquid reservoir body E11. When the water supply stop signal is supplied from the high water level switch E14a from the above-mentioned state, the water supply control unit (not shown) stops the auxiliary pump E30 and then closes the downstream electromagnetic water supply valve E4. Thereafter, the above-described operation is repeated, and the drinking water in the reservoir body E11 is maintained at a predetermined water level BH1 that is higher than a fixed level.

[0363]

2889 <Chlorine Generator B>

[0364]

2893 As described above, in the cup-type vending machine 1, as shown in FIG. 56, the drinking water supplied

from the tap water pipe passes through the water filter E2 and is stored in the reservoir body E11.

2895 The drinking water stored in the reservoir body E11 is supplied as dilution water for various beverages and ice-making water.

2897 Regarding the liquid reservoir E installed in the cup-type vending machine 1, some liquid reservoirs E are equipped with a chlorine generator B, and the chlorine generator B regenerates the drinking water stored in the liquid reservoir body E11 in the machine. Sterilize. The chlorine generator B can be used not only for drinking water from the tap water pipe, but also for drinking water from the water supply tank E32 installed inside or outside the equipment housing 2.

[0365]

2905 The chlorine generator B is a device that performs chlorine sterilization by electrolyzing the drinking water stored in the reservoir body E11.

2907 The chlorine sterilization method of the chlorine generator B is a method of effectively utilizing chlorine ions contained in drinking water (chlorine ions themselves do not have sterilizing ability), electrolyzing the drinking water to anodize the chlorine ions to generate chlorine, so that the Chlorine dissolves in water to sterilize drinking water. As shown in FIGS. 57 and 58, the chlorine generator B is provided with a chlorine generating electrode B4 having a pair of electrode plates B4a and B4a that applies a DC voltage to the water in the reservoir body E11, and the chlorine generator B generates chlorine. Electrode B4 is energized to electrolyze water. Therefore, as shown in the following formulas (BA) and (BB), the chlorine ions contained in the drinking water are anodized and lose electrons to be converted into chlorine, and the drinking water contains chlorine again and has bactericidal power.

[0366]

2919 $2Cl^- - 2e^- \rightarrow Cl_2$ (BA)

[0367]

2923 $Cl_2 + H_2O \rightarrow HClO + HCl$ (BB)

[0368]

2927 Next, a structural example of the water supply system of the cup-type vending machine 1 provided with the chlorine generator B will be described.

2929 As shown in FIG. 56, the water supply system of the cup vending machine 1 includes a liquid reservoir E, a chlorine generator B, and an ice maker G.

[0369]

2934 The reservoir body E11 is a container that stores water supplied from the water pipe opening through the water filter E2.

2936 The water in the reservoir body E11 is supplied to the water supply line E40 and the ice maker G.

2937 The reservoir body E11 stores water supplied via the electromagnetic water supply valves E3 and E4 up to a predetermined water level BH1 set by the float switch E14.

2939 The float switch E14 has a high water level switch E14a and a low water level switch E14b, and controls the opening and closing of the electromagnetic water supply valves E3 and E4 based on the operation of these switches E14a and E14b. When drinking water is introduced as beverages are sold, the water level of the reservoir body E11 drops and a water supply start signal is output from the high water level switch E14a, the electromagnetic water supply valves E3 and E4 receive the water supply start signal and open, and the water supply start signal from the tap water pipe mouth Drinking water is supplied to the reservoir body E11. Then, when the water level of the drinking water supply tank body E11 is restored and a water supply stop signal is output from the high water level switch E14a, the electromagnetic water supply valves E3 and E4 receive the water supply stop signal and close. Thereby, the reservoir body E11 is maintained at the predetermined water level BH1 set by the float switch E14.

[0370]

2952 The ice maker G generates ice using the drinking water supplied from the reservoir E and stores the ice, while appropriately supplying ice to the cup W through the ice supply passage G1.

[0371]

2957 The water supply line E40 is provided with a water pump E1, a water cooling coil E41 and an electromagnetic cold water valve E42.

2959 The water in the reservoir body E11 is cooled in the water cooling coil E41 by the driving force of the water pump E1, and then supplied to the cup W via the electromagnetic cold water valve E42.

[0372]

2964 In the water supply line E40, a carbonated water supply line E43 is connected between the water cooling coil E41 and the electromagnetic cold water valve E42.

2966 The carbonated water supply line E43 is provided with an electromagnetic water supply valve E44, a carbonator Q, and an electromagnetic carbonated water valve E45.

2968 When the electromagnetic water supply valve E44 is opened, the water flowing through the water supply line E40 is supplied to the carbonator Q to become carbonated water, and is supplied to the cup W via the electromagnetic carbonated water valve E45.

[0373]

2974 The chlorine generator B is installed in the reservoir body E11, and generates chlorine by electrolyzing the water stored in the reservoir body E11 as described above.

2976 The chlorine generator B includes a chlorine generating electrode B4 having a pair of electrode plates B4a and B4a, a DC power supply B14 that applies a voltage to the chlorine generating electrode B4, and an

energization control unit B15.

[0374]

2982 As shown in FIGS. 57 and 58, the chlorine generating electrode B4 has a structure in which two elongated electrode plates B4a and B4a are held side by side in a face-to-face manner with a predetermined interval between them by a holder B4b. It is selected to be about several mm.

2985 On the upper surface of the holder B4b, the terminal B4c of each electrode plate B4a protrudes and is connected to the DC power supply B14 side. The chlorine generating electrode B4 is inserted into the reservoir body E11 from above so that the holder B4b is located on the water surface and each electrode plate B4a is immersed in the water.

[0375]

2992 The chlorine generator B energizes the chlorine generating electrode B4 from the DC power supply B14 under the control of the energization control unit B15 at an appropriate time cycle or at a time that is coordinated with the beverage sales operation, so as to energize the chlorine generating electrode B4 of the reservoir body E11. Chlorine is produced in water to sterilize drinking water.

[0376]

2999 As shown in FIG. 56, the ice maker G generally returns melted water of ice generated in the ice storage chamber G21 to the reservoir body E11 through the melted water pipe E46.

3001 Therefore, in the accumulator body E11, when the melted water from the ice maker G flows back during the sales standby period in which the electromagnetic water supply valves E3 and E4 are closed and the water level is maintained at the predetermined water level BH1, the liquid accumulator body E11 The water level is raised to equalize the water level on the G side of the ice machine.

3005 As a result, the water level of the reservoir body E11 may rise to the rising water level BH2 exceeding the predetermined water level BH1 as shown in FIG. 57.

[0377]

3010 When the water level of the reservoir body E11 changes, the immersion area where the chlorine generating electrode B4 is submerged in the water, that is, the liquid contact area of the electrode plate B4a that directly participates in chlorine generation changes.

3013 Therefore, when the chlorine generation signal is supplied to energize the chlorine generation electrode B4 in this state, under the same energization conditions (applied voltage, energization time, etc.), compared with the case of energization in the state of the predetermined water level BH1, There is a difference in the amount of chlorine produced. That is, chlorine is generated on the surface of the portion of the electrode plate B4a that is immersed in water. Therefore, when the liquid contact area of the electrode plate B4a changes, the amount of chlorine generated changes accordingly. In this case, let the liquid contact area of the electrode plate B4a be BS, let the distance between the electrode plates B4a and B4a be BL, let the

conductivity of the drinking water be BEC, and let the applied voltage of the electrode B4 be BV, Assuming that the energizing current is BI, the relationship between the chlorine generation amount BQ and the following formula (BC) is established. Among them, Bk1 and Bk2 are constants. In addition, if the equation (BC) is expressed as a graph, it is as shown in Fig. 59.

[0378]

3027 $BQ=(BS/BL)\times BEC\times Bk1=(BI/BV)\times Bk2$ (BC)

[0379]

3031 On the other hand, if the chlorine concentration in drinking water is low, the bactericidal effect will be reduced. On the other hand, if the chlorine concentration is excessive, the chlorine smell will be too strong and the flavor of the beverage will be damaged. In addition, it will also cause coloring of the refreshing drink. Problems such as discoloration and deterioration of the materials that make up the pipes of the drinking water supply system.

[0380]

3039 Based on the above, in the chlorine generating electrode B4 shown in FIGS. 57 and 58, the elongated electrode plate B4a with the width dimension BD is used. Therefore, the liquid contact area of the electrode plate B4a greatly changes as the water level changes.

3042 That is, when the water level of the reservoir body E11 rises from the predetermined water level BH1 to the rising water level BH2, the liquid contact area of the electrode plate B4a increases at the ratio of $BD\times(BH2-BH1)$.

3045 Therefore, there is a possibility that the chlorine generation amount becomes excessive relative to the water storage capacity of the reservoir body E11, the chlorine concentration in the water becomes high, and the flavor of the drinking water is impaired by the chlorine smell.

[0381]

3051 Therefore, the structure according to the following modifications will be described below: Even if the water level of the reservoir body E11 rises above the predetermined water level BH1, even if the water level of the reservoir body E11 is different from that of the electrode plate B4a, the water storage amount will not be excessive. The ground produces chlorine.

3055 In addition, in FIGS. 60 to 66, elements that are the same as or similar to elements corresponding to the elements in FIGS. 57 to 58 are denoted by the same symbols.

[0382]

3060 As shown in FIGS. 60 and 61, the chlorine generating electrode B18 according to the first modified example is different from the above-mentioned chlorine generating electrode B4 in the shape of the pair of opposing

electrode plates B18a and B18a.

3063 In the electrode plate B18a, with the predetermined water level BH1 of the reservoir body E11 as a boundary, the width dimension Bd of the portion of the electrode plate B18a extending to the upper side of the predetermined water level BH1 is larger than the width dimension Bd of the electrode plate located below the predetermined water level BH1. The width of the part width dimension BD is small.

3067 The width dimension Bd is set to a small width that can ensure the current capacity required for energizing the electrode. The small width area of the electrode plate B18a may be formed corresponding to the expected water level rise fluctuation range area in the reservoir body E11.

[0383]

3073 Therefore, even when the water level in the reservoir body E11 exceeds the predetermined water level BH1 and rises to the rising water level BH2, the chlorine generating electrode B18 has only a smaller width Bd than the state of the predetermined water level BH1. Part of the electrode plate B18a is immersed in water unnecessarily, and the liquid contact area of the portion of the width dimension BD directly involved in chlorine generation of the electrode plate B18a is only slightly increased.

3078 Therefore, as long as the applied voltage and energization time of the electrodes are fixed, the amount of chlorine generated by energizing the electrodes will remain almost constant between the predetermined water level BH1 and the rising water level BH2. This eliminates the possibility that the chlorine concentration is excessive relative to the water storage amount of the reservoir body E11 and thereby impairs the flavor of the sold beverage.

[0384]

3086 As shown in FIG. 62, in the chlorine generating electrode B19 of the second modified example, the small width portion (width dimension Bd) of each electrode plate B19a is formed at the side end portion of each electrode plate B19a, and in a pair of electrodes facing each other, The small width portions between the plates B19a and B19a are alternately arranged on the left and right.

3090 That is, the small-width portions face each other on the diagonal line of the gap set between the electrode plates B19a and B19a, and the mutual distance is substantially larger than the gap size of the electrodes. Therefore, it effectively suppresses an increase in the current flowing in the water when the water level rises, that is, an increase in the amount of chlorine generated.

[0385]

3097 As shown in FIGS. 63 and 64, in the chlorine generating electrode B20 of the third modification, the predetermined water level BH1 of the reservoir body E11 is used as a boundary, and the electrical insulating material B21 is used to cover the electrode plate B4a extending to the predetermined water level BH1 On the surface of the upper part, the electrically insulating material B21 is obtained by, for example, resin coating.

[0386]

3104 Therefore, regarding the chlorine generating electrode B20, even if the water level exceeds the predetermined water level BH1 and rises to the rising water level BH2, only the portion of the electrode plate B4a insulated and covered by the electrical insulating material B21 is submerged in the water, and the liquid contact area of the electrode plate B4a that participates in the generation of chlorine constant.

3108 Therefore, the amount of chlorine generated does not increase due to rising changes in the water level and converges to a fixed amount.

[0387]

3113 As shown in FIGS. 65 and 66, in the chlorine generating electrode B22 of the fourth modification, with the predetermined water level BH1 of the reservoir body E11 as a boundary, in an area above the predetermined water level BH1, a pair of opposing electrode plates B4a, B4a is provided with an insulating partition wall B23.

3117 The width dimension BD1 of the insulating partition wall B23 is selected to be at least larger than the width dimension BD of each electrode plate B4a so as to cut off the underwater current path between the opposing electrode plates B4a and B4a.

3120 In addition, the insulating partition wall B23 may be integrally formed with the holder B4b.

[0388]

3124 Therefore, regarding the chlorine generating electrode B22, when the water level exceeds the predetermined water level BH1 and rises to the rising water level BH2, the lower end portion of the insulating partition wall B23 is submerged in the water, and the submerged portion is in the water between the electrode plates B4a and B4a. The flowing current acts as an obstacle.

3128 Accordingly, the surface area of the electrode plate B4a submerged in the water between the predetermined water level BH1 and the rising water level BH2 hardly participates in the generation of chlorine, so that the increase in the amount of chlorine generation caused by the rise in the water level can be suppressed to a small amount.

[0389]

3135 < Warm water tank F>

[0390]

3139 As shown in FIG. 48, the warm water tank F generates hot water using the drinking water supplied from the reservoir E and stores the hot water. On the other hand, the warm water tank F is suitable for the brewing mechanism L and the cup W transported to the cooking position. Ground water supply.

3142 As shown in FIGS. 67 to 72, the hot water tank F is made of a metal material, has a rectangular parallelepiped shape, and is installed at a relatively high position inside the equipment case 2.

[0391]

3147 A heater F1 and a float F2 are provided inside the warm water tank F.

3148 When driven in accordance with an instruction from a tank control unit (not shown), the heater F1 heats the drinking water stored in the hot water tank F to generate hot water.

3150 The float F2 floats up and down appropriately in accordance with the water level of the warm water tank F, and is provided with a sensing arm F3. The sensing arm F3 protrudes to the outside from the upper surface of the warm water tank F, and its protruding end is rotatably supported on the warm water tank F by a support shaft F4 extending in the horizontal direction. That is, the float F2 moves up and down inside the hot water tank F by rotating around the support shaft F4. As the float F2, a float made of metal such as stainless steel is used.

[0392]

3159 A hot water ejection unit F10 and a lower temperature sensor F20 are provided on the front surface of the hot water tank F.

3161 The hot water discharge unit F10 includes two hot water supply valves F11 and F12, a discharge temperature sensor F13, and an overflow pipe F14. The hot water supply valves F11 and F12 are electromagnetic on-off valves provided at the hot water supply port F5 of the hot water tank F. They supply hot water according to instructions from the tank control unit (not shown) as shown in FIG. 48 The supply pipe F11a and the hot water supply pipe F12a are opened and closed independently. The hot water supply pipe F11a connects the hot water tank F and the hot water nozzle at the cooking position. The hot water supply pipe F12a connects the warm water tank F and the brewing mechanism. Connect between L. The discharge temperature sensor F13 detects the temperature of the hot water discharged through the hot water supply valves F11 and F12, and outputs the detection signal to the tank control unit (not shown). The overflow pipe F14 is used to discharge the water vapor generated inside the warm water tank F to the outside, and the overflow pipe F14 extends downward from the upper part of the warm water tank F. A boiling prevention thermocouple F30 is provided at the lower end of the overflow pipe F14. The boiling prevention thermocouple F30 is a bimetallic thermocouple that is inserted into a drive circuit (not shown) of the heater F1 and operates based on the temperature of the water vapor passing through the overflow pipe F14. When the temperature of the water vapor exceeds a preset temperature, the drive circuit of the heater F1 is forcibly cut off. The lower temperature sensor F20 detects the temperature of the hot water stored in the lower part of the hot water tank F, and outputs the detected temperature information to the tank control unit (not shown). When the temperature detected by the lower temperature sensor F20 is lower than the preset temperature, the tank control unit (not shown) controls the heater F1 on the condition that neither the high water level switch F31 nor the low water level switch F32 described below is operated. Driven for heating of drinking water. On the other hand, when the temperature detected by the lower temperature sensor F20 exceeds the preset temperature, the tank control unit (not shown) operates on the condition that neither the high water level switch F31 nor the low water level switch F32 described below is operated. Heater F1 stops heating drinking water.

[0393]

3188 A front heat insulating material F6 is provided on the front surface of the hot water tank F except for the installation positions of the hot water supply valves F11 and F12 and the installation position of the lower temperature sensor F20.

3191 The front heat insulating material F6 is formed into a sheet form from a resin material such as melamine foam or foamed polypropylene, for example.

[0394]

3196 A front cover F40 is provided at the location where the hot water supply valves F11 and F12, the discharge temperature sensor F13, and the overflow pipe F14 are arranged in the above-mentioned hot water discharge unit F10.

3199 The front cover F40 is molded from a resin material such as melamine foam and has heat insulation properties.

[0395]

3204 A high water level switch F31, a low water level switch F32, and a dry burning prevention thermocouple F34 are provided on the upper surface of the warm water tank F.

3206 The high water level switch F31 and the low water level switch F32 are operated by the float F2 arranged inside the warm water tank F.

[0396]

3211 That is, as shown in FIG. 72(a), when the water level of the hot water tank F drops, the float F2 moves downward and is located below the support shaft F4.

3213 At this time, the tip end of the sensing arm F3 is in a state where the low water level switch F32 is operated, and a detection signal is output from the low water level switch F32 to the tank control unit (not shown). When the detection signal is output from the low water level switch F32, the tank control unit (not shown) stops the heater F1 and drives the water pump E1 of the reservoir E to replenish the warm water tank F with drinking water.

[0397]

3221 As shown in (b) of FIG. 72, when the water level in the hot water tank F rises, the sensing arm F3 gradually rotates around the support shaft F4.

3223 When the sensing arm F3 operates the high water level switch F31 when the warm water tank F reaches the predetermined water level, a detection signal is output from the high water level switch F31 to the tank control unit (not shown). When the detection signal is output from the high water level switch F31, the tank control unit (not shown) stops the water pump E1 of the reservoir E to complete the replenishment of drinking water to the warm water tank F. At the same time, the heater F1 is driven to heat the drinking water stored in the hot water tank F. The dry boil prevention thermocouple F34 is a bimetal type thermocouple that operates based on the internal temperature of the hot water tank F. Like the boiling prevention

thermocouple F30, it constitutes a drive circuit of the heater F1 (not shown). This dry burning prevention thermocouple F34 operates to forcibly cut off the drive circuit of the heater F1 when the internal temperature of the hot water tank F exceeds a preset value.

[0398]

3236 The entire upper area of the warm water tank F is covered by the upper cover F50.

3237 The upper cover F50 has a rectangular parallelepiped shape with an open lower surface, is molded from a resin material such as melamine foam, and has heat insulation properties.

[0399]

3242 As shown in FIG. 70, vacuum insulation materials F37 are provided on the left and right side surfaces and the rear surface of the hot water tank F via internal insulation materials F35 and external insulation materials F36 .

3245 The vacuum insulation material F37 is configured in a flat plate shape with a thickness of approximately 15 mm. The internal heat insulating material F35 is, for example, in the form of a sheet with a thickness of about 10 mm, and is made of resin materials such as melamine foam and foamed polypropylene that are excellent in heat resistance. The external insulation material F36 is in the form of a sheet with a thickness of 5 mm, for example, and is used to protect the vacuum insulation material F37.

[0400]

3253 As shown in FIG. 71, a flat plate-shaped lower heat insulating material F38 made of a resin material such as melamine foam or foamed polypropylene is also disposed on the lower surface of the hot water tank F.

3255 The ejection port F39 protruding from the lower surface of the hot water tank F is used to connect the cleaning tool F60 as shown in FIG. 67.

[0401]

3260 The cleaning tool F60 is used to clean the inside of the equipment case 2 with hot water from the warm water tank F. It is equipped with a nozzle F61 at the front end and is operated by the flexibility of an operating lever F62 equipped with a flush valve (not shown) on the handle. tube composition.

3263 When the operation lever F62 is not operated, the flush valve (not shown) of the cleaning tool F60 is in a closed state, and hot water is not sprayed from the nozzle F61 at the front end. When the flush valve (not shown) is opened with the help of the operating lever F62 of the handle, the hot water originally stored in the warm water tank F can be sprayed out from the nozzle F61 at the front end to clean the inside of the equipment housing 2. Although not shown explicitly in the figure, when not in use, this cleaning tool F60 can be stored in a state where the front end portion is locked with a locking portion provided inside the equipment case 2. The locking part locks the cleaning tool F60 in a state where the nozzle F61 at the front end of the cleaning tool F60 is positioned higher than the highest water level of the hot water stored in the hot water tank F. Therefore, even if a defect occurs in the flush valve (not shown), the hot water in the hot

water tank F will not drip from the nozzle F61 of the cleaning tool F60 in the stored state.

[0402]

3276 In the hot water tank F configured as described above, as described above, the tank control unit (not shown) drives the heater F1 and the reservoir E appropriately based on the detection signals from the high water level switch F31 and the low water level switch F32. The water pump E1 internally stores hot water maintained in a desired high-temperature state so that the water level is always maintained above a fixed level.

[0403]

3284 When a hot water supply request is output from the brewing mechanism L and the stirring mechanism J to the tank control unit (not shown), instructions are provided to the corresponding hot water supply valves F11 and F12 to supply the stored hot water to the brewing mechanism. L, cup W in the cooking position.

[0404]

3290 Here, according to this hot water tank F, as mentioned above, the dry burning prevention thermocouple F34 and the boiling prevention thermocouple F30 are provided.

3292 Therefore, even if the heater F1 should be stopped based on the detection signal of the low water level switch F32 or the detection temperature of the lower temperature sensor F20, the heater F1 does not stop due to an abnormality occurring in the drive circuit of the heater F1, for example. In this case, due to the increase in the internal temperature of the hot water tank F and the temperature of the water vapor, the dry burning prevention thermocouple F34 and the boiling prevention thermocouple F30 operate to automatically cut off the drive circuit of the heater F1.

3298 This can prevent the hot water tank F from becoming overheated.

[0405]

3302 <Ice Maker G>

[0406]

3306 As shown in FIG. 48, the ice maker G generates ice using the drinking water supplied from the reservoir E and stores the ice, while appropriately supplying ice to the cup W through the ice supply passage G1.

3308 For the ice maker G, water is supplied from the reservoir body E11 by appropriately adjusting the water level of the reservoir E, not by driving the water pump E1.

3310 Next, the auger type ice maker will be described.

[0407]

3314 As shown in FIG. 73 , the ice making machine G includes an ice making part G10, an ice storage part G20, and an ice cube chute G30.

3316 As shown in FIG. 74, the ice making part G10 is equipped with the auger G12 inside the ice making cylinder G11.

3318 The ice cylinder G11 is a metal cylindrical member, and has a refrigerant passage G13 around it. The refrigerant passage G13 functions as an evaporator, and constitutes a refrigeration circuit together with the compressor N2, the condenser N5, and the expansion valve N15 as shown in FIG. 179 . As shown in Fig. 73, when drinking water is supplied to the inside of the ice cylinder G11 while the refrigeration circuit is driven, the refrigerant passage G13 cools the drinking water so that the drinking water condenses inside the ice cylinder G11. ice. The auger G12 has a spiral cutting blade G12a, and the cutting blade G12a is disposed so as to be rotatable inside the ice making cylinder G11 in a state of sliding contact with the inner peripheral surface of the ice making cylinder G11. The auger G12 is connected to the drive motor G15 via the reduction gear G14. When driven, the auger G12 scrapes the ice accumulated on the ice making cylinder G11 and gradually feeds the scraped ice pieces upward. A fixed blade G16 is provided at the inner upper end of the above-mentioned ice making cylinder G11. The fixed blade G16 compresses the sheet-shaped ice fed by the auger G12 and solidifies the ice into a rod shape.

[0408]

3333 The ice storage part G20 is a bottomed cylindrical heat-insulating container and has an ice storage chamber G21 inside.

3335 The ice storage part G20 is provided on the upper part of the ice making cylinder G11, and the ice storage chamber G21 communicates with the inside of the ice making cylinder G11 via the connecting tube G22 provided on the bottom of the ice storage part G20.

[0409]

3341 The ice storage chamber G21 is provided with a rotation shaft G23, a stirrer G24, a partition member G25, a detection plate G26, and an ice storage amount detection switch G27.

3343 The rotating shaft G23 protrudes upward from the upper end of the auger G12 and can rotate together with the auger G12. The stirrer G24 is a plurality of cylindrical members protruding radially from the rotation axis G23. Each stirrer G24 is installed at the position where the height of the peripheral surface of the rotation shaft G23 differs from each other, and is inclined gradually downward or upward toward the outer periphery. The stirrer G24 rotating together with the rotating shaft G23 has a function of breaking the ice solidified into a rod shape by the auger G12 to generate thin ice flakes, and has the function of preventing the ice flakes from fusing into ice flakes by stirring inside the ice storage chamber G21. The function of large ice cubes.

[0410]

3354 The partition member G25 is a substantially disk-shaped member that covers the inner bottom surface of the ice storage compartment G21. It has a communication hole G25a in the center and a large number of

drainage holes (not shown) in a portion around the communication hole G25a..

3357 The communication hole G25a is a circular notch connected to the upper end opening of the communication tube G22, and the inside of the communication hole G25a is penetrated by the rotation shaft G23. The drainage hole is a circular hole with a diameter smaller than the diameter of the communication hole G25a. The above-mentioned partition member G25 is formed by molding metal such as stainless steel. The detection plate G26 is disposed in an upper portion of the ice storage chamber G21 so as to be movable up and down. The detection plate G26 is maintained in a downward state due to its own weight in a normal state. On the other hand, when the ice in the ice storage chamber G21 is stored near the upper end, the detection plate G26 pressed by the ice moves upward. The ice storage amount detection switch G27 outputs a detection signal to the ice making control unit (not shown) when the detection plate G26 moves upward. When the detection signal is output from the ice storage amount detection switch G27, the refrigeration circuit is stopped, and the drive motor G15 is stopped, so the generation of ice is stopped.

[0411]

3371 In addition, the ice storage compartment G21 is provided with a discharge port G21a on the lower peripheral surface.

3373 The discharge port G21a is used to discharge the ice stored inside to the outside. An opening and closing door G28 is provided to this discharge port G21a, and an ice cube chute G30 is connected to it.

[0412]

3378 The opening and closing door G28 is provided in the ice storage part G20 so that the discharge port G21a can be opened and closed.

3380 A door solenoid G29 is connected to the opening and closing door G28. When the door solenoid G29 is demagnetized, the opening and closing door G28 is maintained in a state in which the discharge port G21a is closed by the return spring G29a. When the door solenoid G29 is excited, the opening and closing door G28 is moved against the elastic force of the return spring G29a, and the discharge port G21a is maintained in an open state.

[0413]

3388 The ice chute G30 collects the ice discharged from the discharge port G21a and transports it downstream, and is connected to the upper end of the ice supply passage G1.

3390 An ice quantitative sensor G31 is provided in the ice chute G30. The ice quantitative sensor G31 detects the passing amount of collected ice, and outputs the detection result to the ice making control unit (not shown). In the ice making control unit (not shown), the detection results of the ice quantitative sensor G31 are accumulated sequentially from the time point when the door solenoid G29 is excited to open the opening and closing door G28, and compared with a preset value.. When the integrated result reaches a preset value, the door solenoid G29 is demagnetized by the ice making control unit (not shown) to close the opening and closing door G28. As a result, a predetermined fixed amount of ice is supplied to the downstream cup W.

[0414]

3400 <Cup conveying mechanism H>

[0415]

3404 As the cup conveying mechanism H, a three-axis cup conveying mechanism H-1 and a suspended cup conveying mechanism H-2 are exemplified.

3406 First, the 3-axis cup conveying mechanism H-1 will be described.

[0416]

3410 <3-axis cup conveying mechanism H-1>

[0417]

3414 The 3-axis cup conveyance mechanism H-1 conveys the cup W supplied to the cup supply position to the cooking position via the receiving position, and then conveys it to the sales position facing the outlet mechanism S.

3417 The cup conveying mechanism H-1 is provided, for example, below the raw material supply mechanism D inside the equipment housing 2.

3419 The cup conveying mechanism H-1 is capable of 3-axis movement in the X direction, the Y direction, and the Z direction. The X direction is the left and right direction when the cup vending machine 1 is viewed from the front, the Y direction is the depth direction, and the Z direction is the height. direction.

3422 Depending on the specifications, it can also be configured as an XY 2-axis action mechanism that omits the mechanism in the Z direction. As described above, the drain tray A10 for catching overflowing beverages and raw materials is provided below the cup transport mechanism H-1.

[0418]

3428 As shown in FIG. 76 , the cup transport mechanism H-1 includes an XY stage H10 and a cup holding device H12.

3430 First, the XY stage H10 will be described.

[0419]

3434 The XY stage H10 includes an X-axis portion H14 extending in the X direction and a Y-axis portion H16 mounted on the upper surface of the X-axis portion H14 and extending in the Y direction.

3436 The Y-axis portion H16 can be moved in the X direction using the X-axis portion H14. The cup holding device H12 is mounted on the upper surface of the Y-axis portion H16 and can move in the Y direction using the Y-axis portion H16.

[0420]

3442 The X-axis part H14 is equipped with an X-axis cover H18, an X-axis conveyor motor H20, an X-axis motor driver H22, an X-axis drive pulley H24, an X-axis driven pulley H25, an Axis origin sensor H30 and anti-separation plates H32 near both ends.

[0421]

3448 The X-axis cover H18 is an upper surface panel for mounting the Y-axis portion H16, and forms a gentle arc surface when viewed from the X direction to facilitate mounting and guiding the Y-axis portion H16.

3450 In addition, the X-axis cover H18 protects the inside of the X-axis portion H14 from contamination and facilitates cleaning.

[0422]

3455 The X-axis conveyance motor H20 is a stepping motor that drives the Y-axis portion H16 in the X direction, and is provided near the left end inside the X-axis portion H14.

3457 The X-axis motor driver H22 is a driver that drives the X-axis conveyor motor H20. It is arranged close to the X-axis conveyor motor H20 to improve noise immunity.

[0423]

3462 The X-axis drive pulley H24 is provided on the output shaft of the X-axis conveyor motor H20 and is wound with an X-axis synchronous belt H26 to convert the rotational motion of the X-axis conveyor motor H20 into reciprocating motion in the X direction.

3465 An X-axis driven pulley H25 is provided near the right end inside the X-axis portion H14, and the X-axis synchronous belt H26 is wound between the X-axis driving pulley H24 and the X-axis driven pulley H25 with almost no slack. A part of it is fixed to the Y-axis part H16.

[0424]

3471 The X-axis adjustment screw H28 is used to adjust the tightness of the X-axis timing belt H26 and is used during maintenance.

[0425]

3476 The X-axis origin sensor H30 is a visible light cutoff type sensor used to detect the origin position of the X-axis.

3478 In this embodiment, a dust-proof photointerrupter is used as the X-axis origin sensor H30, which is resistant to contamination and changes over time.

[0426]

3483 The anti-separation plate H32 is an anti-separation piece of the Y-axis part H16 and is set at both ends of the required movement range inside the equipment housing 2.

[0427]

3488 Regarding the X-axis portion H14, the rotational motion of the X-axis conveying motor H20 is transmitted to the X-axis timing belt H26 via the Move to each stop position.

3490 The movement distance to each stop position is determined by the pulse count rotation number control of the X-axis conveyance motor H20.

[0428]

3495 The X-axis part H14 moves the Y-axis part H16 toward the X-axis standby position at the end of each sale, and activates the X-axis conveyance motor H20 when the X-axis origin sensor H30 detects that the Y-axis part H16 has reached the X-axis standby position. stop.

3498 The X-axis standby position is, for example, the rightmost side of the X-axis portion H14.

[0429]

3502 Y-axis part H16 is equipped with Y-axis cover H34, Y-axis conveyor motor H36, Y-axis motor driver H38, Y-axis drive pulley H40, Y-axis driven pulley H41, Y-axis timing belt H42, Y-axis adjustment screw H44, Y Axis origin sensor H46, anti-separation plates H48 near both ends, and Y-axis lock solenoid H50.

[0430]

3508 The Y-axis cover H34 is an upper surface panel for mounting the cup holding device H12. It forms a gentle arc surface when viewed from the Y direction, making it easy to mount and guide the cup holding device H12.

3511 In addition, the Y-axis cover H34 protects the inside of the Y-axis portion H16 from contamination and facilitates cleaning.

[0431]

3516 The Y-axis conveyance motor H36 is a stepping motor that drives the Y-axis portion H16 in the Y direction, and is provided near the rear end inside the Y-axis portion H16.

3518 The Y-axis motor driver H38 is a driver that drives the Y-axis conveyor motor H36. It is arranged close to the Y-axis conveyor motor H36 to improve noise immunity.

[0432]

3523 The Y-axis drive pulley H40 is provided on the output shaft of the Y-axis conveyor motor H36, and is wound

with a Y-axis synchronous belt H42 to convert the rotational motion of the Y-axis conveyor motor H36 into reciprocating motion in the Y direction.

3526 A Y-axis driven pulley H41 is provided near the front end inside the Y-axis portion H16, and the Y-axis synchronous belt H42 is wound between the Y-axis driving pulley H40 and the Y-axis driven pulley H41 with almost no slack. A part thereof is fixed to the cup holding device H12.

[0433]

3532 The Y-axis adjustment screw H44 is used to adjust the tightness of the Y-axis timing belt H42 and is used during maintenance.

[0434]

3537 The Y-axis origin sensor H46 is a visible light cutoff type sensor used to detect the origin position of the Y-axis.

3539 In this embodiment, a dust-proof photointerrupter is used as the Y-axis origin sensor H46, which is resistant to contamination and changes over time.

[0435]

3544 The anti-separation plate H48 is an anti-separation piece of the cup holding device H12, and is set at both ends of the necessary movement range inside the equipment housing 2.

3546 The anti-separation plate H48 only needs to bear a relatively small load, and is set to be smaller than the anti-separation plate H32.

[0436]

3551 The Y-axis lock solenoid H50 is a solenoid for locking the Y-direction position of the cup holding device H12 by fixing a part of the Y-axis timing belt H42.

3553 According to the locking function of the Y-axis lock solenoid H50, even after the cup holding device H12 is arranged in the holder S14 of the outlet mechanism S (see FIG. 195), the outlet door S10 is opened and the user puts his hand into the holder. Even if the cup W or a part of the cup holding device H12 is contacted in S14 and a force is exerted in the Y direction, the displacement of the cup holding device H12 can be restricted and the cup W can be placed stably.

3558 In addition, as described above, the cup holding device H12 is also fixed in the X direction by the protruding piece S30 (see FIG. 197) in the holder S14. Therefore, the cup holding device H12 is fixed in the X direction and the Y direction.

[0437]

3564 Regarding the Y-axis portion H16, the rotational motion of the Y-axis conveyance motor H36 is transmitted to the Y-axis timing belt H42 via the Y-axis driving pulley H40. Due to the circular rotation of the Y-axis

timing belt H42, the cup holding device H12 faces in the Y direction. Move to each stop position.

3567 The movement distance to each stop position is determined by the pulse count rotation number control of the Y-axis conveyance motor H36.

[0438]

3572 The Y-axis portion H16 moves the cup holding device H12 toward the Y-axis standby position at the end of each sale, and activates the Y-axis conveying motor H36 when the Y-axis origin sensor H46 detects that the cup holding device H12 has reached the Y-axis standby position. stop.

3575 The Y-axis standby position is, for example, the innermost side on the Y-axis portion H16.

[0439]

3579 The cup holding device H12 has a function of holding the cup W and a Z-axis movement function.

3580 This Z-axis movement can perform two or more steps of displacement according to the size of the cup W, and the Z-axis movement range is smaller than the movement range of the XY stage H10.

[0440]

3585 As shown in FIG. 77, the cup holding device H12 is composed of a housing H160 serving as a mechanism accommodating portion as a base body, and has a base H181 projecting horizontally toward the front (front direction) from the lower portion of the housing H160, A pair of cup baffles H182L and H182R protruding from the front and a pair of guide pieces H183 protruding to both sides of the lower part of the housing H160.

3590 In Figure 77, a guide piece H183 is hidden on the rear side of the housing H160, and is symmetrical with the guide piece H183 exposed on the front side.

[0441]

3595 The table H181 is a cup receiving table that receives the cup W supplied from the cup supply mechanism C.

3596 Table H181 is provided with a plurality of holes in a grid pattern to prevent spilled drinks and the like from accumulating.

[0442]

3601 Make sure there is a gap in the Y direction between the table H181 and the cup baffles H182L and H182R.

3602 When entering the holder S14 of the outlet mechanism S described later (see FIG. 197), the optical axes of the outlet cup detection sensors S24 a and S24 b pass through the gap between the table H181 and the cup shutters H182L and H182R. Detect the presence or absence of cup W.

[0443]

3608 The guide piece H183 is a portion that clamps both sides of the Y-axis portion H16 and transmits its driving force from the Y-axis portion H16.

3610 The guide piece H183 is driven by the Y-axis part H16, whereby the entire cup holding device H12 moves in the Y direction.

3612 In addition, the X-direction width of the left and right guide pieces H183 is set slightly smaller than the inner width of the pair of protruding pieces S30 in the outlet mechanism S.

3614 Therefore, when the cup holding device H12 moves forward and the table H181 is arranged in the holder S14 of the outlet mechanism S, the left and right guide pieces H183 enter between the pair of protruding pieces S30.

3617 Accordingly, even if the user applies force to the cup W and the cup transport mechanism H-1 in the W.

[0444]

3621 As shown in Figures 77 and 78, the housing H160 of the cup holding device H12 is provided with a Z-axis drive motor H184, a Z-axis origin switch H185, a Z-axis position detection switch H186, a Z-axis guide H187, and a pair of H-axis drive arms H188. .

[0445]

3627 The pair of cup shutters H182L and H182R support the cup W received by the table H181 from both sides, and are each supported by the H-axis driving arm H188 in a manner that the cup W is openable and closable.

3630 Let this opening and closing direction be the H direction.

[0446]

3634 The Z-axis drive motor H184 is a motor that moves the table H181 in the up-and-down direction (Z direction).

3636 The cup baffles H182L and H182R move up and down integrally with the table H181.

3637 Z-axis origin switch H185 is a switch that detects the Z-axis origin position of table H181.

3638 In this embodiment, a dust-proof photointerrupter is used as the Z-axis origin switch H185, which is resistant to contamination and changes over time. The Z-axis position detection switch H186 is a switch that detects the Z-direction position of the table H181 in a stepped manner. The Z-axis guide H187 guides the table H181 along the Z direction to stabilize its position and posture. A pair of H-axis driving arms H188 are arranged closely in the X direction and are axes for opening and closing the cup shutters H182L and H182R. Cup baffles H182L and H182R can be removed and replaced relative to the H-axis drive arm H188.

[0447]

3647 In addition, when the cup W used in the cup vending machine 1 has one type of height, components related to the Z-axis operation such as the Z-axis drive motor H184 may be omitted.

[0448]

3652 In the cup holding device H12, the rotational motion of the Z-axis drive motor H184 is transmitted to the table H181, and the table H181 moves up and down in the Z direction toward each stop position.

3654 The Z-axis position detection switch H186 detects the movement distance to each stop position.

3655 When the stand H181 is lowered to the lower standby position at the end of the sale, the Z-axis origin switch H185 is used to detect this situation, and the Z-axis drive motor H184 is stopped at this time.

[0449]

3660 Next, the pair of cup baffles H182L and H182R and their peripheral elements will be described.

3661 As shown in FIG. 79, the left cup shutter H182L when viewed from the front has a shaft portion H182L1, a gear portion H182L2 provided at the upper end of the shaft portion H182L1, and a shutter arm portion extending forward from the center of the shaft portion H182L1. H182L3, a cup holding part H182L4 connected to the baffle arm part H182L3 and formed in a semi-cylindrical shape with a narrowed lower side, a baffle part H182L5 connected to the cup holding part H182L4 and extending obliquely to the left, from An arm portion H182L6 extends diagonally to the right rearward slightly below the middle of the shaft portion H182L1.

[0450]

3671 As shown in FIG. 80, the right cup baffle H182R when viewed from the front has, like the left cup baffle H182L, a shaft part H182R1, a gear part H182R2 provided at the upper end of the shaft part H182R1, and a slave shaft part. The baffle arm portion H182R3 extending forward from the center of H182R1 is connected to the baffle arm portion H182R3, and the cup holding portion H182R4 is formed in a semi-cylindrical shape with a narrowed lower side. The cup holding portion H182R4 is connected to the cup holding portion H182R4 and faces The baffle part H182R5 extends diagonally forward on the right, and the arm part H182R6 extends obliquely rearward on the left from slightly below the middle of the shaft part H182R1.

[0451]

3681 The shaft portion H182L1 of the left cup shutter H182L and the shaft portion H182R1 of the right cup shutter H182R are rotatably supported by the housing H160, and the gear portions H182L2 and H182R2 mesh with each other.

3684 Therefore, when the left cup shutter H182L is opened (rotated clockwise in Figure 79), the right cup shutter H182R will also be opened (rotated counterclockwise in Figure 80). When opened When the right cup baffle H182R is used, the left cup baffle H182L will also open.

[0452]

3690 As shown in Figure 78, a spring (tensile coil spring) H189 is installed between the arm portion H182L6 of the left cup baffle H182L and the arm portion H182R6 of the right cup baffle H182R. The elastic recovery of the

spring H189 is used. force, the left cup baffle H182L and the right cup baffle H182R are closed.

[0453]

3696 As shown in FIGS. 79 and 80, on the inner peripheral surface of the cup holding portion H182L4 of the left cup baffle H182L and on the inner peripheral surface of the cup holding portion H182R4 of the right cup baffle H182R, there are provided a height-direction extending A plurality of ribs H182L7 and H182R7 (two cup baffles H182L and H182R shown in Figures 79 and 80 are respectively provided).

3700 The ribs H182L7 and H182R7 support the cup W supplied to the cup baffles H182L and H182R with a small area to prevent the inner circumferential surface of the cup holding portion H182L4 and H182R4 from coming into contact with the cup body of the cup W, thereby preventing the cup W from coming into contact for some reason. Even when a drink adheres to the inner peripheral surface of the cup holding parts H182L4 and H182R4, the cup W will not be contaminated.

3705 For example, a total of four ribs H182L7 and H182R7 are provided to support the cup W at four points to ensure the stability of transportation.

[0454]

3710 As shown in FIG. 79, the upper and lower opposite holes H182L3 a are provided in the baffle arm portion H182L3 of the left cup baffle H182L, and the accessory H190 is detachably mounted thereon.

[0455]

3715 As shown in FIG. 80, in addition to the upper and lower square holes H182R3a, the baffle arm H182R3 of the right cup baffle H182R is also provided with a square hole H182R3b between the square hole H182R3a and the square hole H182R3a so that it can be attached and detached. installed with accessory H190.

[0456]

3721 The fitting H190 is symmetrical up and down, with claw portions H190a provided at one end and the other end, and a convex portion H190b provided between the claw portions H190a and the claw portions H190a.

[0457]

3726 As described above, the attachment H190 can be attached to the shutter arm portion H182L3 of the left cup shutter H182L and the shutter arm portion H182R3 of the right cup shutter H182R.

3728 As shown in FIG. 79, when the accessory H190 is attached to the baffle arm H182L3 of the left cup baffle H182L, the convex portion H190 b collides with the baffle arm H182L3, thereby determining the protruding amount of the accessory H190.

3731 On the other hand, as shown in FIG. 80, when the attachment H190 is attached to the baffle arm H182R3 of the right cup baffle H182R, the convex portion H190 b is inserted into the square hole H182R3 b, and the protruding amount of the attachment H190 is determined.

3734 Therefore, the attachment H190 has a large protrusion amount when attached to the left cup baffle H182L, and a small protrusion amount when attached to the right cup baffle H182R.

3736 This means that when the accessory H190 is installed on the left cup baffle H182L, the opening of the cup baffle is large, which is suitable for holding the cup W with a long cup body circumference.

3738 And it means that when the accessory H190 is installed on the right cup baffle H182R, the opening of the cup baffle is small, which is suitable for holding the cup W with a small cup body circumference.

[0458]

3743 <Suspended cup conveying mechanism H-2>

[0459]

3747 Next, the suspended cup conveying mechanism H-2 will be described with reference to FIGS. 81, 82, 83 and 84.

3749 This hanging cup conveying mechanism H-2 is mounted on, for example, a cup-type vending machine 1 classified as an ultra-small size.

3751 The cup-type vending machine 1 classified as ultra-small has the following structure: the position of the cup W corresponding to the cup supply mechanism C, the raw material supply mechanism D, the stirring mechanism J, and the outlet mechanism S is along the X direction (left-right direction).) is arranged in a linear shape and does not require movement in the Y direction (depth direction). In addition, the size of the cup W is limited to one type, and movement in the Z direction (height direction) corresponding to the size is not required. Therefore, the cup transport mechanism H-2 is a simple 1-axis (X-axis) movement mechanism.

[0460]

3761 The cup transport mechanism H-2 is a mechanism that moves the cup holding device H201 in the X direction.

3763 The cup holding device H201 is a mechanism that receives the cup W supplied from the cup supply mechanism C and holds the cup W at a cup receiving position directly below the cup supply mechanism C, and corresponds to the above-mentioned cup holding device H12 (see FIG. 77). However, structural elements related to the Z-axis operation such as the Z-axis drive motor H184 are omitted.

[0461]

3770 The take-out port mechanism S (see FIG. 84) is a place where the user takes out the cup W, and has a simple structure in which the take-out port door S10 is attached to a frame provided in the center of the front door 3.

3773 The outlet mechanism S corresponds to the outlet mechanism S described above (see FIG. 194), but the holder S14 on the back side is omitted, and the outlet mechanism S can be entered from the X direction.

[0462]

3778 FIG. 81 is a perspective view showing a state in which the cup holding device H201 is arranged (transported) to the cup receiving position (standby position) directly below the cup supply mechanism C. FIG. 82 is a perspective view showing the cup conveying mechanism H-2 that conveys the cup holding device H201. Stereo view.

[0463]

3785 The cup conveying mechanism H-2 has a cup holding device H201 and a track H202.

3786 The rail H202 extends in the X direction over substantially the entire internal width of the equipment housing 2. According to the sales preparation process, the cup holding device H201 is sequentially moved in the X direction by a sliding body on the lower surface (not shown).

3789 The cup holding device H201 is suspended relative to the sliding body, receives the cup W supplied from the cup supply mechanism C, and holds the cup W. The cup holding device H201 includes a table H181 for receiving the cup W supplied from the cup supply mechanism C and placing the cup W, and cup baffles H182L and H182R for holding the side walls of the received cup W. The table H181 and the cup shutters H182L and H182R are basically the same as the table H181 and the cup shutters H182L and H182R in the above-mentioned cup holding device H12 (see FIG. 77).

[0464]

3798 The cup baffles H182L, H182R and the table H181 of the cup holding device H201 are disposed below and in front of the rail H202, and can be appropriately adapted to the cup supply mechanism C, the raw material supply mechanism D, the mixing mechanism J, and the extraction port mechanism S. Configure the cup W you are holding.

[0465]

3805 The rail H202 has a cup conveying motor H203 at its end. When the cup conveying motor H203 is driven by the control unit R, the cup holding device H201 is conveyed in the move.

[0466]

3810 The cup conveying mechanism H-2 is provided with a powder tray H204.

3811 The powder tray H204 is used to catch the flying powder when the powder raw material is supplied from the raw material supply mechanism D to the cup W, the beverage splashing when the stirring paddle J10 of the stirring mechanism J is put into the cup W and then rotated to stir, etc. A receiving container to prevent contamination inside the device housing 2.

3815 The powder tray H204 is provided with a cup waste hole H204a for discarding the cup W suspended in the cup supply mechanism C into the waste cup container H205, and a hole edge H204b of the cup waste hole H204a.

3818 Furthermore, a residue holding container H208 is provided into which extracted residue and the like discharged from the brewing mechanism L are put.

[0467]

3823 83 is a diagram showing the arrangement positions of a pair of cup detection sensors H206 that detect the cup W supplied from the cup supply mechanism C to the cup holding device H201 and output the cup detection signal to the control unit R.

3826 As shown in the figure, the cup detection sensor H206 is a photoelectric detection sensor composed of a light-emitting element H206a and a light-receiving element H206b. When the light emitted from the light-emitting element H206a is blocked by the cup W supplied/dropped from the cup supply mechanism C, the control unit R can know that the cup W is supplied to the cup holding device H201. The light-emitting element H206a is installed on the inner surface of the left side wall of the equipment housing 2, and the light-receiving element H206b is installed on the inner surface of the right side wall of the equipment housing 2.

[0468]

3835 The heights of the light-emitting element H206a and the light-receiving element H206b are set between the table H181 and the cup baffles H182L and H182R. The optical axis will not be blocked by anything other than the cup W and can not be blocked by the table H181 and the cup baffles H182L and H182R. Affected areas only detect cup W.

[0469]

3842 The cup detection sensor H206 is equivalent to the above-mentioned take-out cup detection sensors S24a and S24b (see FIG. 195), but its installation position is different.

3844 The above-mentioned take-out spout cup detection sensors S24a and S24b only detect that the cup W is carried into the take-out spout mechanism S. On the other hand, the cup detection sensor H206 can detect that the cup W is carried into the take-out spout. It is reasonable that the cup W can be properly supplied to the cup holding device H201 from the cup supply mechanism C in the mechanism S and can be detected.

[0470]

3851 When the cup holding device H201 is arranged at a position other than the cup receiving position (for example, the powder raw material receiving position) directly below the cup supply mechanism C, when the cup supply mechanism C drops the cup W into the discarded cup container H205, the cup detection sensor H206 also Ability to detect this falling action.

[0471]

3858 In this structure, the operation of the cup-type vending machine 1 by the control unit R is briefly explained using the perspective view of FIG. Cup delivery control.

[0472]

3863 The cup holding device H201 is preliminarily arranged in a standby position directly below the cup supply mechanism C, that is, in a cup receiving position.

3865 By making the standby position and the cup receiving position the same position, the sales preparation time can be shortened.

3867 When the user of the cup vending machine 1 operates the operation input unit U1 to provide a cup supply instruction from the control unit R to the cup supply mechanism C, the drive device C40 is driven to supply cups W from the cup supply mechanism C.

3870 When the cup W supplied from the cup supply mechanism C falls to the cup holding device H201, the cup detection sensor H206 detects the cup W, and a cup detection signal is supplied to the control unit R.

[0473]

3875 When the control unit R receives the cup detection signal from the cup detection sensor H206 within a predetermined time after outputting the cup supply command to the cup supply mechanism C, it recognizes that the cup W supplied from the cup supply mechanism C is held by the cup holding device H201.

3879 Thereafter, the control unit R energizes the cup conveying motor H203 to sequentially move the cup holding device H201 to each arrangement position of the raw material supply mechanism D and the stirring mechanism J to cook the beverage in the cup W and convey it to the outlet mechanism S.

3882 When the cup W containing the beverage is transported to the outlet mechanism S and the user opens the outlet door S10 of the outlet mechanism S to take out the cup W containing the cooked beverage, the cup detection signal from the cup detection sensor H206 stop. Thereby, the cup holding device H201 is conveyed to the standby position by the cup conveying mechanism H-2 and then stops, and the cup vending machine 1 becomes a sales standby state.

[0474]

3890 In addition, when the cups W are dropped/supplied from the sales cup row WK of the cup supply mechanism C to the cup holding device H201, the following situation may occur: due to the influence of static electricity, the cups W remain in the cup supply mechanism C and become suspended. Drop to cup holding device H201.

3894 In this case, since the cup detection signal is not supplied from the cup detection sensor H206 within the predetermined time, the control unit R recognizes that the cup W is not supplied to the cup holding device H201.

[0475]

3900 In this case, the control unit R first moves the cup holding device H201 to a position other than the standby position directly below the cup supply mechanism C (for example, the powder raw material receiving

position).

[0476]

3906 Then, the control unit R outputs a cup supply command to the cup supply mechanism C again, and drops the cup W from the sales cup row WK again.

3908 As a result, a new cup W falls on top of the cup W that was suspended at the cup supply mechanism C after being released last time. Due to its impact and the dead weight of the two cups W, the suspended state is eliminated and the two cups W fall. To waste cup container H205.

3911 At this time, the two cups W block the optical axis of the light-emitting element H206a and the light-receiving element H206b only for a short period of time. Therefore, the control unit R can recognize that the two cups W are properly discharged based on the detection signal of the cup detection sensor H206. In addition, the cup detection sensor H206 may be shared with the above-mentioned cup drop detection sensor C38, or may be provided separately from the cup drop detection sensor C38.

[0477]

3919 On the other hand, the two cups W discharged from the cup supply mechanism C may rest on the edge H204b of the cup waste hole H204a.

3921 When moving the cup holding device H201 to the standby position, the control unit R can decelerate the cup holding device H201 in steps in front of the standby position, thereby appropriately guiding the cup W resting on the hole edge H204b to the cup waste hole H204a. Abandoned. In addition, the control unit R can also appropriately guide the cup W resting on the hole edge H204b to the cup waste hole H204a by temporarily stopping the cup holding device H201 in front of the standby position when moving the cup holding device H201 to the standby position. Abandoned. Furthermore, when moving the cup holding device H201 to the standby position, the control unit R can temporarily stop and reverse the cup holding device H201 in front of the standby position, and then move the cup holding device H201 to the standby position again, so that the cup holding device H201 can be placed on the edge of the hole H204b. The cup W is properly guided to the cup waste hole H204a for waste.

[0478]

3934 Through this operation, even if the cup W rests on the hole edge H204b, the cup W can be properly discarded without causing problems such as the cup W being crushed.

[0479]

3939 <Stirring mechanism J>

[0480]

3943 <Stirring mechanism J-1>

[0481]

3947 As shown in FIG. 85 , the stirring mechanism J-1 includes a stirring blade J10, a stirring blade rotating motor J11, and a stirring blade lifting motor J12.

3949 In addition, the stirring mechanism J-1 has a standby height detection switch (micro switch) J13, a stirring height detection sensor (light sensor) J14, a stirring paddle up and down guide J15, a hot water nozzle J16, a coffee supply nozzle J17, and a leaf tea supply nozzle. J18.

3952 The stirring mechanism J-1 is provided with an ice supply part (not shown).

[0482]

3956 The stirring paddle J10 is used to stir the beverage in the cup W and is installed at the lower end of the drive shaft J10a of the stirring paddle rotating motor J11. When the stirring paddle rotating motor J11 is rotated, the stirring paddle J10 rotates.

3959 The stirring paddle J10 exhibits good beverage stirring performance and is shaped to prevent the beverage from scattering during stirring.

[0483]

3964 The stirring paddle lifting motor J12 is used to raise and lower the stirring paddle J10 and the stirring paddle rotating motor J11 relative to the equipment housing 2 together.

3966 Specifically, the stirring paddle lifting motor J12 is installed in the equipment housing 2 and functions in the following manner: by rotating, the stirring paddle J10 and the stirring paddle rotation motor J11 are lowered from the standby height to the stirring height, and raised from the stirring height to Standby height.

[0484]

3972 When the stirring paddle J10 moves down and moves to the stirring height, the stirring height detection sensor J14 is turned on.

3974 When the stirring paddle J10 rises and moves to the standby height, the standby height detection switch J13 is turned on.

3976 The standby height detection switch J13 is also used to detect the origin position of the stirring paddle J10.

[0485]

3980 The stirring paddle up-and-down guide J15 guides the stirring paddle J10 and the stirring paddle rotation motor J11 to move up and down such that the position and posture are stable.

[0486]

3985 The hot water nozzle J16 is connected to the hot water tank F via the hot water supply pipe F11a, and has the

function of supplying hot water to the cup W and the function of supplying hot water to the stirring blade J10 for cleaning.

3988 The hot water nozzle J16 is set at a slightly higher position than the stirring blade J10, and can not only clean the stirring blade J10, but also the drive shaft J10a.

[0487]

3993 The coffee supply nozzle J17 and the leaf tea supply nozzle J18 are connected to the brewing mechanism L and can supply coffee and leaf tea to the cup W.

[0488]

3998 Just below the stirring mechanism J-1, the cup W is arranged through the cup holding device H12, the stirring paddle J10 can be inserted, and hot water, ice, coffee, leaf tea (and cold water can also be supplied depending on the specifications) can be supplied. The stirring mechanism Just below J-1 is used as a cooking position for cooking beverages.

[0489]

4005 The basic operation of the stirring mechanism J-1 is as follows.

[0490]

4009 That is, in the sales standby state, the stirring blade J10 is stopped at the standby height so that the standby height detection switch J13 is turned on.

4011 Then, when the cup W is transported to the cooking position, the stirring paddle J10 is lowered by the stirring paddle lifting motor J12, and the stirring paddle J10 is stopped at the moment when the stirring height detection sensor J14 is turned on.

4014 After pouring hot water, ice, coffee, or leaf tea into the cup W according to the type of beverage, the stirring paddle J10 is rotated by the stirring paddle rotation motor J11 to cook the beverage.

4016 The rotation speed and rotation time of the stirring paddle rotating motor J11 at this time can be arbitrarily adjusted by setting the stirring control unit (not shown).

[0491]

4021 Thereafter, the stirring blade lifting motor J12 is reversely rotated to raise the stirring blade J10, and the stirring blade J10 is cleaned using the hot water discharged from the hot water nozzle J16.

4023 Then, the stirring paddle lifting motor J12 is stopped at the timing when the standby height detection switch J13 turns on.

4025 After the cup W is moved from the cooking position, the stirring blade J10 and the drive shaft J10a are lowered and hot water is applied for cleaning.

4027 In the case of a hot drink, hot water cleaning is performed as the stirring paddle J10 rises, and the cleaning hot

water is injected into the cup W. In the case of a cold drink, the stirring paddle J10 is temporarily raised and the cup W is retracted., lower the stirring paddle J10 to perform cleaning and discharge the cleaning hot water.

[0492]

4034 The operation of the stirring mechanism J-1 will be described in further detail.

[0493]

4038 When the cup W receives the powdered raw material from the chute D20, the stirring paddle J10 descends and rotates to perform stirring to avoid incomplete dissolution of the powdered raw material.

4040 Then, when hot water, ordinary coffee, leaf tea, etc. are poured into the cup W, the cup transport mechanism H-1 (refer to FIG. 76) moves the cup W to the outlet mechanism S which is a sales position.

[0494]

4045 When the beverage to be sold is leaf tea with sugar or cream, before moving the cup holding device H12 (see FIG. 77) to the cooking position, the stirring blade J10 is lowered and the hot water valve is opened, thereby flushing Stirring paddle J10.

[0495]

4051 Specifically, the stirring paddle lift motor J12 is driven to lower the stirring paddle J10 and open the hot water valve.

4053 Then, the stirring blade J10 is lowered, and hot water (powder hot water) is supplied from the hot water supply pipe F11a, and is flushed.

4055 Then, when the preset time elapses, the hot water valve is closed.

4056 After that, the stirring paddle lifting motor J12 is driven, and the stirring paddle J10 rises.

4057 Then, when the standby height detection switch J13 turns on, the stirring blade lifting motor J12 is stopped.

[0496]

4061 When the drink to be sold is a sugar-added drink, the screw motor D31 of the tank D10 containing the sugar is driven to discharge the sugar from the tank D10 to the chute D20.

4063 Then, the discharged sugar is temporarily accommodated in the chute D20.

[0497]

4067 Similarly, when the drink to be sold is a drink with cream, the screw motor D31 of the tank D10 containing the cream powder is driven to discharge the cream powder from the tank D10 to the chute D20.

4069 The discharged cream powder is temporarily accommodated in the chute D20.

[0498]

4073 When the beverage to be sold is ordinary coffee, coffee beans are supplied from the tank D10 to the grinder K by driving the screw motor D31 of the tank D10 containing coffee beans that are raw materials of ordinary coffee.

4076 The coffee beans supplied to the grinder K are sent to the grinding blade by the auger screw D19 in the chute D20, and are thereby crushed into powdered beans. The ground coffee beans are supplied to the brewing mechanism L (refer to Fig. 98) and hot water supplied from the hot water tank F is injected, thereby extracting ordinary coffee.

[0499]

4083 When the beverage to be sold is leaf tea, the screw motor D31 of the tank D10 containing the tea leaves is driven, so that the tea leaves are supplied from the tank D10 to the grinder K.

4085 The tea leaves supplied to the grinder K are sent to the grinding blade by the auger screw D19 in the chute D20, and are thereby crushed. The crushed tea leaves are supplied to the leaf tea brewing machine and hot water supplied from the hot water tank F is injected, thereby extracting the leaf tea.

[0500]

4091 When the beverage to be sold is determined, the cup transport mechanism H-1 drives the XY stage H10 to move the cup holding device H12 from the predetermined standby position to the cup supply position.

4093 When the cup holding device H12 moves to the cup supply position, the cup supply mechanism C supplies the cup W to the cup holding device H12.

[0501]

4098 Then, when the beverage to be sold is a sugar-added beverage, the cup holding device H12 is moved to a receiving position for receiving the sugar (under the chute D20 that temporarily receives the sugar), whereby the casing H160 of the cup holding device H12 is moved. The lever part D53a of the selector lever D53 moves backward (rightward in FIG. 40).

4102 As a result, the gate D22 is opened, and the sugar is discharged from the chute D20 to the cup W.

[0502]

4106 When the drink to be sold is a drink with cream, the cup holding device H12 is moved to the receiving position for receiving cream (below the chute D20 that temporarily accommodates the cream). Similarly, the gate D22 is opened, and the gate D22 is opened. Slot D20 releases cream to cup W.

[0503]

4112 If the beverage to be sold is ordinary coffee, then the cup holding device H12 is moved to the cooking position and ordinary coffee is poured into the cup W.

4114 When sugar or cream is added to the ordinary coffee to be sold, the stirring paddle J10 is lowered and rotated to stir the ordinary coffee, thereby preventing incomplete dissolution of the sugar and cream.

[0504]

4119 If the beverage to be sold is leaf tea, then the cup holding device H12 is moved to the cooking position and the leaf tea is poured into the cup W.

4121 When sugar or cream is added to the leaf tea to be sold, the stirring paddle J10 is lowered and rotated to stir the leaf tea, thereby preventing incomplete dissolution of the sugar or cream.

[0505]

4126 When the beverage is poured into the cup W, the cup transport mechanism H-1 drives the XY stage H10 to move the cup holding device H12 from the cooking position to the sales position.

[0506]

4131 When the cup holding device H12 moves to the outlet mechanism S (see FIG. 195), the cup W in which the beverage is poured can be taken out of the machine by opening the outlet door S10.

[0507]

4136 <Stirring mechanism J-2>

[0508]

4140 Next, the stirring mechanism J-2 according to the modified example will be described with reference to FIGS. 86 and 87.

4142 In the stirring mechanism J-2, the same components as those of the above-mentioned stirring mechanism J-1 are denoted by the same reference numerals, and detailed descriptions thereof are omitted.

[0509]

4147 As shown in Figures 86 and 87, the stirring mechanism J-2 according to the modified example includes a stirring paddle J10, a stirring paddle rotating motor J11, a stirring paddle lifting motor J12, a standby height detection switch J13, a stirring height detection sensor J14, and a stirring paddle. Upper and lower guide J15, hot water nozzle J16, coffee supply nozzle J17.

[0510]

4154 In addition, the stirring mechanism J-2 is provided with a cover J19.

4155 Cover J19 covers the stirring paddle rotation motor J11, the stirring paddle lifting motor J12, the standby height detection switch J13, the stirring height detection sensor J14, and the stirring paddle up and down guide J15 to protect these mechanisms from contamination.

4158 The mixing mechanism J-2 is provided with an ice cube introduction chute J20.

4159 The ice cube introduction chute J20 is connected to the ice supply passage G1 of the ice machine G.

4160 Although not shown explicitly in the figure, in the ice introduction chute J20, the part where the ice comes into contact has a wavy shape to prevent ice from clogging.

[0511]

4165 In the cooking position directly below the stirring mechanism J-2, the stirring paddle J10 can be inserted and hot water, ice, coffee, leaf tea (and cold water can be supplied depending on the specifications) can be supplied, thereby cooking beverages.

[0512]

4171 <Grinder K>

[0513]

4175 Figures 88, 89 and 90 show a grinder K as a grinding device for extracting raw materials such as coffee.

4176 This grinder K is built into a cup vending machine 1, a beverage dispenser, etc., and when extracting coffee, it grinds coffee beans as raw materials for each cup of coffee to generate coffee powder (powder raw material).

[0514]

4181 As shown in FIGS. 88 and 90, the grinder K has a grinder main body K2 for grinding coffee beans at the center, a motor K3 for driving the grinder main body K2 is disposed on the rear side, and a motor K3 is disposed on the front side for driving the grinder main body K2. A powder raw material supply part K4 is disposed to supply coffee powder sent out from the grinder main body part K2 to the brewing machine L1 below (refer to FIG. 98).

4186 In addition, the casing K1 constituting the casing of the grinder K is formed by assembling a plurality of casing members to each other, and the above-mentioned grinder main body K2 and the motor K3 are assembled to the casing K1 as appropriate.

4189 In addition, the cylindrical portion K4a provided at the left end portion of the powder raw material supply portion K4 is configured to communicate the inside and outside of the casing K1, and is used, for example, to release the smell of coffee powder generated when coffee beans are ground to the outside.

[0515]

4195 Fig. 91 shows the internal structure of the grinder K.

4196 As shown in this figure, the grinder main body K2 has a fixed grinding part K6, which is assembled in the housing K1 with the upper half protruding above the housing K1 and does not move when the grinder K is operating; and a rotating grinding part K7. , which is built into the housing K1 and rotates when the grinder K is working.

[0516]

4203 As shown in FIG. 92 , the stationary grinding part K6 has a hopper K11 formed in a cylindrical shape extending in the up and down direction and receiving coffee beans thrown in from above; and a coarse grinding ring K12 threadedly fixed in the hopper K11 The lower part is used to crush coffee beans into a relatively coarse state (hereinafter referred to as "coarse crushing"); and the upper fine crushing ring K13 is threadedly fixed to the lower surface of the coarse crushing ring K12 and is used to connect with the rotating grinding part K7 The lower fine grinding ring K25, described later, cooperates to grind the coarsely ground coffee beans into a finer state (hereinafter referred to as "fine grinding").

[0517]

4213 The hopper K11 is made of a plastic molded product, and a gear portion K14 is provided on its outer peripheral surface at a position slightly higher than the center in the up-down direction.

4215 Moreover, the external thread part K15 is formed in the lower half part of the outer peripheral surface of the hopper K11, and the hopper K11 is attached to the casing K1 in the state which screwed this external thread part K15.

4218 Therefore, as shown in Fig. 88 and others, by appropriately rotating the particle size adjustment screw K10 having the worm gear K10a meshing with the gear portion K14, the immovable grinding portion K6 is raised and lowered while rotationally moving relative to the casing K1, thereby adjusting the insufficiency. The gap between the upper fine grinding ring K13 of the movable grinding part K6 and the lower fine grinding ring K25 of the rotating grinding part K7.

4223 Thereby, the particle size of the coffee beans crushed by the upper grinding ring K13 and the lower grinding ring K25 can be easily adjusted.

[0518]

4228 The coarse crushing ring K12 is made of a predetermined metal (for example, aluminum or its alloy), and is formed in a cylindrical shape with a relatively thick peripheral wall.

4230 A crushing convex portion K18 is provided at the bottom of the coarse crushing ring K12. The crushing convex portion K18 extends over the entire circumferential direction of the coarse crushing ring K12 and protrudes inward. It cooperates with the raw material feeder K21 described below to crush the coffee beans. Coarsely chopped.

4234 The crushing convex portion K18 is configured to protrude at a predetermined distance smaller than the particle size of the coffee beans from the raw material feeder K21.

[0519]

4239 In addition, the crushing convex portion K18 has a predetermined thickness, and its upper surface K18a is formed along a plane orthogonal to the raw material feeder K21 extending in the up-down direction, and its front end surface is connected to the upper surface K18a and faces the raw material feeder K21. K18b forms a right-angled corner with the upper surface K18a.

4243 In addition, the crushing convex part K18 is provided with a plurality of (12 in this embodiment) recessed parts K18c formed in a concave shape along the circumferential direction thereof.

4245 As shown in FIGS. 90 and 92, each recessed portion K18c is formed to open between the upper surface K18a and the front end surface K18b of the crushing convex portion K18.

[0520]

4250 In addition, on the inner surface of the coarse crushing ring K12, a plurality of (12 in this embodiment) recessed portions K19 are formed in the circumferential direction above the crushing convex portion K18.

4252 As shown in FIGS. 90 and 92, each recess K19 is formed to open from the upper surface of the coarse crushing ring K12 to the inner surface. The inner surface of each recess K19 is composed of a triangular triangular surface K19 a and an arc surface K19 b. The surface K19a is formed substantially along the radial direction of the coarse crushing ring K12, and the arcuate surface K19b is connected to the triangular surface K19a and is formed to extend in an arc shape in the counterclockwise direction.

[0521]

4260 As will be described later, when the coffee beans are ground, the raw material feeder K21 rotates in the counterclockwise direction, thereby causing the coffee beans around the raw material feeder K21 to move in the same counterclockwise direction as the raw material feeder K21. However, the coffee beans collide with the inner surfaces of the recessed portion K19 (triangular surface K19a) and the recessed portion K18c of the crushing convex portion K18, thereby suppressing movement and slippage of the coffee beans in the circumferential direction.

4266 Thereby, the coffee beans can be efficiently sent downward through the raw material feeder K21, and coarse grinding can be performed efficiently.

[0522]

4271 The upper fine grinding ring K13 is made of a predetermined metal (for example, stainless steel), and is formed to be vertically symmetrical with the lower fine grinding ring K25.

4273 The upper fine crushing ring K13 has an inner diameter slightly larger than the inner diameter of the crushing convex portion K18 of the coarse crushing ring K12, and has an outer diameter slightly larger than the outer diameter of the coarse crushing ring K12. In addition, the upper fine crushing ring K13 is formed to gradually become thicker from the inside to the outside, and a large number of knives (not shown) extending in the radial direction and arranged in the circumferential direction are formed on the crushing surface K13a of the inclined lower surface. .

[0523]

4282 Fig. 93(a) shows the rotary polishing part K7 and its surroundings, Fig. 93(b) only shows the rotary polishing part K7, and Fig. 94 shows the elements of Fig. 93(a) exploded.

4284 As shown in these figures and Figure 91 , the rotary grinding section K7 has a raw material feeder K21 extending in the up and down direction and sending coffee beans put into the hopper K11 downward; and a grinder gear K23 fixed to the raw material feeder K21 The lower part of the rotating shaft K22; the powder raw material collecting/discharging plate K24 (powder raw material collecting/discharging part), which is fixed above the grinder gear K23 of the rotating shaft K22; and the lower fine crushing ring K25 (rotating crushing part) , its thread is fixed on the powder raw material collection/ejection plate K24.

[0524]

4293 The raw material feeder K21 is made of a predetermined metal (for example, aluminum or its alloy), and has a rotating part K21a formed in a cylindrical shape extending a predetermined length in the up-down direction, and a spiral convex part K21b from The outer circumferential surface of the rotating portion K21a protrudes by a predetermined length and extends in a spiral shape from the upper end of the rotating portion K21a to the lower end of the rotating portion K21a once in the clockwise direction.

4298 Furthermore, this raw material feeder K21 is fixed to the rotating shaft K22 in the following manner: the rotating shaft K22 extending in the up-down direction is inserted into the rotating part K21a from below, and the upper end part of the rotating shaft K22 protrudes upward from the upper end of the rotating part K21a. Tighten the nut K21c thread. Furthermore, the rotating shaft K22 is rotatably supported at its lower end and at a position slightly lower than the center in the up-down direction via bearings K22a, K22a fixed in the housing K1.

[0525]

4307 The grinder gear K23 is composed of a helical gear having a relatively large diameter. As shown in FIG. 91 , the grinder gear K23 is fixed between the upper and lower bearings K22a and K22a of the rotating shaft K22.

4309 In addition, the grinder gear K23 meshes with the intermediate gear K32, and the intermediate gear K32 meshes with the drive gear K31 fixed to the output shaft of the electric motor K3. The drive unit is composed of a motor K3, a drive gear K31, an intermediate gear K32, a grinder gear K23, a rotation shaft K22, etc.

[0526]

4315 When grinding coffee beans, the ground material collection/discharge plate K24 collects the coffee powder sent to the powder delivery path K26 mentioned later, and discharges it toward the front ground material supply part K4 side.

4318 The powder raw material collecting/discharging plate K24 is formed in a disk shape with a diameter one circle larger than the outer diameter of the lower fine crushing ring K25, and is provided on its outer peripheral portion with equal angles (60°) along the circumferential direction relative to the center.) are arranged and six blade portions K24a (movable portion) protrude upward. In addition, a passage wall ring K27 (passage

wall) fixed in the casing K1 is arranged on the side of the blade portion K24a of the powder raw material collection/ejection plate K24, and the passage wall ring K27 is connected with the upper fine crushing ring K13 and the lower fine crushing ring K27. A powder delivery passage K26 is defined between the outer peripheral surfaces of the ring K25.

[0527]

4329 The passage wall ring K27 is made of a metal containing aluminum as a main component, such as aluminum or an alloy thereof, and is formed in a cylindrical shape having an inner diameter slightly larger than the outer diameter of the powder raw material collection/discharge plate K24.

4332 As shown in Fig. 94, the front portion of the passage wall ring K27 is provided with a discharge port K27a that communicates the inside and outside of the passage wall ring K27, and the rear portion of the passage wall ring K27 is provided with an outlet K27a protruding rearward for electrical grounding. The spring locking portion K27b is a spring locking portion K27b in which one end of the connection spring K29 described later is locked. The passage wall ring K27 configured in this way is fixed in the casing K1 in such a manner that the inner circumferential surface of the passage wall ring K27 faces the outer circumferential surfaces of the upper fine crushing ring K13 and the lower fine crushing ring K25 and completely surrounds the outer peripheral surfaces. Therefore, between the outer peripheral surfaces of the upper fine grinding ring K13 and the lower fine grinding ring K25 and the inner peripheral surface of the passage wall ring K27, a gap between the upper fine grinding ring K13 and the lower fine grinding ring K25 is defined when coffee beans are ground. The annular powder delivery passage K26 is used to deliver coffee powder.

[0528]

4346 In addition, a guide member K28 that guides coffee powder discharged substantially horizontally from the discharge port K27a downwards to the discharge port K27a of the passage wall ring K27 is connected.

4348 This guide member K28 is made of a molded product made of polyacetal, and is formed into a predetermined shape open from the back surface to the lower surface. Furthermore, a cylindrical chute K36 extending a predetermined length in the up-down direction is connected to the lower side of the guide member K28.

[0529]

4355 Furthermore, a connection spring K29 for electrically connecting the passage wall ring K27 and the metal housing K3a constituting the housing of the motor K3 is engaged with the spring locking portion K27b of the passage wall ring K27.

4358 This connection spring K29 is composed of a metal coil spring. One end is inserted into the spring locking portion K27b of the passage wall ring K27, and the other end is in contact with the casing K3a of the motor K3. Moreover, the housing K3a of the electric motor K3 is provided with a connection part K3b, and the terminal K30a of the ground wire K30 is connected to this connection part K3b. As described above, the passage wall ring K27 is electrically connected to the connection spring K29, the casing K3a of the motor K3, and the ground wire K30 in this order, and is thereby grounded. The grounding unit is composed of the

connection spring K29, the casing K3a of the motor K3, the ground wire K30, etc.

[0530]

4368 Next, the grinding operation of coffee beans in the grinder K configured as above will be described with reference to FIG. 95.

4370 Moreover, this grinder K is installed below the tank D10 which supplies coffee beans before grinding, and the raw material chute extended downward from a coffee bean supply device is connected to the hopper K11. In addition, the coffee bean supply device can supply coffee beans of different types and roasting degrees (for hot coffee, for iced coffee, etc.) to the grinder K.

[0531]

4377 First, a predetermined amount of coffee beans is put into the hopper K11 of the grinder K from the coffee bean supply device via the raw material chute.

4379 Before and after it, the electric motor K3 works to rotate the grinder gear K23 with the help of the drive gear K31 and the intermediate gear K32. Thereby, the rotation shaft K22 of the rotating grinding part K7 rotates in the counterclockwise direction, and accordingly, the raw material feeder K21, the powder raw material collecting/discharging plate K24, and the lower fine grinding ring K25 also rotate in the counterclockwise direction.

[0532]

4387 The coffee beans put into the hopper K11 fall down and reach the raw material feeder K21 as shown by the black arrow on the upper side in Figure 95.

4389 As the raw material feeder K21 rotates in the counterclockwise direction, the coffee beans that have reached the upper end of the raw material feeder K21 are sent downward. In this case, the spiral convex portion K21b of the raw material feeder K21 cooperates with the crushing convex portion K18 of the coarse crushing ring K12 to coarsely crush the coffee beans.

[0533]

4396 Specifically, the pressing force exerted from above by the spiral convex part K21b acts on the coffee beans around the raw material feeder K21, and the coffee beans are pushed from above to the front end of the crushing convex part K18 of the coarse crushing ring K12, thereby Been cut off.

4399 Thereby, the coffee beans coarsely ground into a size that can pass between the raw material feeder K21 and the grinding convex part K18 pass through the raw material feeder K21 as shown by the black arrow on the lower side in FIG. 95 The space between K21 and the upper fine crushing ring K13 is sent between the upper fine crushing ring K13 and the lower fine crushing ring K25.

[0534]

4406 The coffee beans that have been coarsely ground as described above are conveyed in the radial direction by the centrifugal force generated by the rotating lower fine grinding ring K25, and are crushed by the grinding surfaces K13a, K25a of the upper fine grinding ring K13 and the lower fine grinding ring K25. Finer, that is, finely crushed.

4410 The coffee powder generated by this fine grinding is sent out from between the upper fine grinding ring K13 and the lower fine grinding ring K25 to the powder feed passage K26. In addition, in this case, as the powder raw material collection/discharge plate K24 rotates, the plurality of blade portions K24a move in a circle within the powder delivery passage K26. Through these blade portions K24a, the coffee powder in the powder delivery passage K26 is moved. While collecting, as shown by the hollow arrow on the upper side in Fig. 95, it is discharged forward from the discharge port K27a of the passage wall ring K27. Then, the ejected coffee powder collides with the inner surface K28a of the guide member K28, and is thereby turned downward as shown by the hollow arrow on the lower side in Fig. 95, and is supplied to a lower not-shown coffee ground via the chute K36. Coffee extractor.

[0535]

4422 As described above, according to the grinder K, the coffee beans are coarsely ground before being finely ground. Therefore, compared with the case where the coffee beans are directly ground into fine grinders, the fluctuation of the drive load of the motor K3 can be suppressed.

4425 As a result, coffee beans can be ground sufficiently and stably to produce coffee powder with a substantially uniform particle size. In addition, as the motor K3, a motor with a small output torque, that is, a small size and an inexpensive motor can be used, so that the entire device can be manufactured. Compact and low-cost grinder K.

[0536]

4432 Next, a method for removing static electricity (static discharge) generated inside the grinder K when grinding coffee beans will be described.

4434 When coffee beans are ground using the grinder K as described above, static electricity is generated inside the grinder K due to friction with the coffee beans and coffee powder. Specifically, the raw material feeder K21, the coarse crushing ring K12, the upper fine crushing ring K13, the lower fine crushing ring K25, and the passage wall ring K27 have one polarity of positive or negative electricity. On the contrary, the generated coffee The powder has the other polarity of positive and negative charges.

[0537]

4442 FIG. 96 shows an example of the charging sequence.

4443 From this charging sequence, it is clear that iron and aluminum tend to become negatively charged due to friction with coffee beans, while coffee beans tend to become positively charged. Therefore, when coffee beans are ground in the grinder K, the raw material feeder K21, the coarse grinding ring K12, the upper fine grinding ring K13, the lower fine grinding ring K25, and the passage wall ring K27 made of stainless steel or aluminum are negatively charged, The resulting coffee grounds are positively charged. In particular, the

coffee powder sent out from the upper fine grinding ring K13 and the lower fine grinding ring K25 to the powder delivery passage K26 is pushed to the inner surface of the passage wall ring K27 by the blade portion K24a that rotates in the powder delivery passage K26. The state is collected while sliding, so a relatively large friction force is generated. As a result, the charge amount of the coffee powder and the passage wall ring K27 is relatively large.

[0538]

4456 As mentioned above, in the grinding machine K, the passage wall ring K27 is grounded. Therefore, as shown by the dotted arrow in FIG. 97, in the negatively charged passage wall ring K27, most of its negative charge passes through the connecting spring K29, The casing K3a of the motor K3 and the ground wire K30 are removed.

4460 In addition, in this case, the coffee powder sent out from the upper and lower fine grinding rings K13, K25 to the powder delivery passage K26 functions as a conductor connecting the two fine grinding rings K13, K25 and the passage wall ring K27, thereby raw material Most of the negative charges of the feeder K21, the coarse crushing ring K12, the upper fine crushing ring K13, and the lower fine crushing ring K25 are also removed via the passage wall ring K27, the connection spring K29, the casing K3a of the motor K3, and the ground wire K30.

[0539]

4469 On the other hand, as mentioned above, the positively charged coffee powder is ejected forward through the ejection port K27a of the passage wall ring K27, hits the inner surface K28a of the guide member K28, and then turns downward.

4472 As mentioned above, the guide member K28 is composed of polyacetal, and in the charging sequence shown in FIG. 96, polyacetal has a greater tendency to be positively charged than coffee beans. Therefore, the positively charged coffee powder becomes relatively negatively charged by the friction caused by contact with the inner surface K28a of the guide member K28. In other words, the charge amount (potential) of the originally positively charged coffee powder decreases. In addition, in this case, the guide member K28 is positively charged according to the amount of decrease in the charge amount of the coffee powder.

[0540]

4481 According to the above, the coffee powder and the guide member K28 are both charged with the same polarity, that is, positively charged. Therefore, there is a repulsive force between the coffee powder and the guide member K28. Therefore, the coffee powder is difficult to adhere to the inner surface K28a of the guide member K28 and is attracted. It is guided smoothly to the subsequent chute K36, which is further guided to the coffee extractor below it.

4486 In addition, since the coffee powder is in a state close to electrical neutrality, it is easily mixed with water (including hot water) during subsequent coffee extraction. As a result, coffee extraction efficiency is improved.

[0541]

4492 As described in detail above, according to the grinder K, the charge amount inside the grinder K can be reduced by eliminating static electricity, and an increase in the charge amount of the coffee powder charged by sliding along the passage wall ring K27 can be suppressed.

4495 Thereby, the adhesion/residue of coffee powder inside the grinder K can be significantly reduced, and the coffee powder can be ejected from the grinder K with high precision.

[0542]

4500 <Brewing mechanism L>

[0543]

4504 Hereinafter, preferred embodiments of the brewing mechanism L will be described in detail with reference to the accompanying drawings.

4506 FIG. 98 is a diagram schematically showing the internal structure of a cup-type vending machine equipped with a filter-type brewing mechanism, and FIG. 99 is a schematic diagram illustrating the interior of a cup-type vending machine equipped with a permanent filter-type brewing mechanism. Constructed graph.

4509 These cup-type vending machines 1LA and 1LB use a brewing mechanism L (beverage extraction device) to extract coffee using coffee beans and hot water (cold water), and provide users with ordinary coffee in cups.

[0544]

4514 The filter paper type brewing mechanism L is a type that filters the extracted coffee using a filter paper LP and a filter L72 described later. On the other hand, the permanent filter type brewing mechanism L filters the extracted coffee using only the filter L72. Type of coffee filtered.

[0545]

4520 In addition, in the description of this item <Brewing mechanism L>, when distinguishing between the filter paper type and the permanent filter type brewing mechanism L, they are appropriately called "paper brewing machine LA" and "mesh brewing mechanism L" respectively. Brewing Machine LB".

4523 In addition, let a cup-type vending machine equipped with a paper brewing machine LA be a cup-type vending machine 1LA, and a cup-type vending machine equipped with a mesh brewing machine LB be a cup-type vending machine 1LB. Representatively speaking, Set to cup vending machine 1.

[0546]

4529 As shown in FIGS. 98 and 99 , the cup-type vending machine 1 is provided with: a brewing mechanism L; and tanks D10 and A warm water tank F; a mixing bowl M that mixes the coffee extracted by the brewing mechanism L with cream and sugar; and a powder raw material supply mechanism D-1 that supplies cream

and sugar to the mixing bowl M.

4533 In addition, as shown in Fig. 100, they are controlled by a control unit including a microcomputer.

4534 In addition, when hot water, powdery raw materials, etc. can be stirred appropriately at the cooking position where the cup W is arrange|positioned, the mixing bowl M can be omitted. The tank D10, the warm water tank F, the mixing bowl M, and the powder raw material supply mechanism D-1 will be described separately.

[0547]

4541 Next, the brewing mechanism L will be described in detail.

4542 Figure 100 shows the paper brewer LA and Figure 101 shows the mesh brewer LB. As shown in the two figures, the paper brewing machine LA and the mesh brewing machine LB have roughly the same brewing machine body L20 that actually extracts coffee. The paper brewing machine LA has a filter paper described below installed on the brewing machine body L20. The delivery device L201, on the other hand, the mesh brewing machine LB is composed only of the brewing machine body L20.

[0548]

4550 102 and 103 show the paper brewing machine LA disassembled into units described below.

4551 In addition, in the following description, first, the brewing machine body L20 common to the two brewing machines LA and LB will be described, and the differences between the two brewing machines LA and LB will be included in the description. Then, the paper brewing machine LA will be described. Filter paper delivery device L201.

[0549]

4558 The brewing machine main body L20 is composed of a drip unit L21 for extracting coffee and a main body driving unit L22 that drives the drip unit L21.

4560 The main body drive unit L22 is fixed in the cup vending machine 1 by screw fastening or the like, and the drip unit L21 is detachably attached to the main body drive unit L22.

[0550]

4565 The drip unit L21 is composed of a cylinder L23 (extraction container), which is supplied with raw materials and hot water and is used to extract coffee inside, and a cylinder stand L24 for detachably accommodating the cylinder L23.

[0551]

4571 FIG. 104 shows a state in which the cylinder L23 is removed from the cylinder frame L24.

4572 The cylinder L23 is made of plastic, and is formed in a cylindrical shape with prescribed dimensions (for example, height: 102 mm, volume: 328 ml), extending in the up-down direction and having an open upper

surface and lower surface, as shown in this figure and Figure 105 .

4575 In addition, a handle L25 and a guide portion L26 used when the cylinder L23 is attached to or detached from the cylinder frame L24 are provided on the outer peripheral surface of the cylinder L23. The guide part L26 is composed of two upper and lower guide parts L26 and L26 that are provided at a predetermined interval from each other in the vertical direction and are formed to be vertically symmetrical.

[0552]

4582 In addition, a hot water guide wall L27 for guiding hot water supplied to the cylinder L23 along the circumferential direction of the inner surface is provided on the inner surface of the cylinder L23.

4584 As shown in FIG. 105 , the hot water guide wall L27 is provided along the inner surface of the cylinder L23 between the upper end vicinity of the cylinder L23 and the center portion in the vertical direction, and protrudes slightly inward, and is formed in a shape toward the handle L25 in plan view. A U-shape with an open side. Furthermore, a hot water diffusion convex portion L28 is provided on the inner surface of the cylinder L23 for causing the hot water flowing downward along the inner surface of the cylinder L23 to circulate along the lower half of the cylinder L23 in the circumferential direction. diffusion. The hot water diffusion convex portion L28 protrudes inwardly in a tapered shape by a predetermined length from the vertical center portion of the cylinder L23 and extends in the entire circumferential direction of the cylinder L23.

[0553]

4596 As shown in FIG. 106 , the cylinder frame L24 is formed in a box shape with a cylinder housing portion L24 a inside, and is provided with the following components: a filter block L32 , which is elevatingly installed at the lower portion of the inside of the cylinder frame L24 for holding the cylinder L23 . The coffee inside is conveyed to the outside while being filtered; the jar catcher L34 holds the jar L23 accommodated in the jar accommodating part L24a in a state of clamping the jar L23 from the left and right; and the front cover L35 is rotated at the upper end. It is freely supported and used to open and close the front surface of the cylinder frame L24.

[0554]

4606 In addition, the outer shell of the cylinder frame L24 includes left and right side walls L41, L41 facing each other at a predetermined interval, a back wall L42 provided so as to span between the rear end portions of the side walls L41, L41 and cover the upper half thereof. In addition, the front surface, the upper surface, and the lower half of the rear surface of the cylinder frame L24 are open across the bottom wall L43 and the like provided so as to span between the lower ends of the side walls L41 and L41.

4611 In addition, although not shown in the figure, the bottom wall L43 is formed in a lattice shape using a plurality of rod-shaped members.

4613 In addition, a front upper cover L36 is provided at the upper portion of the left and right side walls L41 and L41 at a position closer to the front end to connect the two side walls L41 and L41. A cover is detachably attached to the rear of the front upper cover L36. The frame cover L37 on the upper surface of the cylinder

frame L24.

[0555]

4620 Furthermore, guide rollers L38 and L39 for guiding the filter paper LP are detachably attached to the front and rear end portions of the left and right side walls L41 and L41 respectively at predetermined positions in the lower portion.

4623 These guide rollers L38 and L39 extend in the left-right direction across between the left and right side walls L41 and L41, and are rotatably supported by the two side walls L41 and L41. In addition, the two guide rollers L38 and L39 are attached to the cylinder frame L24 (refer to FIG. 102) of the paper brewing machine LA, and are detached in the mesh brewing machine LB.

[0556]

4630 The left and right side walls L41 and L41 of the cylinder frame L24 each include a box-shaped side wall main body L44 whose side surface is formed in a substantially rectangular shape and whose outer side is open; and a cover L45 which covers the open side of the side wall main body L44. The side is threadedly fixed to the side wall body L44.

4634 Furthermore, as shown in FIG. 107, a cylinder opening and closing mechanism L51 is provided in each side wall L41. The cylinder opening and closing mechanism L51 drives the filter block L32 and the cylinder head L101 to be described later to open and close the lower surface and the lower surface of the cylinder L23 respectively. upper surface. In addition, the left and right cylinder opening and closing mechanisms L51, L51 are configured to be substantially symmetrical in the left and right side walls L41, L41. Therefore, in the following description, the cylinder opening and closing mechanism L51 built in the right side wall L41 is centered. to explain.

[0557]

4644 As shown in FIGS. 107, 108, and 109, the cylinder opening and closing mechanism L51 includes a cam disc L55 that is rotatably supported by a support shaft L44 a protruding near the center of the upper half of the side wall body L44. It has a first cam groove L53 and a second cam groove L54; a sliding member L56 is slidably disposed in the lower half of the side wall body L44 along the up and down direction, and engages with the first cam groove L53 of the cam disc L55. And it is connected to the filter block L32; and the cylinder head locking member L57 is rotatably supported on the support shaft L44b protrudingly provided at a predetermined position in the upper part of the side wall body L44, and is engaged with the second cam groove L54 of the cam disc L55. to lock the cylinder head L101 described below in a state of being pressed against the upper surface of the cylinder L23.

[0558]

4656 The cam disc L55 is formed in a disc shape having a predetermined diameter and thickness, and a gear portion L55a is formed on the entire circumferential surface.

4658 In addition, a convex portion L55b slightly protruding in the radial direction is provided at a substantially 1/2 arc portion of the peripheral portion of the cam disc L55 on the cover L45 side.

4660 Furthermore, a first cam groove L53 and a second cam groove L54 are provided on the side surface of the cam disc L55 on the side wall body L44 side.

[0559]

4665 As shown in FIG. 110, the first cam groove L53 includes an outer cam portion L61 which is provided on the peripheral portion of the side surface of the cam disc L55 and extends in an arc shape centered on the spindle L44 a of the cam disc L55. and extends approximately one circle in the counterclockwise direction; the driving cam portion L62 is connected to the outer cam portion L61 and extends in an arc shape toward the support shaft L44a; and the inner cam portion L63 is connected to the driving cam portion L62 and extends in an arc shape. It extends in an arc shape with the spindle L44a as the center, and extends approximately around the spindle L44a.

4672 In addition, a predetermined angle portion of the outer cam portion L61 near the drive cam portion L62 (hereinafter referred to as "proximity portion L61a") is formed closer to the support shaft L44a than the other outer cam portions L61.

[0560]

4678 On the other hand, the second cam groove L54 includes an outer cam portion L64 that is provided inward of the outer cam portion L61 of the first cam groove L53 and extends in an arc shape with the support shaft L44a as the center, and Extending from the vicinity of the top end portion of the outer cam portion L61 in a substantially 3/4 arc shape in the counterclockwise direction; a driving cam portion L65 connected to the outer cam portion L64 and extending toward the support shaft L44a; and an inner cam portion L66, which is connected to the drive cam portion L65 and extends in an arc shape with the support shaft L44a as the center.

[0561]

4688 As shown in FIG. 109, the slider L56 extends in the up-down direction, and has a substantially convex shape with a lower portion widened downward.

4690 The upper end of the slider L56 is provided with an engaging convex portion L56a protruding toward the cam disc L55. The engaging convex portion L56a is slidably engaged with the first cam groove L53 of the cam disc L55.

4693 Moreover, two connection shafts L71 and L71 which connect the slider L56 and the filter block L32 are fixed to the lower end part of the slider L56. The two connecting axes L71 and L71 are spaced apart from each other in the front-to-back direction (the left-right direction in Figs. 108 and 109) and parallel to each other in the left-right direction (the front-to-back direction of the figure in Figs. 108 and 109). way to extend. Each connecting shaft L71 passes through the elongated hole L44c extending in the vertical direction of the side wall body L44, and has one end fixed to the slider L56 and the other end fixed to the slider L56 of the left cylinder opening and closing mechanism L51. Therefore, the filter block L32 is supported by the left and

right sliders L56 and L56 via the two connecting shafts L71 and L71. In addition, an elongated hole L56b extending in the up-down direction is formed in the center of the slider L56, and a spindle L44d protruding from a predetermined position in the lower part of the side wall body L44 is slidably penetrated through the elongated hole L56b.

[0562]

4707 The slider L56 configured as above slides in the up and down direction while being guided between a pair of guide rails L44e and L44e extending in the up and down direction in the side wall body L44 as the cam disk L55 rotates.

4710 Along with this, the filter block L32 moves up and down to open and close the lower surface of the cylinder L23. Specifically, the cam disc L55 shown in FIG. 107(a) and FIGS. 108 and 109 rotates clockwise in the two figures, and the engaging convex portion L56a of the slider L56 cams from the outside of the first cam groove L53. The slider L56 rises as the portion L61 slides on the drive cam portion L62 toward the inner cam portion L63.

[0563]

4718 Then, the engagement convex portion L56a of the slider L56 reaches the inner cam portion L63, so that in the drip unit L21 of the paper brewing machine LA, the filter block L32 is in close contact with the lower surface of the cylinder L23 via the filter paper LP. Seal it (see Figure 135).

4721 On the other hand, in the drip unit L21 of the mesh brewing machine LB, the filter block L32 is in direct contact with the lower surface of the cylinder L23 to seal it (see FIGS. 146 and 158). Then, from these states, the cam disc L55 rotates in the counterclockwise direction, the slider L56 descends, and the filter block L32 also descends, thereby opening the lower surface of the cylinder L23 (see Figures 141, 152, and 163)..

[0564]

4728 As shown in Figure 106, Figure 107 and Figure 111, the filter block L32 includes the following components: a circular filter L72, which is used to filter coffee; a wide annular seal L73, which is arranged to surround the filter L72 surrounding; and a block-shaped support member L74, which supports the filter screen L72 and the seal L73 on the upper surface, and has a passage that communicates up and down.

4732 The filter L72 is made of a thin metal plate (for example, a stainless steel plate) that is slightly smaller than the inner diameter of the cylinder L23, and has a large number of pores having a predetermined diameter (for example, 30 μm). The filter block L32 configured in this way moves up and down as the slider L56 slides in the up-down direction. When the lower surface of the cylinder L23 is closed, the upper surface of the seal L73 is in contact with the peripheral edge of the lower surface of the cylinder L23. Seal it. In this case, in the paper brewing machine LA, the filter paper LP is sandwiched between the filter block L32 and the cylinder L23. On the other hand, in the mesh brewing machine LB, the filter block L32 is directly in contact with the cylinder L23.

[0565]

4743 Moreover, the filter block pipe L32a is connected between the support member L74 of the filter block L32 and the joint hose L40 (refer FIG. 107) provided in the back surface lower end part of the right side wall L41.

4745 In addition, in a state where the drip unit L21 is attached to the main body drive unit L22, the joint hose L40 is connected to a joint hose L140 described later on the side of the main body drive unit L22.

[0566]

4750 In addition, as shown in Fig. 107 (a) and Figs. 108 and 109, a waste liquid pipe L50 connected to the above-mentioned joint hose L40 is provided at the lower end of the right side wall L41, and a waste liquid pipe L50 is provided at the lower end portion of the right side wall L41. The waste liquid pipe clamping member L58 opens and closes the pipe L50.

4754 The waste liquid pipe L50 is made of an elastic material such as rubber, has a horizontal portion L50a extending horizontally forward from the joint hose L40, and extends downward from the horizontal portion L50a. In addition, the waste pipe clamping member L58 is formed in a plate shape extending in the up-down direction, and is provided with an engaging convex portion L58a at the upper end that is slidably engaged with the elongated hole L56b of the slider L56. On the other hand, at the lower end, part, a pressing part L58b having a trapezoidal cross section is provided on the lower side of the horizontal part L50a of the waste liquid pipe L50, protruding across the horizontal part L50a. Furthermore, on the upper side of the horizontal portion L50a of the waste liquid pipe L50, a pressing spring L59 for clamping and closing the waste liquid pipe L50 in cooperation with the waste liquid pipe clamping member L58 is provided. This pressure spring L59 is composed of an elongated leaf spring, extends along the horizontal portion L50a of the waste liquid pipe L50, and is arranged to be in contact with the horizontal portion L50a. In addition, both ends of the pressing spring L59 are bent upward and are supported by two support portions L44f provided in the side wall body L44 at the front and rear of the waste pipe clamping member L58 (right and left in FIGS. 108 and 109). , supported by L44f.

[0567]

4771 The waste liquid pipe clamping member L58 configured as described above moves up and down in conjunction with the up and down movement of the slider L56 accompanying the rotation of the cam disk L55.

4774 Specifically, when the slider L56 rises from the state shown in FIGS. 108 and 109, the lower end portion of the elongated hole L56b comes into contact with the engaging convex portion L58a of the waste liquid pipe clamping member L58. Then, when the slider L56 further rises, the waste pipe clamping member L58 is lifted by the engaging convex portion L58a, thereby rising. Thereby, the pressing part L58b of the waste liquid pipe clamping member L58 presses the horizontal part L50a of the waste liquid pipe L50 from below, and thereby the waste liquid pipe L50 is sealed (refer FIG. 135 etc.). In addition, from this state, as the slider L56 descends, the waste liquid pipe clamping member L58 also descends and returns to the original position.

[0568]

4784 In addition, as shown in FIG. 109 , the cylinder head locking member L57 is formed in a predetermined shape extending in the up-and-down direction, and its center portion is rotatably supported by the spindle L44b in the side wall body L44.

4787 The lower end of the cylinder head locking member L57 is provided with an engaging convex portion L57a protruding toward the cam disc L55 side, and the engaging convex portion L57a is slidably engaged with the second cam groove L54 of the cam disc L55. In addition, a hook-shaped locking portion L57b extending rearwardly is provided at the upper end portion of the cylinder head locking member L57.

[0569]

4794 The cylinder head locking member L57 configured in this way rotates as the cam disc L55 rotates, and presses and locks the cylinder head L101 described later to the upper surface of the cylinder L23 through the locking portion L57b at the upper end, thereby locking the upper surface of the cylinder L23. seal.

4797 Specifically, the cam disc L55 shown in FIGS. 109 and 110 rotates clockwise in the two figures, and the engaging convex portion L57a of the cylinder head lock member L57 cams toward the inner cam from the outer cam portion L64 of the second cam groove L54. By sliding the drive cam portion L65 on the drive cam portion L66, the cylinder head lock member L57 rotates around the support shaft L44b in the clockwise direction in FIG. 109 . Then, the locking portion L57b of the cylinder head locking member L57 is engaged with the lid guide rod L113 in the upper part of the cylinder head L101 described later and is locked by pressing it downward. Thereby, the cylinder head L101 seals the cylinder L23 in close contact with the upper surface thereof (see FIG. 138 and the like).

[0570]

4808 The cylinder opening and closing mechanism L51 configured as above is built in the left and right side walls L41 and L41 respectively as mentioned above. The gear portions L55a and L55a of the cam disk L55 of the two cylinder opening and closing mechanisms L51 and L51 are rotatably provided in the The corresponding gears L76 and L76 at predetermined positions in the side wall body L44 are engaged.

4812 As shown in FIG. 107 , two gears L76 and L76 are fixed to both ends of a power transmission shaft L75 extending horizontally in the left-right direction, and each gear L76 is arranged at the center of the rear end in the corresponding side wall body L44 in the up-down direction. department. As shown in FIG. 107(b) , the gear L76 (hereinafter referred to as "driven engagement gear L76a") provided on the left side wall body L44 is slightly exposed rearward, and the drip unit L21 is mounted on the main body drive unit L22. In this state, it meshes with the drive engagement gear L124 described later on the main body drive unit L22 side. Therefore, when the driven engagement gear L76a rotates, the left cam disc L55 meshed with it rotates, and the right cam disc L55 is synchronized with the left cam disc via the power transmission shaft L75 and the right gear L76. The ground rotates.

[0571]

4824 In addition, the left and right side walls L41 and L41 are respectively provided with detachment levers L84 and L84 that are operated when the drip unit L21 is detached from the main body drive unit L22.

4826 As shown in FIGS. 108 and 109, the detachment lever L84 extends in the front-rear direction and is rotatably supported on the support shaft L44d at approximately the center in the longitudinal direction. The operating portion L84a of the front end portion (left end portion in FIGS. 108 and 109) of the detachment lever L84 faces the outside of the side wall L41 and is located inside the recessed portion L41a provided at the front of the side wall L41 and open to the front. In addition, the rear end portion of the detachment lever L84 extends downward by a predetermined length, and a detachment convex portion L84b protruding laterally is provided at the lower end portion. As shown in FIG. 102 etc., this detachment convex part L84b protrudes to the outside via the long hole L45a formed in the predetermined position of the cover L45 of the side wall L41.

[0572]

4838 Here, the attachment and detachment structure of the drip unit L21 with respect to the main body drive unit L22 will be described with reference to FIGS. 102, 112, 113, 114, and 115.

4840 As shown in FIG. 102, FIG. 112, and FIG. 113, two upper and lower engaging convex portions L45 b and L45 b are provided at predetermined positions of the rear end portion on the left and right side surfaces (cover L45) of the drip unit L21. Each engaging convex portion L45b protrudes slightly outward, and its side surface is formed into a U-shape that opens downward. In addition, a total of four support holes L41b open to the rear are formed in the upper and lower end portions of the back surface of the left and right side walls L41 and L41 of the drip unit L21 (see (b) of FIG. 107).

[0573]

4849 On the other hand, two upper and lower hook-shaped locking parts L85 protruding forward are provided at the left and right ends of the front part of the main body driving unit L22 respectively in a manner corresponding to the upper and lower engaging convex parts L45b, L45b of the drip unit L21., L85.

4852 As shown in FIG. 113, these locking portions L85 and L85 are respectively attached to the upper and lower front end portions of a U-shaped connecting member L86 that extends in the vertical direction and has a side shape that opens forward. In addition, the left and right connecting members L86 and L86 are connected at their upper ends by leaf springs L87 and are biased downward. Furthermore, a total of four support protrusions L88 protruding forward are provided at both left and right ends of the main body driving unit L22 at positions corresponding to the four support holes L41b of the drip unit L21 (see FIG. 102).

[0574]

4862 Through the attachment and detachment structure of the drip unit L21 side and the main body drive unit L22 side configured as above, as shown in FIG. 113, in a state where the drip unit L21 is installed on the front side of the main body drive unit L22, each of the main body drive unit L22 The support protrusions L88 are inserted into the support holes L41b of the drip unit L21, and the locking portions L85 of the main body drive unit L22 are engaged with the engaging convex portions L45b of the drip unit L21.

4867 Thereby, the drip unit L21 is firmly mounted on the front side of the main body drive unit L22. On the other

hand, when detaching the drip unit L21 from the main body drive unit L22, as shown in FIG. 115, the front cover L35 of the drip unit L21 is slightly opened, and the operating parts L84a of the left and right detachment levers L84 are simultaneously opened. Press down. Thereby, the detachment convex part L84b of each detachment lever L84 resists the biasing force of the leaf spring L87, and pushes up the lower lock part L85 on the side of the main body drive unit L22. As a result, the upper and lower lock parts L85, L85 are separated from the drip unit L21 The upper and lower engaging convex portions L45b and L45b are disengaged. Then, by pulling the drip unit L21 forward while maintaining this state, the drip unit L21 is detached from the main body drive unit L22.

[0575]

4879 In addition, as shown in (b) of FIG. 107, a cam for preventing the cam disc L55 from rotating when the drip unit L21 is detached from the main body drive unit L22 is provided in the left side wall L41 of the drip unit L21. Locking mechanism L89.

4882 This cam lock mechanism L89 is formed in a predetermined shape and includes a locking member L89a that is slidable in the up-and-down direction below the driven engagement gear L76a, and a spring L89b that urges the locking member L89a upward. When the drip unit L21 is detached from the main body drive unit L22, the lock member L89a engages with the driven engagement gear L76a from below, thereby preventing the driven engagement gear L76a from rotating. Thereby, the cam disc L55 meshed with the driven engagement gear L76a also becomes unable to rotate. On the other hand, when the drip unit L21 is attached to the main body drive unit L22, the lock release convex portion L90 (see FIG. 102) protrudingly provided on the front side of the main body drive unit L22 is engaged with the above-mentioned lock member L89a to press it downward. downward, thereby unlocking the driven engagement gear L76a by the locking member L89a. Thereby, the driven engagement gear L76a becomes rotatable, and the cam disc L55 also becomes rotatable.

[0576]

4896 The following reason is why the cam disk L55 is locked so as not to rotate when the drip unit L21 is detached from the main body drive unit L22 as described above.

4898 That is, as will be described later, the rotation angle of the cam disc L55 is controlled using the mode switch L125 provided in the main body drive unit L22 and having the switch gear L125a that rotates in synchronization with the cam disc L55. Therefore, it is necessary to maintain consistency in the rotation angles of the switch gear L125a and the cam disk L55.

[0577]

4905 Next, the cylinder adapter L34 for holding the cylinder L23 housed in the cylinder frame L24 will be described.

4907 As shown in FIG. 106, the cylinder connector L34 includes a U-shaped support member L91 that opens forward in plan view, and left and right holding members L92 and L92 respectively fixed to the left and right front end portions of the support member L91. The support member L91 is composed of a leaf spring and

includes a base portion L91a extending a predetermined length in the left-right direction and two left and right arm portions L91b and L91b each bent at a right angle at the left and right ends of the base portion L91a and extending a predetermined length forward. The base L91a is threadedly fixed to the inner surface of the back wall L42. Furthermore, gripping members L92 and L92 are fixed to the front end portions of the two arm portions L91b and L91b. The two holding members L92 and L92 face each other, and their facing surfaces are formed in convex shapes.

[0578]

4919 With the cylinder adapter L34 configured in this way, the cylinder L23 accommodated in the cylinder accommodating portion L24a of the cylinder frame L24 is firmly held from the left and right by the left and right holding members L92, L92 by the spring force of the support member L91.

[0579]

4925 As shown in FIGS. 100 to 103, the rack cover L37 covering the upper surface of the cylinder rack L24 is formed to have a substantially rectangular shape in plan view, and is provided with a raw material input port L37a for inputting raw materials into the cylinder L23, and a raw material input port L37a for supplying heat to the cylinder L23. A hot water supply port L37b for water and a hot gas discharge port L37c for discharging steam generated when cooking coffee.

4930 A chute of the grinder K is connected to the raw material input port L37a, a hot water supply pipe is connected to the hot water supply port L37b, and a hose (not shown) for discharging hot gas is connected to the hot gas discharge port L37c.

[0580]

4936 Next, the main body drive unit L22 will be described with reference to FIGS. 116 to 120.

4937 The main body driving unit L22 drives the cam disk L55 of the drip unit L21 and the cylinder head L101 that opens and closes the upper surface of the cylinder L23, supplies air to the cylinder L23, and, in the mesh brewing machine LB, The scraper L102 for discharging the extracted residue is driven.

[0581]

4943 Figures 116 and 117 show the main body driving unit L22 of the paper brewing machine LA and the mesh brewing machine LB respectively.

4945 As shown in the two figures, the main body drive unit L22 includes the following components: a plastic frame L103 (casing, wall part) constituting the front wall of the main body drive unit L22; protruding forward from the upper part of the frame L103 and disposed along the front and rear The cylinder head L101 is freely movable in the direction; the cam drive mechanism L104 drives the cam disk L55; the cylinder head/scraper drive mechanism L105 drives the cylinder head L101 and the scraper L102; and a plurality of clamps L8 described below. a driven clamp driving mechanism L106; and an air pump L107 that supplies air to the cylinder L23.

4952 The above-mentioned cam drive mechanism L104, cylinder head/scraper drive mechanism L105, clamp drive mechanism L106, and air pump L107 are installed on the back side of the frame L103, and are covered by a box-shaped unit cover L108 (casing) whose front and bottom surfaces are open. cover.

[0582]

4958 Fig. 166 shows the air pump L107 and its surroundings when the frame L103 is viewed from the back side.

4959 This air pump L107 is a diaphragm type air pump, that is, the rotation of the motor causes the diaphragm to reciprocate, thereby sucking in air and ejecting the air. As shown in the figure, the air pump L107 has an air suction port L107a and an air ejection port (not shown) spaced apart from each other in the front-rear direction (the front-back direction of the figure) and formed to project in parallel with each other. The air suction port L107a is connected to an air suction space dividing portion L301 formed in a substantially airtight state on the back side of the frame L103 via an air suction pipe L302 (air suction passage). On the other hand, the air ejection port is connected to a first air conveyance pipe L9A and a second air conveyance pipe L9B described later via an air ejection pipe and a branch pipe (neither of which is shown).

[0583]

4970 As shown in FIG. 167, the intake space dividing portion L301 has a rib L303 integrated with the frame L103 and protruding inward of the main body drive unit L22 by a predetermined length.

4972 This rib L303 includes four upper, lower, left and right ribs L303 connected to each other. These ribs L303 define an air intake space L304 inside the rib L303 and form an opening L305 with a rectangular front shape that opens to the inside of the main body drive unit L22. In addition, a more protruding convex portion L303a (contact portion) is provided at the right end portion of the upper rib L303, and a threaded hole L303b is provided in the lower rib L303. Furthermore, a closing plate L311 for closing the opening L305 is attached to the front end of the rib L303.

[0584]

4981 The closing plate L311 is formed by pressing a metal plate or the like, and has a substantially rectangular front shape that is larger than the opening L305 by one circle corresponding to the thickness of each rib L303.

4983 In addition, the left edge portion and the left half portion of the upper edge portion of the closing plate L311 are bent at right angles. Furthermore, in the closing plate L311, a pipe mounting hole L312 (passage connection port) for connecting the end of the air suction pipe L302 on the opposite side to the air suction port L107a is formed in the lower left corner. It is installed in the inserted state, and the threaded insertion hole L314 is formed in the lower edge part, and the screw L313 for screwing the closing plate L311 itself to the rib L303 is inserted into this threaded insertion hole L314. In addition, in the closing plate L311, a minute notch L315 is provided in the right end part of the upper edge part. The notch L315 opens upward and has a V-shaped front surface.

[0585]

4994 The closing plate L311 configured in this way is in contact with the front end portion of the rib L303, and the screw L313 is screwed into the threaded hole L303b of the rib L303 while being inserted into the threaded insertion hole L314. Thereby, the closing plate L311 is installed to close the opening L305. state.

4997 In this case, the bent left edge portion and the upper edge portion of the closing plate L311 are located outside the left and upper ribs L303 respectively. In addition, the upper edge portion of the notch L315 is located from the protrusions of the lower and upper ribs L303. Part L303a is in contact.

[0586]

5003 As described above, the closing plate L311 is attached to the rib L303, thereby forming the air intake space dividing portion L301 that divides the internal air intake space L304.

5005 Therefore, when the air pump L107 operates, the air in the air suction space L304 is sucked into the air suction port L107a via the air suction pipe L302. Then, the sucked air is pressurized and conveyed from the air ejection port to the first air conveyance pipe L9A and the second air conveyance pipe L9B side, and is supplied to the cylinder L23 via these air conveyance pipes.

[0587]

5012 The cylinder head L101 has a circular cover main body L111 whose plan view shape is larger than the upper surface of the cylinder L23, and a slider L112 provided so as to be movable in the front-rear direction in a state penetrating an upper opening L103a provided at the upper part of the frame L103. , the cover main body L111 is supported at the front end portion so as to be able to swing slightly up and down.

5016 The cover body L111 is connected to a first air delivery pipe L9A described later, and an air supply port (not shown) for sending air delivered via the first air delivery pipe L9A downward is provided at a predetermined position on the bottom surface of the cover body L111. . In addition, a cover guide rod L113 that is longer than the outer shape of the cover body L111 and extends in the left-right direction is provided at the upper end portion of the cover body L111. This lid guide rod L113 is slidably engaged with the upper end portions of the left and right side walls L41, L41 of the cylinder frame L24 in the front-rear direction when the drip unit L21 is attached to the main body drive unit L22.

[0588]

5026 Furthermore, a raw material/hot water guide member L114 that guides the raw material from the raw material input port L37a of the rack cover L37 and the hot water from the hot water supply port L37b to the cylinder L23 is attached to the upper front half of the cover body L111.

5029 The raw material/hot water guide member L114 is integrally composed of an auxiliary raw material chute L115 provided in front of the cover body L111 and a hot water guide receiving portion L116 provided on the left side of the auxiliary raw material chute L115. The auxiliary raw material chute L115 is formed in a cylindrical shape extending in the up and down direction. When the cylinder head L101 is in the standby position, the auxiliary raw material chute L115 is located between the raw material input port L37a of the rack cover L37 and the cylinder L23. The input raw materials are further guided to the cylinder L23.

[0589]

5038 On the other hand, the hot water guide and receiving portion L116 is formed in a box shape with an upper surface open, and when the cylinder head L101 is in the standby position, the hot water guide and receiving portion L116 furthers the hot water supplied from the hot water supply port L37b of the rack cover L37. It is guided to the cylinder L23 and drips hot water is received from the hot water supply port L37b, thereby preventing the cylinder head L101 from being wetted by the hot water.

5043 In addition, an auxiliary hot water supply nozzle L116a is provided at the front end portion of the bottom wall of the hot water guide receiving portion L116, penetrating in the up and down direction and protruding slightly downward. When the cylinder head L101 is in the standby position, the auxiliary hot water supply nozzle L116a is disposed at a position facing the hot water guide wall L27 in the cylinder L23 from directly above. Therefore, the hot water flowing from the hot water supply port L37b into the hot water guide receiving portion L116 and sprayed from the auxiliary hot water supply nozzle L116a hits the hot water guide wall L27 in the cylinder L23 from above and is guided by the hot water. The wall L27 is guided along the circumferential direction of the inner surface of the cylinder L23 while flowing downward into the cylinder L23. In addition, the hot water flowing downward along the inner surface of the cylinder L23 is temporarily received by the hot water diffusion convex portion L28 in the cylinder L23, and then flows downward while diffusing in the circumferential direction of the inner surface of the cylinder L23. As described above, hot water is supplied to the cylinder L23.

[0590]

5058 As shown in FIG. 116(a), the main body drive unit L22 of the paper brewing machine LA is equipped with a paper guide extending in the up-down direction in a state of covering the center opening L103b provided in the center of the frame L103 from the front. L109.

5061 This paper guide L109 has a curved portion L109b that covers the lower half of the frame L103 and has a side shape that is convexly curved rearward, and an inclined portion L109a that extends diagonally downward and rearward for a predetermined length from the curved portion L109b.

[0591]

5067 When placing the filter paper LP between the cylinder L23 of the drip unit L21 and the filter block L32, the filter paper LP is manually inserted and fed from below the paper brewing machine LA, so that the front end of the filter paper LP moves along the guide plate The inclined portion L109a of L109 is guided upward, and then is guided forward along the curved portion L109b.

5071 Thereby, the filter paper LP passes between the cylinder L23 and the filter block L32 from the rear side of the drip unit L21 to the front of the drip unit L21. In this way, the filter paper LP can be easily placed using the paper guide L109.

[0592]

5077 In addition, as shown in (a) of FIG. 117, in the main body drive unit L22 of the mesh brewing machine LB,

the scraper L102 is placed at the center opening L103b of the frame L103.

5079 As shown in (b) of FIG. 117, the scraper L102 includes a support L102a whose plan view shape is formed into a rectangular frame shape slightly larger than the plan view shape of the filter block L32, and a rubber scraper body L102b formed from the support member L102a. The front end of the member L102a is attached to the support member L102a so that it hangs down, and the front shape is a horizontally long rectangle. An engaging groove L102c extending in the left-right direction and opening upward is provided at the rear end of the support L102a, and a notch L102d opening rearward is formed at a predetermined position of the engaging groove L102c.

[0593]

5089 The scraper L102 configured in this way can slide in the front-rear direction while being guided by the left and right edges of the center opening L103b of the frame L103.

5091 Furthermore, this scraper L102 is driven by the cylinder head/scraper drive mechanism L105, and the scraper body L102b at the front end part moves on the filter block L32 in the front-rear direction. Thereby, extraction grounds, which are raw materials remaining on the filter L72 after extracting coffee, are scraped off by the scraper body L102b and discharged to the front or rear of the drip unit L21.

[0594]

5098 As shown in FIG. 118, the cam drive mechanism L104 has: a first motor L121 composed of a DC motor; an output gear L123 connected to the first motor L121 via a gear box L122 (refer to FIG. 120); and a drive engagement gear. L124 meshes with the output gear L123 and meshes with the driven engagement gear L76a on the drip unit L21 side in a state where the drip unit L21 is mounted on the main body drive unit L22.

[0595]

5105 A mode switch L125 for controlling the rotation angle of the cam disc L55 is provided near the output gear L123.

5107 The mode switch L125 has a switch gear L125a that meshes with the output gear L123 via an intermediate gear L126 and rotates at an equal angle in synchronization with the cam disc L55.

5109 The mode switch L125 has a plurality of modes that are turned on when the switch gear L125a rotates to a plurality of predetermined rotation angles, and the control unit recognizes the rotation angle of the cam disk L55 based on these modes.

[0596]

5115 The cylinder head/scraper driving mechanism L105 includes the following components: a second motor L131, which is composed of a DC motor; a gear box L132, which is connected to the second motor L131 and has an output extending in the up and down direction and with both ends protruding outward. The shaft (not shown); the cylinder head driving part (not shown) and the scraper driving part L133 are respectively provided at the upper and lower ends of the above-mentioned output shaft.

5120 The cylinder head driving part engages with the rear end portion of the slider L112 of the cylinder head L101 and rotates in accordance with the rotation of the output shaft, thereby connecting the cylinder head L101 to the standby position (the position shown by the solid line in FIG. 118). The cylinder L23 is driven in the front-rear direction between the closed position (the position shown by the two-dot chain line in Fig. 118).

[0597]

5127 On the other hand, the scraper driving part L133 has an arm L133a extending horizontally for a predetermined length and an engaging convex part L133b protruding downward from the front end part thereof.

5130 In the main body driving unit L22 of the mesh brewing machine LB, when the scraper L102 is placed from the front of the frame L103 to the center opening L103b, the engaging convex portion L133b of the scraper driving portion L133 passes through the notch L102d of the rear end portion of the scraper L102. Come and engage with the engaging slot L102c. As the output shaft of the cylinder head/scraper drive mechanism L105 rotates, the scraper drive part L133 rotates, whereby the engaging convex part L133b slides in the engagement groove L102c of the scraper L102. Thereby, the scraper L102 moves along the gap between the standby position (the position shown by the solid line in FIG. 119) and the position of the scraper body L102 b in front of the front end of the filter block L32 (the position shown by the two-dot chain line in FIG. 119). Move forward and backward.

[0598]

5142 In addition, the above-mentioned cylinder head driving part and scraper driving part L133 are both connected to the output shaft via a one-way clutch. When the output shaft rotates in a predetermined direction, only the cylinder head driving part rotates. When the output shaft rotates in the opposite direction to the above-mentioned direction, When rotating in the direction, only the scraper driving part L133 rotates.

[0599]

5150 When extracting coffee, the clamp driving mechanism L106 drives the clamp L8 for opening and closing a plurality of predetermined positions of the conveying pipe L9 for conveying coffee and air.

5152 Here, the arrangement relationship between the delivery pipe L9 and the clamp L8 will be briefly described with reference to FIGS. 98 and 99.

5154 As shown in the two figures, the delivery pipe L9 includes a first air delivery pipe L9A connected between the air pump L107 and the cylinder head L101, and a second air delivery pipe L9A connected between the air pump L107 and the joint hose L140 on the main body drive unit L22 side. Air delivery tube L9B and beverage delivery tube L9C connected to joint hose L140. These delivery pipes L9A to L9C are all made of elastic materials such as rubber. The joint hose L140 is provided at the lower right end of the front side of the main body drive unit L22, and is connected to the joint hose L40 on the drip unit L21 side when the drip unit L21 is mounted on the main body drive unit L22.

[0600]

5164 In addition, the clamp L8 includes three clamps respectively installed in the middle of the delivery pipes L9A to L9C, specifically the first air clamp L8A, the second air clamp L8B, and the beverage clamp L8C. .

5166 These clamping parts L8A to L8C are the same. As shown in FIG. 120 , each clamp L8 includes a pipe holder L141 that holds the portion of the delivery pipe L9 to which it is attached, and a clamp body L142 that is rotatably attached to the pipe holder L141 . for cooperating with it to squeeze and seal the delivery pipe L9; and a cam L143, which is rotatably provided on the side of the clamp body L142 opposite to the delivery pipe L9, for pressing the clamp body L142 to The L9 side of the delivery pipe.

[0601]

5174 In the clamps L8A to L8C configured in this way, the first air clamp L8A and the second air clamp L8B are arranged adjacent to each other on the left and right, and the beverage clamp L8C is arranged in front of the first air clamp L8A. Opposite to the first air clamp L8A.

5177 In addition, the cam L143 is shared among these clamps L8A to L8C.

[0602]

5181 The clamp driving mechanism L106 includes a first motor L121 and a gear box L122 that are common to the aforementioned cam driving mechanism L104, an output gear L144 fixed to the right end of the output shaft, and an output gear L144 that meshes with and is fixed to the clamp. The drive gear L146 of the cam L143 of the component L8, the rotation axis L145, and so on.

[0603]

5188 As mentioned above, the cam driving mechanism L104 and the clamp driving mechanism L106 use the first electric motor L121 as a common driving source to drive the following components to cooperate with each other: the cam disk L55 driven by the cam driving mechanism L104, the filter block L32 , cylinder head locking member L57 and waste liquid pipe clamping member L58; and three clamping parts L8A ~ L8C driven by the clamping part driving mechanism L106.

5193 Therefore, when extracting coffee, the opening and closing of the upper surface and the lower surface of the cylinder L23, the opening and closing of the waste liquid pipe L50 by the waste liquid pipe clamping member L58, and the transport of the clamping members L8A to L8C can be performed efficiently and appropriately. Controls the opening and closing of L9A~L9C.

[0604]

5200 Next, the filter paper feeding device L201 of the paper brewing machine LA will be described with reference to FIGS. 121 to 128 .

5202 The filter paper discharging device L201 includes a paper holder unit L202 that holds the filter paper LP and a paper driving unit L203 that drives the paper holder unit L202.

5204 The paper holder unit L202 is slidably and detachably mounted on the bottom of the drip unit L21 in the front and rear direction. On the other hand, the paper drive unit L203 is slidably and detachably mounted on the bottom of the main drive unit L22 in the front and rear direction. Left end.

[0605]

5210 As shown in FIGS. 122, 123 and 124, the paper holder unit L202 is provided with the following components: a strip-shaped continuous filter paper LP wider than the outer diameter of the cylinder L23 of the drip unit L21; and the filter paper LP can be fed out. The held rack body L204; the two left and right feed rollers L205 and L205 provided on the upper front side of the rack body L204; and the paper release door installed on the front end of the rack body L204 so as to cover the two feed rollers L205 and L205. L206; a paper end detection lever L207 provided on the back side of the rack body L204; and a roller driving mechanism L208 built into the left side wall of the rack body L204 for rotationally driving the paper feed rollers L205 and L205.

[0606]

5221 Filter paper LP is the same as the general filter paper used for coffee extraction. It is made of extremely fine weaving of plant fibers, etc., and has a higher degree of filtration than the aforementioned filter L72.

5223 In addition, the filter paper LP has a roll portion LPr that is wound in a roll shape around a cylindrical core portion LPs having a predetermined inner diameter.

[0607]

5228 The rack main body L204 is formed in a box shape with the lower surface and the lower half of the front surface open, and is provided with a plastic frame L211 that accommodates the paper roll part LPr of the filter paper LP inside.

5231 As shown in (b) of FIG. 123, the central portion of the frame L211 is formed in an upward convex arc shape from the back side to the front side, and the lower half of the front side of the frame L211 is covered by a film cover L212. L212 is installed on the top surface of the frame L211 and extends to the lower end of the front surface.

5235 In addition, the frame L211 has left and right side walls L213, L213, and a cover L215 is attached to the outside of the left side wall L213. On both side walls L213 and L213, a circular opening L213a having a predetermined diameter is formed at a left-right symmetrical position substantially in the center. Furthermore, a paper roll support member L216 is attached to the outside of each side wall L213 via the opening L213a. The paper roll support member L216 is configured to be freely removable with respect to the inside of the frame L211 and supports the paper roll LPr of the filter paper LP.

[0608]

5244 The paper roll support member L216 is made of a plastic molded product. As shown in FIG. 124, it includes a circular convex portion L216a whose side shape is one circle smaller than the opening L213a and a flexible

portion extending downward from the convex portion L216a. The legs of L216b.

5247 The convex portion L216a is disposed so as to slightly protrude inward of the frame L211 from the opening L213a of the side wall L213. An inclined surface L216c is formed in the lower half of the convex portion L216a and is inclined downward toward the side wall L213. The paper roll portion LPr of the filter paper LP is rotatably supported by the left and right paper roll portion support members L216 configured as above in a state in which the convex portion L216a is inserted into the core portion LPs.

[0609]

5255 In addition, the filter paper LP can be easily attached and detached from the paper holder unit L202 as follows.

5257 That is, when the paper roll portion LPr of the filter paper LP is inserted into the rack body L204 from below, the left and right end surfaces of the paper roll portion LPr come into contact with the inclined surfaces L216c of the convex portions L216a of the left and right paper roll portion supporting members L216, Each convex part L216a is pressed to the side wall L213 side, so that each convex part L216a which originally protruded inward retreats toward the side wall L213 side. That is, the two convex portions L216a, L216a expand to the left and right (the state shown by the two-dot chain line in FIG. 124(b)). Then, when the core portion LPs of the paper roll portion LPr reaches the position of the convex portion L216a, the two convex portions L216a return to the inside and engage with the core portion LPs. In this way, the filter paper LP can be easily installed simply by inserting the paper roll portion LPr into the rack body L204 from below.

[0610]

5269 On the other hand, when the paper roll part LPr of the filter paper LP is to be removed from the paper holder unit L202, such as when replacing the filter paper LP, the paper roll part LPr is temporarily pushed up in the rack body L204.

5272 In this case, the edge portion of the lower half of the core portion LPs of the paper roll portion LPr comes into contact with the inclined surface L216c of the left and right paper roll portion support members L216, so that the left and right sides of the paper roll portion LPr are installed similarly to the above-mentioned installation of the filter paper LP. The convex portions L216a and L216a of the paper roll support member L216 expand left and right. Then, from this state, the paper roll portion LPr is pulled out diagonally downward and forward. Thereby, the paper roll part LPr is taken out to the front via the lower half of the front surface of the rack main body L204. As described above, the filter paper LP can also be easily removed through the above-mentioned process.

[0611]

5283 In addition, each paper roll support member L216 is firmly attached to the side wall L213 of the frame L211 through a predetermined fall-off prevention member L217 at its leg portion L216b.

5285 Therefore, even if the convex portion L216a is pressed by the paper roll portion LPr during the above-mentioned installation and removal of the filter paper LP, the paper roll portion support member L216 will not be separated from the side wall L213 of the frame L211.

[0612]

5291 As shown in Figures 122 and 123, the left and right paper feed rollers L205 and L205 have the same shape and size. The left and right side walls L213 and L213 of the span body L204 extend in the left and right direction and are spaced apart from each other in the left and right direction. It is fixed to the drum shaft L218 which is rotatably supported by the two side walls L213, L213 at intervals.

5295 The paper feed roller L205 is formed into a predetermined shape by an arc portion L205a, a straight line portion L205b, and a small arc portion L205c. The arc portion L205a has a predetermined thickness and diameter, and the straight line portion L205b is in a straight line with the circular arc portion. Both ends of the arc portion L205a are connected. The small arc portion L205c is protrudingly provided on the inner edge of the linear portion L205b and has a smaller diameter than the diameter of the arc portion L205a. A large number of teeth are formed in the arcuate portion L205a along the circumferential direction.

[0613]

5304 The paper release door L206 includes a door main body L221 extending in the left-right direction and left and right arms L222 and L222 extending at right angles from both ends of the door main body L221 and having a side shape bent at approximately 90 degrees.

5307 A roller shaft L223 extending in the left-right direction is fixed to the back surface of the door body L221, and rollers L224 and L224 respectively corresponding to the two feed rollers L205 and L205 are rotatably supported at both ends thereof. In addition, a slag separation plate L225 for separating the extraction slag from the filter paper LP when the extraction slag is discharged using the filter paper LP is attached to the front surface of the door body L221. When the paper holder unit L202 is attached to the drip unit L21, the slag separation plate L225 extends from the door main body L221 to the vicinity of the guide roller L38 on the front side of the drip unit L21 so as to be inclined rearward and upward.

[0614]

5317 The left and right arms L222, L222 are rotatably supported in a state in which the engaging convex portion L222a protrudingly provided on the outer surface of the front end portion is inserted into the front end portion of the left and right side walls L213 of the rack body L204 from the inside. Longitudinal engagement hole L213b.

5321 In addition, a spring L226 that urges the paper release door L206 toward the rack body L204 is installed between the substantially central portion of each arm L222 in the longitudinal direction and the corresponding side wall L213. Moreover, a locking portion L222b is provided at a predetermined position of each arm L222 close to the door body L221. The locking portion L222b protrudes outward and is used for locking with the locking portion L213c provided at the upper portion of the front end of the corresponding side wall L213. Lock the paper release door L206 in a closed state.

[0615]

5330 The filter paper LP is guided by the guide roller L204a at the lower end of the back surface of the frame body L204 and the guide roller L39 on the rear side of the drip unit L21, passes between the cylinder L23 and the filter block L32, and is then guided by the guide roller L38 on the front side of the drip unit L21. is guided and placed in a manner to hang down on the front side of the drip unit L21.

5334 Furthermore, the hanging portion of the filter paper LP is sandwiched between the left and right paper feed rollers L205 and L205 configured as described above and the two rollers L224 and L224 of the paper release door L206. The paper feed rollers L205 and L205 are rotationally driven in a predetermined direction (clockwise direction in FIG. 123(b)) by the roller driving mechanism L208, thereby feeding the paper from the paper roll portion LPr side in the frame body L204 as described above. Place the filter paper LP.

[0616]

5342 In addition, as shown in FIG. 122 (b) and FIG. 123 (b), in the two paper feed rollers L205 and L205, when waiting for feeding the filter paper LP, each linear portion L205b and the corresponding roller L224, L224 Facing each other.

5345 In this case, the filter paper LP is not sandwiched between the paper feed roller L205 and the roller L224. Therefore, when performing maintenance on the paper brewing machine LA, etc., the filter paper LP can be easily pulled out manually under the paper feed roller L205 and the roller L224. In addition, even if the filter paper LP is pulled to the filter block L32 side as the filter block L32 rises when extracting coffee, since the filter paper LP is not sandwiched between the paper feed roller L205 and the roller L224, it is possible to avoid damage to the filter paper LP. Undesirable condition.

[0617]

5354 In addition, when the filter paper LP is placed between the paper feed roller L205 and the roller L224, as shown in FIG. 123(b) , the paper release door L206 is opened by rotating the paper release door L206 to the front side. This can ensure a relatively large space between the paper feed roller L205 and the roller L224.

5357 Then, after the filter paper LP passes through the space, the paper release door L206 is closed in its original state. In this way, the above-described placement of the filter paper LP can be easily performed by opening and closing the paper placement door L206.

[0618]

5363 As shown in FIG. 123B and FIG. 125 , the paper end detection lever L207 is rotatably supported on the rear lower end of the frame L211 of the frame body L204 around a spindle L207 a extending horizontally in the left-right direction.

5366 In addition, the paper end detection lever L207 has a long lever body L207b extending upward from the right end of the support shaft L207a (the upper end of FIG. 125(a)), and a detection lever part L207c that extends from the support shaft L207a. The left end portion of L207a (lower end portion in FIG. 125(a)) extends slightly diagonally downward and rearward. The lever body L207b is located inside the frame L211, and the detection lever part L207c protrudes toward the rear of the frame L211. In addition, a torsion spring L228 is attached to the left end of the support shaft L207a of the paper end detection lever L207. This torsion spring

L228 biases the paper end detection lever L207 in the clockwise direction in FIG. 123(b). Therefore, as shown in this figure, in the paper end detection lever L207, the lever body L207b is in contact with the outer peripheral surface of the paper roll portion LPr of the filter paper LP, and as shown in (b) of Figure 125, the paper end detection lever L207 is in contact with the outer peripheral surface of the paper roll portion LPr of the filter paper LP. The paper end detection lever L207 follows the reduction in the diameter of the paper roll portion LPr and rotates clockwise. Along with this, the detection lever part L207c rotates upward, and this is detected by the paper end detection switch L247 on the side of the paper drive unit L203, which will be described later.

[0619]

5383 Next, the roller driving mechanism L208 for rotationally driving the left and right paper feed rollers L205 and L205 will be described.

5385 As shown in FIG. 124, the drum driving mechanism L208 is provided in a space surrounded by the left side wall of the rack body L204, that is, the left side wall L213 of the frame L211, and the cover L215. This drum drive mechanism L208 includes a front pulley L231 fixed to the end of the drum shaft L218 protruding from the left side wall L213, and a rear pulley L232 rotatably provided behind the left side wall L213. end; the synchronous belt L233, which is wound around the two pulleys L231 and L232; and the driven gear L235, which is fixed to the support shaft L234 shared with the rear pulley L232, and is arranged between the rear pulley L232 and the left side between walls L213. The driven gear L235 is rotationally driven in a predetermined direction (clockwise direction in FIG. 124(a)) by a driving gear L244 of the paper driving unit L203 to be described later, so that the rear pulley L232 rotates in the same direction. Therefore, by The synchronous belt L233 and the front pulley L231 also rotate in the same direction. Thereby, the left and right paper feed rollers L205 and L205 rotate as mentioned above, and feed the filter paper LP.

[0620]

5399 In addition, a gear locking mechanism L236 is provided near the driven gear L235 of the frame L211. When the paper holder unit L202 is detached from the drip unit L21 and separated from the paper driving unit L203, the gear locking mechanism L236 locks the driven gear. L235.

5402 As shown in FIG. 126, this gear lock mechanism L236 includes a locking member L237 and a spring L238 that urges the locking member L237 rearward (to the left in FIG. 126). The locking member L237 has a ring portion L237a formed in a horizontally long annular shape surrounding a hub portion L235a formed integrally with the side surface of the driven gear L235, and a sliding portion L237b extending forward from the ring portion L237a. The side wall L213 on the left side of the frame L211 is supported slidably in the front-rear direction. In addition, a lock convex portion L239 protruding rearward is provided at the front end portion inside the ring portion L237a.

[0621]

5412 On the other hand, an engaging recessed portion L235b opening to the outside is formed at a predetermined position on the peripheral surface of the hub portion L235a of the driven gear L235.

5414 When the driven gear L235 is in the standby position, as shown in FIG. 126 , the engaging recessed portion L235b faces the locking convex portion L239 of the locking member L237.

[0622]

5419 In the gear lock mechanism L236 configured as described above, when the paper holder unit L202 and the paper drive unit L203 are in a state of being separated from each other, as shown in FIG. The portion L239 is fitted into the engaging recessed portion L235b of the driven gear L235.

5422 Thereby, the driven gear L235 is locked. On the other hand, in a state where the paper holder unit L202 and the paper drive unit L203 are connected to each other, the lock member contact portion L241a of the front end portion of the paper drive unit L203 comes into contact with the ring portion L237a of the lock member L237 from behind, resisting the spring L238 Apply force to press the locking member L237 forward. Thereby, the lock convex part L239 of the lock member L237 is disengaged from the engagement recessed part L235b of the driven gear L235, and as a result, the driven gear L235 becomes a rotatable state.

[0623]

5431 In this way, when the paper holder unit L202 is detached from the paper drive unit L203, the driven gear L235 is locked. Therefore, in addition to the rear pulley L232 integrated with it, the front pulley L231 connected to it via the timing belt L233 is also locked. Locked.

5434 As a result, the two feed rollers L205 and L205 fixed to the roller shaft L218 which is the common rotation shaft with the front pulley L231 are also locked. Thereby, with the paper holder unit L202 detached from the paper drive unit L203, the paper feed roller L205 can be locked such that the linear portion L205b of each paper feed roller L205 faces the corresponding roller L224.

[0624]

5441 As mentioned above, it is preferable that during standby, the feed roller L205 stops so that the straight portion L205b faces the roller L224.

5443 Therefore, during maintenance, etc., before the paper holder unit L202 is detached from the paper drive unit L203 and reattached to the paper drive unit L203, the stop angular position of the paper feed roller L205 can be maintained, so paper feed during standby can be ensured. The above-mentioned stop angular position of drum L205. In addition, the lock of the paper feed roller L205 can be easily unlocked simply by attaching the paper holder unit L202 to the paper drive unit L203.

[0625]

5451 FIG. 127 shows the paper drive unit L203, and FIG. 128 shows the internal structure of the paper drive unit L203 and shows the paper holder unit L202.

5453 As shown in the two figures, the paper drive unit L203 is equipped with: a motor L242, which is arranged at the rear part of the housing L241 that constitutes the outer shell of the paper drive unit L203; and a gear box L243, which is connected to the motor L242 and installed in the housing L241. and the drive gear L244,

which is arranged in the front part of the housing L241 and is fixed to the output shaft L243a extending in the left-right direction of the gear box L243 (the front-back direction in Figure 128). A cam L245 having an engaging recess L245a at a predetermined position is provided on the left side of the drive gear L244. In addition, a paper feed detection switch L246 is disposed behind the drive gear L244. The paper feed detection switch L246 is composed of a micro switch that performs on/off switching using a cam L245. The paper feed detection switch L246 has a switch roller L246b at the front end of the operation lever L246a. When the switch roller L246b is pressed against the peripheral surface of the cam L245 of the drive gear L244, the paper feed detection switch L246 is turned on, and the paper feed detection switch L246 is turned on. The roller L246b faces the engagement recessed portion L245a of the cam L245 and is released from pressing, and the paper feed detection switch L246 is turned off.

[0626]

5469 In addition, in the paper drive unit L203, a paper end detection switch L247 composed of a micro switch is provided at the lower end of the housing L241, and an on/off switch of the paper end detection switch L247 is arranged on the lower side. Switching lever L248.

5472 The paper end detection switch L247 has a switch roller L247b at the top end of the operating lever L247a. By pressing the switch roller L247b from below with the switching lever L248, the paper end detection switch L247 is turned on, and is released by this pressing. The exhaustion detection switch L247 is in an off state.

[0627]

5478 As shown in (a) of FIG. 128, the switching lever L248 extends in the front-rear direction, and switches the paper end detection switch L247 to the ON state centered on the fulcrum L248a at the rear end (the left end in the figure). The paper end detection switch L247 is rotatably supported between the position (the position shown in FIG. 128(a)) and the off switching position (the position shown in FIG. 128(b)) in which the paper end detection switch L247 is switched to the off state. Housing L241.

5483 In addition, the front end portion of the switching lever L248 is provided with a bifurcated engaging portion L248b extending obliquely upward and obliquely downward. Furthermore, a torsion spring L249 is provided at the fulcrum L248a of the switching lever L248, and the torsion spring L249 biases the switching lever L248 in the counterclockwise direction in FIG. 128.

[0628]

5490 Therefore, as shown in (a) of FIG. 128, in a state where the paper holder unit L202 and the paper drive unit L203 are separated, the paper end detection switch L247 is pressed from below by the switching lever L248 and is turned on.

5493 On the other hand, as shown in (b) of FIG. 128, when the paper rack unit L202 is mounted on the paper drive unit L203, the detection lever portion L207 c of the paper end detection lever L207 on the paper rack unit L202 side is in contact with the paper drive unit. The engaging portion L248b at the front end of the switching lever L248 on the L203 side is engaged.

[0629]

5500 As shown in (b) of FIG. 123, when the remaining amount of filter paper LP is sufficient, the detection lever portion L207 c at the lower end of the paper end detection lever L207 is located at a position extending obliquely downward toward the rear.

5503 In this case, as shown in (b) of FIG. 128, the detection lever portion L207c is engaged with the engagement portion L248b of the switching lever L248 of the paper drive unit L203 to press it downward. Thereby, the switching lever L248 is located at the off switching position. As a result, the paper end detection switch L247 is in the off state, so the control unit determines that the paper is not empty.

[0630]

5510 On the other hand, when the filter paper LP is used to extract coffee and the diameter of the paper roll portion LPr of the filter paper LP decreases and reaches a predetermined diameter as shown by the two-dot chain line in FIG. 125(b), the paper is used. The detection lever part L207c of the lower end part of the detection lever L207 is located in the position which extends substantially horizontally.

5514 Thereby, the pressing force of the detection lever part L207c on the switching lever L248 on the paper drive unit L203 side is released. As a result, the switching lever L248 is positioned at the on switching position due to the biasing force of the torsion spring L249. As a result, the paper end detection switch L247 is in the on state, so the control unit determines that the paper is out.

[0631]

5521 In addition, the above-mentioned paper end detection lever L207 is used not only for determining the end of paper, but also for determining whether the paper holder unit L202 is properly installed on the paper drive unit L203.

5524 That is, when the paper holder unit L202 is detached from the paper drive unit L203, as shown in (a) of FIG. 128, the switching lever L248 of the paper drive unit L203 is in the on switching position, and the paper end detection switch L247 is on. state. When the paper holder unit L202 is properly attached to the paper drive unit L203 from this state, as shown in (b) of FIG. 128, the detection lever portion L207c of the paper end detection lever L207 and the switching lever L248 on the paper drive unit L203 side The engaging part L248b is engaged to press it downward. Thereby, the switching lever L248 is located at the off switching position. As a result, the paper end detection switch L247 changes from the on state to the off state. Therefore, the control unit determines that the paper holder unit L202 is properly installed.

[0632]

5535 On the other hand, when the paper holder unit L202 is not properly installed on the paper drive unit L203, the detection lever portion L207c of the paper end detection lever L207 does not properly engage with the switching lever L248 on the paper drive unit L203 side, so that The switching lever L248 is maintained in the on switching position, and as a result, the paper end detection switch L247 is maintained in the on state.

5539 That is, when the paper holder unit L202 is installed on the paper drive unit L203, the paper end detection

switch L247 should be turned off, but the paper end detection switch L247 remains on, and it can be determined that the paper end detection switch L247 is turned off. Paper holder unit L202 is not installed properly. As described above, the paper end detection lever L207 can be used to easily determine whether the paper holder unit L202 is properly attached to the paper drive unit L203.

[0633]

5547 Next, the operation of the brewing mechanism L configured as above will be described with reference to the flowcharts of FIGS. 129 to 133 and the operation diagrams of FIGS. 134 to 164.

5549 In addition, in the operation diagram, the upper layer is shown centered on the rotational movement of the cam disc L55, and the lower layer is shown centered on the movements of the filter block L32 and the cylinder head L101. In addition, in the following description, the coffee cooking operation using the paper brewing machine LA will first be described with reference to the operation diagrams of FIGS. 134 and 144, and then the coffee cooking operation using the mesh brewing machine LB will be described.

[0634]

5557 FIG. 129 shows the execution processing (main routine) of the sales operation when there is a sales instruction in the cup-type vending machine 1 equipped with the paper brewing machine LA or the mesh brewing machine LB. The sales instruction is based on the use of the user. Operations performed by the coffee product selection button.

5561 This control program corresponds to both the paper brewing machine LA and the mesh brewing machine LB, and is common to the two brewing machines LA and LB.

[0635]

5566 In addition, FIG. 134 shows the standby state of the paper brewing machine LA.

5567 In this standby state, the cam disk L55, the filter block L32, and the cylinder head L101 are in their respective standby positions, and both the upper surface and the lower surface of the cylinder L23 are open. In addition, in this standby state, as shown in (1) of FIG. 165, the first air clamp L8A, the second air clamp L8B, and the beverage clamp L8C are all in the open state. Therefore, they are in an open state with the clamps. The conveying pipes L9A to L9C corresponding to L8A to L8C are all open.

[0636]

5575 In the main routine of the sales operation shown in FIG. 129, first in step LS1 (shown as "LS1" in the figure).

5576 Same as below), the initial processing (subroutine) for extracting residue discharge is executed. Fig. 130 shows the initial processing for extraction residue discharge. As shown in this figure, in this subroutine, it is first determined whether the filter paper LP exists (step LS21). Specifically, the determination is made based on whether the paper drive unit L203 is mounted on the brewing machine body L20 and the motor L242 of the paper drive unit L203 is electrically connected to the control unit. Since the paper brewing machine LA is equipped with the paper driving unit L203, the determination result of the above-mentioned step LS21 is

"Yes", and this subroutine is ended directly.

[0637]

5586 Returning to the main routine of Fig. 129, in step LS2, the filter block L32 is raised.

5587 Specifically, in the main body driving unit L22, the first motor L121 of the cam driving mechanism L104 rotates in a predetermined direction, thereby causing the cam disc L55 of the drip unit L21 to rotate clockwise in FIG. 134. Thereby, the slider L56 engaged with the first cam groove L53 of the cam disc L55 rises, and the filter block L32 supported by the slider L56 rises together with the filter paper LP on its upper side. In this case, while the slider L56 is rising, the lower edge portion of the elongated hole L56b of the slider L56 comes into contact with the engaging convex portion L58a of the waste pipe clamping member L58, and then, as the slider L56 rises, , the waste liquid pipe clamping member L58 also rises. Then, as shown in FIG. 135, the cam disc L55 rotates approximately 180 degrees from the standby position, whereby the filter block L32 seals the lower surface of the cylinder L23 with the filter paper LP pressed against the lower surface of the cylinder L23. In addition, in this case, the waste liquid pipe clamping member L58 presses the waste liquid pipe L50 between its pressing portion L58b and the pressing spring L59, thereby closing the waste liquid pipe L50.

[0638]

5602 Next, in this state, a predetermined amount of raw material (for example, 10 g) and hot water (for example, 105 ml) are supplied from the tank D10 and the hot water tank F into the cylinder L23 (step LS3).

5604 Specifically, the raw material is supplied to the cylinder L23 via the raw material input port L37a of the frame cover L37 and the auxiliary raw material chute L115 of the cylinder head L101. In addition, when the user operates the coffee increment button to perform large-capacity extraction described below, a larger amount of raw material (for example, 15 g) than the above is supplied to the cylinder L23. On the other hand, hot water is supplied to the cylinder L23 via the hot water supply port L37b of the rack cover L37 and the auxiliary hot water supply nozzle L116a of the cylinder head L101. In addition, in this raw material/hot water supply state, as shown in (2) of FIG. 165, only the second air clamp L8B is in the open state, and the other clamps L8A and L8C are in the closed state.

[0639]

5615 In addition, after the raw materials and hot water are supplied, the above-mentioned state is maintained, and the air pump L107 is operated for a predetermined time to supply stirring air to the cylinder L23 (step LS4).

5617 Specifically, air is sent from the air pump L107 to the filter block L32 via the second air delivery pipe L9B and the filter block pipe L32a. Thereby, the air passes through the filter screen L72 of the filter block L32 and the filter paper LP, and stirs the raw materials and hot water in the tank L23.

[0640]

5623 After the above-mentioned stirring is completed, as shown in FIG. 136, a predetermined amount of hot

water (for example, 50 ml) is supplied from the hot water tank F into the cylinder L23 as post-hot water (step LS5).

5626 By supplying the post-hot water in this way, even if the raw material adheres to the upper portion of the inner surface of the cylinder L23 when supplying the raw material, the post-hot water can be used to separate the raw material from the inner surface of the cylinder L23. As a result, all the raw materials supplied to the tank L23 can be effectively used for cooking coffee, and the raw materials adhering to the tank L23 can be prevented from being used at the next sale, so that high-quality coffee can be cooked at the next sale.

[0641]

5634 Next, in the main body driving unit L22, the second motor L131 of the cylinder head/scraper driving mechanism L105 rotates in a predetermined direction, so that the cylinder head driving part rotates a predetermined angle (for example, 180 degrees), so that the cylinder head L101 in the standby position Go forward (step LS6).

5638 Specifically, as shown in FIG. 137, the cover body L111 of the cylinder head L101 reaches directly above the cylinder L23. Then, while maintaining this state, the air pump L107 is operated again for a predetermined time, thereby supplying stirring air to the cylinder L23 in the same manner as the above-mentioned stirring (step LS7). Through the above, coffee is extracted inside the tank L23.

[0642]

5645 Next, the first motor L121 of the cam drive mechanism L104 rotates again, whereby the cam disc L55 further rotates.

5647 Then, as shown in FIG. 138, the cam disk L55 rotates about 240 degrees from the standby position, and thereby the cylinder head locking member L57 engaged with the second cam groove L54 of the cam disk L55 rotates clockwise in the figure. A little, the cover guide rod L113 is pressed downward by its locking portion L57b, and the cylinder head L101 is locked (step LS8). Thereby, the cylinder head L101 seals the cover main body L111 and the upper surface of the cylinder L23 in the state which abutted. In addition, in this state, as shown in (3) of FIG. 165, the first air clamp L8A and the beverage clamp L8C are in the open state, while the second air clamp L8B is in the closed state.

[0643]

5657 Then, in step LS9, coffee extraction processing (subroutine) is executed.

5658 Figure 131 shows the coffee extraction process. As shown in this figure, in this subroutine, it is first determined whether or not the filter paper LP exists (step LS31) in the same manner as the aforementioned step LS21. In the paper brewing machine LA, the determination result in step LS31 is "YES", and in the next step LS32, it is determined whether to perform large-capacity extraction. This large-capacity extraction is an extraction process of coffee executed when the user operates the coffee increment button.

[0644]

5666 When the coffee increment button is not operated (step LS32: No), the process proceeds to step LS33, and the air pump L107 is operated for a predetermined time to supply air for delivery to the cylinder L23 (step LS33).

5669 Specifically, air is sent from the air pump L107 to the cylinder head L101 via the first air delivery pipe L9A, and is supplied to the cylinder L23. The inside of the cylinder L23 is pressurized by the air, and the coffee extracted inside is filtered by the filter paper LP and the filter screen L72. After passing through the filter block L32, the filter block pipe L32a, the beverage delivery pipe L9C, the mixing bowl M and the beverage pipe L16, it is Supplied to the cup W placed at the cooking position.

[0645]

5677 On the other hand, when the coffee increment button is operated (step LS32: "Yes"), the process proceeds to step LS34, and the large-capacity extraction process (subroutine) is executed (step LS34).

5679 Figure 132 illustrates bulk extraction processing. As shown in this figure, in this subroutine, first, the air for transport is supplied to the cylinder L23 (first time) (step LS41) in the same manner as step LS33 in FIG. 131 described above. Thereby, the coffee extracted in the cylinder L23 is supplied to the cup W as the coffee obtained by the first extraction. However, in this case, it is preferable to stop the air pump L107 before the coffee in the cylinder L23 is completely transported out, and use the residual pressure of the air supplied to the cylinder L23 to transport the coffee. This can reduce the possibility that the fine powder of the raw material is transported out together with the coffee and is supplied to the cup W. Therefore, it is possible to supply the cup W with high-quality coffee without any foreign taste.

[0646]

5690 Next, the first motor L121 of the cam drive mechanism L104 rotates in the opposite direction to the above-mentioned direction, whereby the cam disc L55 also rotates in the opposite direction by a predetermined angle (approximately 60 degrees, approximately 180 degrees when viewed from the standby position).

5693 In this case, as shown in FIG. 139, the lock of the head guide rod L113 by the cylinder head locking member L57 is unlocked, thereby unlocking the cylinder head L101 (step LS42). In addition, in this case, the cover guide rod L113 is pushed up by the convex portion L55b of the cam disc L55.

[0647]

5699 Next, the second motor L131 of the cylinder head/scraper driving mechanism L105 rotates in the same direction as described above, so that the cylinder head driving part further rotates a predetermined angle (for example, 180 degrees), so that the cylinder head L101 retreats as shown in FIG. 143, returns to the standby position (step LS43).

5703 Thereby, the upper surface of the cylinder L23 is opened. Then, a predetermined amount of hot water (for example, 140 ml) is supplied from the hot water tank F into the cylinder L23 as additional hot water (step LS44).

[0648]

5709 In addition, after the additional hot water is supplied, similarly to step LS4, stirring air is supplied to the cylinder L23 (step LS45), and the existing raw materials and the additional hot water in the cylinder L23 are stirred.

5712 After the stirring is completed, similarly to steps LS6 and LS8, the cylinder head L101 in the standby position is advanced to directly above the cylinder L23 (step LS46), and the cylinder head L101 is locked (step LS47). Thereby, as shown in FIG. 144, the upper surface of the cylinder L23 is sealed by the cylinder head L101. Then, similarly to step LS33 in FIG. 131, air for transport is supplied to the cylinder L23 (second time) (step LS48). Thereby, the coffee extracted in the cylinder L23 is supplied to the cup W as the coffee obtained by the 2nd extraction.

[0649]

5721 Returning to the main routine of Fig. 129, after the coffee extraction process in step LS9 described above is completed, the lock of the cylinder head L101 is released (step LS10) in the same manner as in step LS42 in Fig. 132, and thereafter, in the same manner as in step LS43, the cylinder head L101 is unlocked. The cover L101 retreats and returns to the standby position (step LS11).

[0650]

5728 Next, while maintaining the above state, as shown in FIG. 140, a predetermined amount of hot water (for example, 8 ml) is poured from the hot water tank F into the cylinder L23 as flushing hot water for cleaning the inner surface of the cylinder L23 (first time) (Step LS12).

5731 As described above, based on the internal shape of the cylinder L23 and the positional relationship of the auxiliary hot water supply nozzle L116a of the cylinder head L101 in the standby position, the flushing hot water injected into the cylinder L23 via the auxiliary hot water supply nozzle L116a flows along the cylinder. The inner surface of L23 flows down while spreading along the circumferential direction.

5735 Accordingly, after the coffee is transported out of the tank L23, the extraction grounds adhering to the inner surface of the tank L23 flow downward together with the flushing hot water.

[0651]

5740 Thereafter, the first motor L121 of the cam drive mechanism L104 rotates in the same direction as described above, thereby causing the cam disk L55 to rotate a predetermined angle (approximately 180 degrees), thereby causing the filter block L32 to descend as shown in FIG. 141 (step LS13) to return to the standby position.

5744 In this case, the extraction residue LG remains on the filter paper LP on the filter block L32. Then, while maintaining this state, as shown in the figure, a predetermined amount of hot water (for example, 10 ml) is further poured into the cylinder L23 from the hot water tank F as flushing hot water (second time) (step LS14). By the second flushing of hot water, the extraction residue LG originally attached/remaining at the lower end of the tank L23 is flushed and falls onto the filter paper LP.

[0652]

5752 Then, the extraction residue discharge process (sub-routine) is executed (step LS15), the main routine in Fig. 129 is ended, and the process returns to the standby state.

5754 Fig. 133 shows the extraction residue discharge process. As shown in this figure, in this subroutine, first, similarly to the aforementioned step LS21, it is determined whether or not the filter paper LP exists (step LS51). In the paper brewing machine LA, the determination result of step LS51 is "YES", and the filter paper LP is fed to a predetermined length (step LS52). As a result, as shown in FIG. 142, the extraction residue LG on the filter paper LP is discharged to ahead. In this case, as shown in this figure, the extraction residue LG is separated from the filter paper LP by the residue separation plate L225 of the paper holder unit L202. Then, the discharged extraction residue LG is accommodated in the lower slag bucket.

[0653]

5764 Through the above, the sale of coffee by the cup vending machine 1LA equipped with the paper brewing machine LA is completed.

[0654]

5769 Next, the coffee cooking operation using the mesh brewing machine LB will be described with reference to the operation diagrams of FIGS. 145 to 164.

5771 Compared with the above-mentioned paper brewing machine LA, the coffee cooking operation performed by the mesh brewing machine LB is different only in the three subroutines of step LS1, step LS9 and step LS15 in the main routine of Fig. 129, other controls are common with the above-mentioned paper brewing machine LA.

5775 Therefore, the following description will focus on these subroutines.

[0655]

5779 In addition, in the mesh brewing machine LB, the discharge direction of the extracted residue can be set in advance to be discharged to the front or rear of the drip unit L21, and can be set to be alternately performed every predetermined number of times (for example, 1 to 10 times). Discharge to the front and rear.

5782 Therefore, in the following description, first, a mesh brewing machine LB in which the discharge direction of the extraction residue is set to the front will be described with reference to the operation diagrams of FIGS. 145 to 155 (hereinafter appropriately referred to as "front discharge mesh brewing machine LB").), the operation of the mesh brewing machine LB in which the discharge direction of the extraction residue is set to the rear (hereinafter appropriately referred to as the "rear discharge mesh brewing machine LB") will be described below with reference to the operation diagrams of FIGS. 156 to 164.

[0656]

5791 Figure 145 shows the standby state of the front-discharge mesh brewing machine LB.

5792 In this standby state, similarly to the above-mentioned paper brewing machine LA, the cam disk L55, the filter block L32, and the cylinder head L101 are located in their respective standby positions. In addition, the scraper L102 is located in the standby position behind the filter block L32. .

[0657]

5798 As shown in Fig. 129, in the main routine of the sales operation, first, in step LS1, an initial process for discharging the extracted residue is executed as a subroutine. In this subroutine, as shown in Fig. 130, it is determined whether Filter paper LP is present (step LS21).

5801 In this example, the mesh brewing machine LB does not have the paper drive unit L203, so the determination result in the above step LS21 is "No", and the process proceeds to step LS22 to determine whether the discharge direction of the extracted residue using the scraper L102 is forward (step LS22) . In the front-discharge network brewing machine LB of this example, the discharge direction of the extracted residue is set to the front, so the judgment result of the above-mentioned step LS22 is "Yes", and this sub-routine ends directly.

[0658]

5810 Returning to the main routine in Fig. 129, steps LS2 to LS8 are executed.

5811 Figures 146, 147, 148, and 149 respectively correspond to Figures 135, 136, 137, and 138 which are operation diagrams of the aforementioned paper brewing machine LA.

[0659]

5816 Next, in step LS9, the coffee extraction process is executed as a subroutine. In this subroutine, as shown in FIG. 131, it is determined whether the filter paper LP is present (step LS31).

5818 In this example, the judgment result of the above-mentioned step LS31 is "No", and step LS33 is executed to end this subroutine. By executing this step LS33, the coffee extracted in the cylinder L23 is filtered by the filter L72 and supplied to the cup W at the cooking position.

[0660]

5824 Returning to the main routine in Fig. 129, steps LS10 to LS14 are executed.

5825 Fig. 150, Fig. 151, and Fig. 152 respectively correspond to Fig. 139, Fig. 140, and Fig. 141 which are operation diagrams of the aforementioned paper brewing machine LA. Furthermore, in this example, in step LS13, the cam disk L55 is rotated to an angular position exceeding the standby position (approximately -40 degrees from the standby position). In this case, as shown in FIG. 152 , the slider L56 is engaged with the proximate portion L61a of the first cam groove L53 of the cam disc L55 via the engaging convex portion L56a. Through the above, after the filter block L32 temporarily descends to the standby position, it rises to a position slightly higher than this position and then stops, and the extraction residue LG remains on the filter screen L72.

[0661]

5835 Next, in step LS15, extraction residue discharge processing is executed as a subroutine.

5836 In this subroutine, as shown in FIG. 133, it is determined whether the filter paper LP exists (step LS51). In this example, the determination result is "No", and the process proceeds to step LS54. In this step LS54, it is determined whether the discharge direction of the extraction residue is set to the front. In this example, the determination result is "YES", and the scraper L102 located in the standby position advances to discharge the extraction residue LG to the front (step LS57). Specifically, the second motor L131 of the cylinder head/scraper driving mechanism L105 rotates in a predetermined direction, thereby rotating the scraper driving part L133 approximately 180 degrees. Thereby, as shown in FIG. 153, the scraper L102 moves from the standby position to the forward extraction slag discharge position. In this case, while the lower end of the scraper body L102b is in sliding contact with the filter screen L72 of the filter block L32, the extraction residue LG on the filter screen L72 is scraped off, and the extraction residue LG is discharged to the front.

[0662]

5849 In addition, after the extraction residue LG is discharged to the front, the first motor L121 of the cam drive mechanism L104 rotates in a predetermined direction, thereby causing the cam disk L55 to rotate a predetermined angle (for example, about 40 degrees) in the clockwise direction in FIG. 151 , return to the standby position.

5853 Thereby, as shown in FIG. 154, the filter block L32 descends slightly and returns to the standby position (step LS58). In this state, a gap is ensured between the filter screen L72 of the filter block L32 and the lower end of the scraper body L102b.

[0663]

5859 Thereafter, the second motor L131 of the cylinder head/scraper driving mechanism L105 rotates in the same direction as described above, whereby the scraper driving part L133 rotates approximately 180 degrees.

5861 Thereby, as shown in FIG. 155, the scraper L102 retreats and returns to the standby position (step LS59).

[0664]

5865 Through the above, the sale of coffee by the cup-type vending machine 1LB equipped with the front-discharge mesh brewing machine LB is completed.

[0665]

5870 Next, the operation of the rear discharge mesh brewing machine LB in which the discharge direction of the extraction residue is set to the rear will be described.

5872 Figure 156 shows the standby state of the rear discharge mesh brewing machine LB.

5873 In addition, this standby state is the same as the above-mentioned front discharge network brewing machine LB, and the scraper L102 is located in the rear standby position.

[0666]

5878 As shown in Fig. 129, in the main routine of the sales operation, first, in step LS1, an initial process for discharging extraction residue is executed as a subroutine. In this subroutine, step LS21 and steps of Fig. 130 are performed. Identification of LS22.

5881 In this step LS22, it is determined whether the discharge direction of the extraction residue discharged by the scraper L102 is forward. In the mesh brewing machine LB of this example, the discharge direction of the extraction residue is set to the rear, so the determination result in the above step LS22 is "NO". , enter step LS23.

[0667]

5888 In this step LS23, the second motor L131 of the cylinder head/scraper driving mechanism L105 rotates in a predetermined direction, thereby rotating the scraper driving part L133 approximately 180 degrees.

5890 Thereby, as shown in FIG. 157, the scraper L102 moves from the standby position to the same position in front as the extraction residue discharge position (hereinafter referred to as the "front standby position").

[0668]

5895 Returning to the main routine in Fig. 129, steps LS2 to LS14 are executed.

5896 Figures 158, 159 to 161, 162, and 163 are respectively the same as Figures 146, 148 to 150, 151, and 150, which are operation diagrams of the aforementioned front discharge network brewing machine LB that performs forward discharge of the extraction residue. 152 corresponds.

[0669]

5902 Next, in step LS15, the extraction residue discharge process is executed as a subroutine. In this subroutine, the determination of steps LS51 and LS54 in Fig. 133 is performed.

5904 This step LS54 determines whether the discharge direction of the extraction residue is forward. In the rear discharge net brewing machine LB in this example, the discharge direction of the extraction residue is set to the rear, so the determination result of the above step LS54 is "No", and the process proceeds Step LS55.

[0670]

5910 In this step LS55, the second motor L131 of the cylinder head/scraper drive mechanism L105 rotates in the same direction as described above, whereby the scraper drive part L133 rotates approximately 180 degrees.

5912 Thereby, as shown in FIG. 164, the scraper L102 moves from the front side standby position to the rear, and thereby discharges extraction residue LG to the rear, and returns to the standby position.

[0671]

5917 Thereafter, the first motor L121 of the cam drive mechanism L104 rotates in a predetermined direction,

whereby the cam disc L55 rotates by a predetermined angle (for example, about 40 degrees) in the clockwise direction in FIG. 164.

5920 Thereby, the filter block L32 descends slightly and returns to the standby position (step LS56, see FIG. 156).

[0672]

5924 Through the above, the sale of coffee by the cup-type vending machine 1LB equipped with the rear discharge net brewing machine LB is completed.

[0673]

5929 Next, the filter L72 will be described.

[0674]

5933 As shown in FIGS. 168 and 169, the filter screen L72 as a filter assembly has a disc-shaped filter body L721, a holding plate (metal plate) L722 provided on the lower side thereof, and a fixing plate for fixing them to each other. Box L723.

5936 The filter body L721 has a mesh portion L721a made of an extremely thin metal material and an outer diameter slightly smaller than the inner diameter of the cylinder L23, and a flange portion L721b provided throughout the entire outer circumference of the mesh portion L721a.

5939 This flange part L721b protrudes laterally from the lower end of the hanging part hanging down from the outer peripheral part of the mesh part L721a.

[0675]

5944 As shown in Figures 170 and 171, the mesh portion L721a is a very thin metal with a thickness Lt0 of 50 μm, and a large number of shallow depressions with a diameter LΦ0 of 100 μm and a depth d1 of 5 to 10 μm are formed on the entire surface of the mesh portion L721a. Pits)L721d.

5947 A large number of filter holes (through holes) L721c for filtering beverages having a pore diameter LΦ1 of 30 μm or less (for example, 20 μm) are passed through the center of the shallow recess L721d.

5949 Since the dimple L721d has a dimple structure with a depth d1 of 5 μm to 10 μm, when the scraper L102 is used to discharge the extraction residue, a hot water film is formed on the dimple (dimple) L721d, thereby reducing the sliding of the scraper L102. resistance.

[0676]

5955 This filter hole L721c is opened so as to penetrate the lower surface (rear surface) L721f of the filter body L721, and is formed into a radial curved cone structure L721g whose diameter increases toward the lower surface L721f (for example, a cone shape with a curved surface radius of 40 μm). (enlarged shape) so that the area of the lower surface L721f is smaller than the area of the sliding surface of the scraper L102.

5959 By forming the filter hole L721c into the radial curved surface cone structure L721g whose diameter increases

toward the lower surface L721f, the tip of the hole entrance portion of the filter hole L721c facing the shallow concave surface L721d can be used as the knife edge L721h. When the scraper L102 is slid to discard the extraction residue, shearing force is strongly exerted on the extraction residue (fine powder of the powdery raw material) blocked in the filter hole L721c by the front end of the scraper L102 in cooperation with the blade edge L721h of the filter hole L721c. It functions to cut off and discharge the extraction residue and prevent the filter hole L721c from being blocked. Furthermore, by using the curved surface tapered structure L721g, the area of the lower surface L721f that cannot be flushed by the liquid flow can be reduced to an extremely small area.

[0677]

5971 Furthermore, these dimples L721d, filter holes L721c, and curved cone structure L721g are formed by electroforming, and the processed surfaces (filter hole inner surface and lower surface L721f) are processed into smooth mirror surfaces.

5974 Thereby, the lower surface L721f can prevent the adhesion and accumulation of dirt of the beverage extract liquid, prevent the deterioration of the taste of the beverage due to dirt, maintain the taste, and maintain hygiene.

[0678]

5980 By setting the pore diameter L Φ 1 of the filter hole L721c to 30 μm or less and processing the inner surface of the filter hole L721c into a smooth mirror surface, the filter hole L721c can ensure that the flow rate of the liquid flow during beverage filtration is above a fixed level and prevent dirt from adhering to the inner surface of the hole. The bridging phenomenon is generated in the holes, which can wash away the dirt attached to the inner surface of the holes when the beverage is filtered, and maintain the cleaning function of the inner surface of the holes.

5986 When the diameter of the filter hole is large (for example, 70 μm), the liquid flow rate during beverage filtration becomes slow, making it difficult to flush away dirt attached to the inner surface of the hole during beverage filtration.

[0679]

5992 By processing the inner surface of the filter hole L721c into a smooth mirror surface, coffee can be filtered without removing the oil content of the coffee beans. Therefore, coffee containing aroma components that are removed when using the filter paper LP can be filtered.

[0680]

5998 In addition, since the filter hole L721c is as small as the pore diameter L Φ 1 of 30 μm or less, it is possible to completely separate the fine powder contained in the raw material and filter the beverage. There is no residue left in the filtered beverage, so it is possible to filter out a transparency higher than that when using filter paper. of beverages and can stabilize the filtration time of the beverages.

[0681]

6005 Furthermore, as shown in FIG. 172, the depth d2 of the straight hole (vertical portion) L721e of the filter hole L721c may be 15 μm or less.

6007 By setting the filter hole L721c to a straight hole L721e of 15 μm or less in this way, the extraction residue (fine powder of the powder raw material) blocked in the filter hole L721c can be cooperated with the edge of the front end of the entrance portion of the scraper L102 This allows the shearing force to act strongly to cut and discharge the extraction residue, prevent clogging of the filter hole L721c, and improve the durability of the filter body L721.

[0682]

6015 The holding plate L722 has a disc-shaped support part L722a and a fixing part L722c having an L-shaped cross section provided over the entire outer circumference.

6017 This fixed part L722c protrudes laterally from the lower end part of the hanging part hanging downward from the outer peripheral part of the support part L722a.

6019 In addition, the diameter of the support part L722a is slightly smaller than the mesh part L721a.

6020 In addition, the thickness of the support portion L722a is set so as to ensure sufficient rigidity to maintain the shape of the support portion L722a with respect to the load acting when the cylinder head/scraper drive mechanism L105 operates. In addition, a large number of holes L722b are formed on substantially the entire surface of the support portion L722a. The holes L722b are arranged in a mesh shape and have a diameter much larger than the filter holes L721c of the mesh portion L721a (for example, 4 mm).

[0683]

6028 The fixed frame L723 is formed in an annular shape by a side wall L723a and an upper wall L723b protruding inwardly from an upper end thereof.

6030 The holding plate L722 is fitted into the fixed frame L723 with the filter main body L721 sandwiched therebetween. The fixing portion L722c of the holding plate L722 is pressed into the inside of the side wall L723a of the fixed frame L723, whereby the filter main body L721 The flange part L721b is sandwiched between the upper wall L723b and the fixing part L722c, and these three parts are integrated. In addition, in this state, the entire upper surface of the support portion L722a of the holding plate L722 is in contact with the mesh portion L721a of the filter body L721.

[0684]

6039 As described above, according to the filter L72, the liquid flow rate during beverage filtration can be ensured to be above a fixed level, dirt adhering to the inner surface of the holes can be prevented from bridging in the holes, and dirt adhering to the holes can be washed away during beverage filtration. Dirt on the inner surface can maintain the cleaning function of the inner surface of the hole.

6043 In addition, the beverage can be filtered by completely separating the fine powder contained in the raw

material, and no residue is left in the filtered beverage. Therefore, a beverage with a transparency higher than that of the filter paper can be filtered, and the filtration time of the beverage can be stabilized. In addition, for the extraction residue blocked in the filter hole L721c, the front end of the scraper L102 cooperates with the edge of the front end of the entrance portion of the filter hole L721c to strongly exert a shearing force to cut and discharge the extraction residue, preventing the filter hole L721c from being blocked. occlusion, and can improve the durability of filter L72.

[0685]

6053 < Mixing Bowl M >

[0686]

6057 First, the cup-type vending machine 1 equipped with the mixing bowl M will be described with reference to FIG. 173.

6059 The cup-type automatic vending machine 1 shown in FIG. 173 is positioned as a medium-sized one, and an interior lamp M100 is provided at the left end of the top surface, and an ice maker G is provided below it along the left wall.

6062 A liquid reservoir E is provided on the right side of the ice machine G, and a water pump E1 connected to the warm water tank F is installed in the liquid reservoir E. On the lower side of the ice maker G, a water pump E1 for drinking water is provided in the middle of the left wall. The ice machine G is disposed behind the cup-type vending machine 1. An extraction raw material supply mechanism D-2, a grinder K, and a brewing mechanism L are provided on the front side of the ice maker G, but they are omitted in FIG. 173.

[0687]

6070 A cooling unit N is provided at the left end of the floor surface, and a cooling water tank N1 is provided above the cooling unit N and below the water pump E1.

[0688]

6075 Inside the cup-type vending machine 1, a plurality of bag inboxes P7 to P9 storing syrup raw liquid are arranged on the floor, and one or more cylindrical water supply tanks E32 are arranged as needed.

6077 The syrup raw liquid in the bag-in-box P7~P9 is sucked out by the independent syrup pumps P1~P3, and the drinking water in the water supply tank E32 is sucked out by the auxiliary pump E30, and is supplied to the liquid reservoir E, the ice maker G, the cooking position, etc. respectively.

[0689]

6083 Inside the cup-type vending machine 1, a powder raw material supply mechanism D-1 is provided approximately in the upper right half.

6085 A stirring mechanism J is provided in the lower half of the left side of the powder raw material supply

mechanism D-1.

6087 A hot water tank F is arranged on the back side of the powder raw material supply mechanism D-1. In addition, a cup supply mechanism C is provided on the front side of the powder raw material supply mechanism D-1, but it is omitted in FIG. 173.

[0690]

6093 A mixing bowl M is installed under the rightmost tank among the plurality of tanks D10 of the powder raw material supply mechanism D-1.

[0691]

6098 Fig. 174 is a cross-sectional side view of the mixing bowl M, and Fig. 175 is a cross-sectional view along line c8-c8 in Fig. 174.

6100 The mixing bowl M includes a mixing container M11 and a cover body M12 to which the mixing container M11 is mounted. The mixing bowl M is supported in the cup-type vending machine 1 by the cover body M12.

6103 In addition, the cover body M12 is provided with the stirring motor M21 of the stirring device M20 in the center, and is provided with a hot water inlet M13 connected to the hot water pipeline via the hot water valve of the hot water tank F, and a hot water inlet M13 connected to the hot water pipeline via the chute D20. A raw material input port M17 for introducing the powder raw material stored in the tank D10 and an exhaust passage M18 connected to a fan not shown in the figure.

[0692]

6111 Furthermore, a hot water downflow groove M14 connected to the hot water inlet M13 via the hot water passage M13a is formed in an annular shape on the outer peripheral surface of the cover body M12.

6113 A protrusion M15a (see FIG. 176) is provided on the peripheral wall M15 forming the hot water flowing down groove M14, and the hot water flows down along the inner surface M11a of the stirring container M11 from the gap M16 formed between the inner surface M11a of the stirring container M11 and the protrusion M15a.. Adjustment is made so that the amount of hot water supplied to the hot water inlet M13 is larger than the amount of hot water flowing down from the gap M16. Therefore, the flushing hot water flows down from the entire gap M16 throughout the hot water flow down groove M14.

[0693]

6122 The stirring device M20 includes a vertical shaft M23 and cooking stirring blades M24 and valve blades M25 respectively mounted on the vertical shaft M23. The upper end of the vertical shaft M23 is connected to the stirring motor M21 via a joint M22.

6125 The cooking stirring blade M24 and the valve blade M25 have a valve function that prevents the mixed liquid or hot water from flowing down as they rotate, and also have a function of stirring and mixing (cooking) the powdery raw materials and hot water.

[0694]

6131 The stirring container M11 is formed of a synthetic resin into a deformable funnel shape so that the beverage can be stirred efficiently, and has a stirring device M20 inside it.

6133 The upper end of the stirring container M11 is widely opened, and is detachably attached to the cover body M12 so as to fit into the cover body M12. In addition, a beverage pouring part M19 having a discharge port M19a in the lower part is installed. The axial end of the vertical axis M23 of the stirring device M20 is covered with the beverage pouring part M19, and the cooked beverage is poured into the cup W from the beverage pouring part M19.

[0695]

6141 In addition, by coating the inner surface M11a of the stirring container M11 with a hydrophilic material, the contact angle of the inner surface M11a with water (hereinafter also referred to as the water contact angle) is 50° or less, preferably 5° or more and 20° . ° below the size.

6144 The water contact angle can be set in a specific range by the following method. For example, when Hydrotect coating (manufactured by TOTO) containing titanium oxide fine particles is used as the hydrophilic material, the water contact angle can be maintained at about 10° by regularly irradiating the stirring container M11 with ultraviolet light to visible light. In addition, when a hydrophilic material containing polysilazane (manufactured by CLARIANT JAPAN) is used as the hydrophilic material, after applying the hydrophilic material, it is heated or in a high-temperature and high-humidity environment. By silicon-converting the coating film, the water contact angle can be approximately 20° or less. When the hydrophilic material is used for coating, it has the following advantages: it can form a hard film like quartz and is less likely to be scratched when the stirring container M11 is removed for cleaning.

[0696]

6156 The flushing hot water flowing through the stirring container M11 whose inner surface M11a has been hydrophilized flows down the entire inner surface M11a as shown in Figure 177, thereby washing away the beverage adhering to the inner surface M11a (the hollow star in Figure 177) , therefore the cleanliness of the inner surface M11a of the stirring container M11 can be maintained.

[0697]

6163 FIG. 178 shows the relationship between the amount of beverage adhering to the stirring container M11 and the number of times the beverage is sold (cooked).

6165 This figure shows that compared with the inner surface of a conventionally used molded article (for example, polypropylene), when the inner surface M11a is hydrophilized so that the water contact angle is about 20° , Even if the number of beverage sales increases, the amount of beverage adhesion remains small.

[0698]

6171 <Cooling unit N>

[0699]

6175 As shown in Fig. 179, the cooling unit N is a refrigeration circuit for cooling the ice maker G and the cooling water tank N1.

6177 The cooling unit N has a structure in which the cooling water tank N1, the refrigerant piping on the compressor N2 side, and the refrigerant piping on the ice machine G side can be attached and detached via attachment and detachment mechanism portions N3 and N4 such as couplings.

[0700]

6183 The cooling unit N includes a compressor N2, a condenser N5, an evaporator N6 provided in the cooling water tank N1, and a refrigerant passage G13 provided in the ice machine G that functions as an evaporator. These devices are connected by refrigerant piping. to form a refrigeration circuit.

[0701]

6189 The refrigerant pipe on the discharge side of the compressor N2 branches into two branches after passing through the condenser N5 and the dryer N8 and becomes the refrigerant pipes N9 and N10.

6191 One refrigerant pipe N9 is provided with a solenoid valve N11, a capillary tube N12, an evaporator N6, and a converging part N13 in order downstream from the branch point with the refrigerant pipe N10, and is finally connected to the suction side of the compressor N2.

6194 The other refrigerant pipe N10 is provided with a solenoid valve N14, a loading and unloading mechanism part N3, an expansion valve N15, a refrigerant passage G13, and a loading and unloading mechanism part N4 in order downstream from the branch point with the refrigerant pipe N9. At the merging part N13 It joins the refrigerant pipe N9 and is connected to the suction side of the compressor N2.

[0702]

6201 When cooling the cooling water tank N1, the cooling unit N opens the solenoid valve N11 on the refrigerant pipe N9 side, closes the solenoid valve N14 on the refrigerant pipe N10 side, and then operates the compressor N2.

6204 Thereby, the high-temperature refrigerant pressurized by the compressor N2 is cooled and condensed by the condenser N5, passes through the dryer N8, and then flows into the refrigerant pipe N9.

6206 The refrigerant flowing into the refrigerant pipe N9 is decompressed by the capillary tube N12 and then evaporates in the evaporator N6 to cool the cooling water stored in the cooling water tank N1.

6208 The refrigerant leaving the evaporator N6 passes through the merging portion N13 and returns to the suction side of the compressor N2. In addition, the fan N17 and the condenser N5 are arranged close to each other. The outside air introduced from the suction port provided in the unit base N18 via the air filter N19 passes through the condenser N5 and is discharged from the discharge port to the outside.

[0703]

6215 On the other hand, when operating the ice maker G, the cooling unit N opens the solenoid valve N14 on the refrigerant pipe N10 side and closes the solenoid valve N11 on the refrigerant pipe N9 side, and then operates the compressor N2.

6218 Thereby, the high-temperature refrigerant pressurized by the compressor N2 is cooled and condensed by the condenser N5, passes through the dryer N8, and then flows into the refrigerant pipe N10. The refrigerant flowing into the refrigerant pipe N10 passes through the attachment and detachment mechanism part N3, is decompressed by the expansion valve N15, and evaporates in the refrigerant passage G13, thereby making ice in the ice machine G. The refrigerant leaving the refrigerant passage G13 passes through the attachment and detachment mechanism part N4 and the merging part N13, and then returns to the suction side of the compressor N2.

[0704]

6228 In addition, the compressor N2 and the condenser N5, which are heavy objects, are arranged at the lower part of the equipment case 2 so as to fall on the unit base N18. On the other hand, the ice maker G that supplies ice to the cup W by its own weight is arranged. on the upper part of the equipment housing 2.

6231 Specifically, as shown in FIG. 179, almost all the equipment of the cooling unit N is arranged below the cooling water tank N1, and only the refrigerant passage G13, the expansion valve N15 and the ice maker G are arranged above the cooling water tank N1. Therefore, in the cooling unit N, the attachment and detachment mechanism portions N3 and N4 can be disconnected to separate the refrigerant passage G13, the expansion valve N15, the ice maker G and the refrigerant piping connecting them from the compressor N2 side. Thereby, each device of the cooling unit N can be easily installed in the upper and lower parts of the device case 2, and manufacturing efficiency improves.

[0705]

6241 FIG. 180 is a plan view schematically showing the structure of each device arranged in the cooling water tank N1.

6243 FIG. 181 is a longitudinal cross-sectional view schematically showing the structure of each device arranged in the cooling water tank N1.

[0706]

6248 The cooling unit N cools the cooling water stored in the cooling water tank N1 using the evaporator N6 to generate ice cubes, and cools the water cooling coil E41, the plurality of syrup cooling coils N21, and the carbonator immersed in the cooling water tank N1. Q to cool down.

6251 Furthermore, the cooling water tank N1 is provided with a stirring device N22 for stirring the cooling water. The water cooling coil E41 causes the drinking water supplied from the reservoir E to pass through the cooling water filled with the cooling water tank N1, thereby cooling the drinking water. The syrup cooling

coil N21 cools the syrup liquid supplied from the bag-in-box (BIB) by passing the cooling water filled in the cooling water tank N1. FIG. 180 illustrates a structure in which three syrup cooling coils N21 are arranged to correspond to three types of syrup liquids. The carbonator Q efficiently dissolves carbonic acid gas in water while being cooled by being immersed in the cooling water in the cooling water tank N1 to produce carbonated water.

[0707]

6262 In the cooling water tank N1, the evaporator N6 is piped in such a manner that the evaporator N6 is bent into a U-shape and stacked along the inner surface N1a of the central region of the cooling water tank N1, and in the U-shaped evaporator The water cooling coil E41, which is spirally wound in several layers, is arranged inside the N6.

6266 Furthermore, inside the spiral water cooling coil E41, the carbonator Q and the stirring device N22 are arranged substantially side by side in the horizontal direction. A hollow water supply guide N23 is provided around the stirring device N22 so as to surround the stirring member N22a. Furthermore, a syrup cooling coil N21 spirally wound in the transverse direction is provided on the open side of the U-shaped evaporator N6 so as to face the open side of the U-shaped evaporator N6. In addition, between the inner surface side of the evaporator N6 formed in a U-shape and the outer periphery of the spirally wound water cooling coil E41, there is provided a space where ice generated around the evaporator N6 cannot reach. The water cooling coil E41 is spaced inside it. Similarly, the same degree of spacing is provided between the syrup cooling coil N21 arranged on the open side of the evaporator N6 and the open side end of the evaporator N6.

[0708]

6279 In addition, an electrode type control sensor N24 for detecting ice generated around the evaporator N6 is provided around the evaporator N6.

6281 The control sensor N24 detects the resistance between the electrode (not shown) installed in the water and does not grow ice, and utilizes the different properties (resistance value) of ice and water (the resistivity of ice is greater than the resistance of water). rate) to control the ice thickness (size) of the ice cubes generated around the evaporator N6. Furthermore, using the ice cubes generated around the evaporator N6 as a heat storage source, the cooling water filling the cooling water tank N1 is stirred and circulated by operating the stirring device N22, and the drinking water passing through the water cooling coil E41 is , the syrup liquid passing through the syrup cooling coil N21 and the carbonated water generated by the carbonator Q are cooled. In addition, reference symbol N22b in FIG. 181 is the motor of the stirring device N22.

[0709]

6292 <Syrup supply mechanism P>

[0710]

6296 As shown in FIG. 182, the syrup supply mechanism P includes syrup pumps P1 to P3 and syrup supply lines P4 to P6.

6298 The syrup supply mechanism P is a mechanism that supplies the syrup in the bag-in-box (BIB) P7 to P9 to the cup W.

[0711]

6303 Bag-in-box P7 to P9 store syrup original solution.

6304 The syrup pumps P1 to P3 are pumps that suck out the syrup raw liquid from the bag-in-box P7 to P9 respectively and eject it.

6306 In the case of this embodiment, the syrup pumps P1 and P2 are gear pumps, and the syrup pump P3 is a bellows type pump.

[0712]

6311 The syrup supply lines P4 to P6 are pipes for supplying the syrup raw liquids discharged from the syrup pumps P1 to P3 to the cup W respectively.

6313 Syrup cooling coils N21 immersed in the cooling water tank N1 are respectively provided in the middle of the syrup supply lines P4 to P6. In the syrup supply lines P4 and P5, syrup valves P10 and P11 are respectively provided at positions between the syrup cooling coil N21 and the cup W. Syrup valves P10 and P11 are, for example, electromagnetic on-off valves, and control whether syrup raw liquid can be supplied to cup W from syrup supply lines P4 and P5.

[0713]

6321 Therefore, in this syrup supply mechanism P, when a sales signal is sent during normal sales, the syrup pumps P1 to P3 operate appropriately, and the syrup raw liquids in the bags in boxes P7 to P9 are sent to the syrup supply lines P4 to P6.

6324 Next, the syrup raw liquid is cooled to a predetermined temperature in the syrup cooling coil N21, and then supplied to the cup W. The syrup raw solution poured into the cup W is diluted with drinking water and carbonated water from the carbonator Q as needed, and then is provided to the user. In addition, after the bellows-type syrup pump P3 delivers the syrup raw liquid, it performs a suction operation to suck the syrup raw liquid into the inside from the bag-in-box P9. Then, when the syrup pump P3 is filled with syrup raw solution, the suction operation is stopped and the pump P3 waits until the next sales signal.

[0714]

6333 As shown in FIG. 183, gear-type syrup pumps P1 and P2 have, for example, a structure in which a pair of gears P13 and P14 are provided in a pump body P15 and are rotationally driven by a motor P12.

6335 A pair of gears P13 and P14 mesh with each other. Furthermore, the syrup undiluted liquid can be discharged between the gears P13 and P14 that rotate in opposite directions, and the discharge amount of the syrup undiluted liquid can be controlled by controlling the rotational speeds of the gears P13 and P14.

[0715]

6341 As shown in FIGS. 184 to 188, the bellows-type syrup pump P3 has a structure in which a bellows P17 is used to seal a piston P16 driven by a link mechanism.

6343 The syrup pump P3 is provided with a cylinder P19 that also serves as a storage portion for the syrup raw liquid on one side surface of the main body P18 having a built-in mechanism. A suction port P20 and a discharge port P21 are provided at the front end of the cylinder P19. The pipe from the bag-in-box P9 is connected to the suction port P20, and the syrup supply line P6 is connected to the discharge port P21. A check valve P20a is attached to the suction port P20, and a check valve P21a is attached to the discharge port P21.

[0716]

6352 The piston P16 is fitted inside the cylinder P19 via an O-ring.

6353 A rod P23 hangs from the lower surface of the piston P16. The bellows P17 having flanges at both ends is installed between the lower surface of the piston P16 and the lower end of the cylinder P19 so that the flanges at both ends are sandwiched. The bellows P17 is an elastic membrane formed in a gradually expanding cylindrical shape, and isolates the inside of the cylinder P19 from the outside air on the main body P18 side. The bellows P17 is a sealing member that prevents foreign matter such as dust from entering the cylinder P19 from the main body P18 side and ensures the reciprocating motion of the piston P16.

[0717]

6362 A gear motor P26 is provided inside the main body P18, and a cam P27 is mounted on its output shaft.

6363 The first link arm P29 is pivotally supported on the drive pin P28, and the drive pin P28 is pivotally supported on the outer periphery of the cam P27. The first link arm P29 has a substantially L-shape, and the bent portion of the L-shape is pivotally supported by a pivot pin P30 protruding from the main body P18. An elongated hole P29a is formed on one end side of the first link arm P29, and the drive pin P28 is inserted into the elongated hole P29a so as to be capable of advancing and retracting in the longitudinal direction. One end of the second link arm P31 is pivotally supported on the other end side of the first link arm P29 using a connection pin P32. The end of the rod P23 on the side opposite to the piston P16 is connected to the other end of the second link arm P31 using a connection pin P33. The first link arm P29 and the second link arm P31 constitute a link mechanism that converts the rotational force of the gear motor P26 into the reciprocating motion of the piston P16. This link mechanism is configured to include a second link arm P31 disposed along the rod P23 of the piston P16 and an L-shaped first link arm P29, thereby smoothly converting the rotational force from the gear motor P26. For linear motion, the piston P16 can be pushed straight.

[0718]

6379 A standby position switch P35 is provided adjacent to the cam P27.

6380 The standby position switch P35 detects the rear end position which is the standby position of the piston P16 via the cam P27. The standby position switch P35 has a detection part P35a on the side surface on the cam P27 side. The detection part P35a is pressed and turned on by the switch contact member P36 which moves forward and backward by the cam P27. The switch contact member P36 moves by contacting the outer peripheral surface of the cam P27 and the recessed portion P27a formed in a part of the outer peripheral surface, thereby turning the standby position switch P35 on and off.

[0719]

6389 A motor rotation sensor P38 is attached to the gear motor P26.

6390 The syrup pump P3 is a fixed displacement pump that can control the stroke of the piston P16 by detecting the rotation speed of the gear motor P26 using the motor rotation sensor P38 and can be set to a predetermined constant amount.

[0720]

6396 Therefore, in this syrup pump P3, when the gear motor P26 is energized to rotate the cam P27, the drive pin P28 moves in a circle.

6398 The circular motion of the drive pin P28 is converted into a linear motion by the first link arm P29 and the second link arm P31 and then transmitted to the rod P23. In the state shown in FIG. 185, the piston P16 is in the standby position returned to the rear surface of the cylinder P19, and the cylinder P19 is filled with the syrup raw liquid. When the sales signal is received from this state and the gear motor P26 rotates forward by an amount equivalent to the set pulse, the piston P16 moves forward via the first link arm P29 and the second link arm P31 as the link mechanism, and the cylinder P19 The syrup liquid inside is sprayed out (see Figure 186). After the required amount of syrup raw liquid is ejected, the gear motor P26 is rotated in the reverse direction to rotate the cam P27 in the reverse direction. Thereby, the switch contact member P36 returns to the recessed part P27a from the outer peripheral surface of the cam P27, and the pressing state of the detection part P35a of the standby position switch P35 by the switch contact member P36 is released. As a result, the standby position switch P35 is turned off, and the gear motor P26 stops at the off point (see Fig. 187). During this period, the syrup stock solution is attracted into the cylinder P19 again.

[0721]

6413 In addition, the standby position switch P35 can adjust the stroke of the piston P16, that is, the discharge amount of the syrup raw solution, by adjusting its operating point (off point).

6415 For example, loosen the fixing screw P39 in FIG. 185 to adjust the position of the standby position switch P35 (detection part P35a) with respect to the cam P27. Thereby, as shown in FIG. 187, when the piston P16 retracts to suck the syrup raw liquid, the standby position switch P35 can be turned off when the piston P16 is positioned at the retracted end (rear surface of the cylinder P19). In addition, the standby position switch P35 has, for example, a structure in which the detection part P35a is turned on and off by the elastic piece P35b pressed by the switch contact member P36. Therefore, for example, the turn-on point of the standby position switch P35 can be adjusted so that the protrusion length P40 of the detection portion P35a is, for

example, 0.3 mm to 0.5 mm while the standby position switch P35 is pressed by the switch contact member P36.

[0722]

6427 <Carbonator Q>

[0723]

6431 As shown in FIG. 189, the carbonator Q is a device that generates carbonated water by immersing the inside of a sealed container Q1 disposed in the cooling water tank N1.

6433 The carbonator Q mixes the carbonic acid gas supplied from the carbonic acid cylinder Q2 with the drinking water supplied from the reservoir E through the water cooling coil E41 to generate carbonated water.

6435 The generated carbonated water is supplied to the cup W. A water supply joint Q3, an air supply joint Q4, and a carbonated water spout joint Q5 are provided on the upper surface of the airtight container Q1.

[0724]

6440 As shown in FIGS. 189 and 190, the branch pipe branched from the water cooling coil E41 immersed in the cooling water tank N1 is connected to the water supply joint Q3 via the electromagnetic water supply valve E44.

6443 The water supply joint Q3 is connected to the water injection nozzle Q7 protruding into the sealed container Q1. The water spray nozzle Q7 is a nozzle that pressurizes downward and sprays drinking water from the upper part in the sealed container Q1. In addition, one side of the branch pipe branched from the water cooling coil E41 is connected to the water supply joint Q3, and the other side is a cold water supply line that supplies cold water to the cup W via the electromagnetic cold water valve E42.

[0725]

6451 The gas pipe Q9 from the carbonic acid gas cylinder Q2 is connected to the gas supply joint Q4.

6452 The gas supply joint Q4 is connected to the gas nozzle protruding into the sealed container Q1. Thereby, the carbonic acid gas stored in the carbonic acid gas cylinder Q2 is introduced into the sealed container Q1 via the gas pipe Q9, the gas supply joint Q4, and the gas nozzle.

[0726]

6458 The carbonated water discharge joint Q5 is connected to a carbonated water outlet pipe Q10 hanging down in the sealed container Q1 and a carbonated water supply line E43 for supplying carbonated water to the cup W.

6461 The carbonated water outlet pipe Q10 is a pipe for extracting the carbonated water generated in the sealed container Q1 from the bottom side to the outside. The carbonated water outlet pipe Q10 sucks up the carbonated water from under the receiving tray Q12 arranged at the lower part of the sealed container Q1.

Thereby, for example, even if drinking water is supplied from the water injection nozzle Q7 into the sealed container Q1, it is possible to prevent carbonated water gas from being mixed into the carbonated water outlet pipe Q10. An electromagnetic carbonated water valve E45 is provided in the carbonated water supply line E43.

[0727]

6471 Therefore, this carbonator Q generates carbonated water by spraying drinking water from the water injection nozzle Q7 in an environment in which carbonic acid gas is supplied from the carbonated gas bottle Q2 through the gas supply joint Q4 and the gas nozzle into the sealed container Q1.

6474 The generated carbonated water is stored in the sealed container Q1 and is supplied to the cup W from the carbonated water outlet pipe Q10 via the carbonated water supply line E43 as needed. In addition, a float switch Q14 is provided at a position capable of floating in the carbonated water stored in the sealed container Q1. The carbonator Q executes the carbonated water generating operation when, for example, the storage amount of carbonated water detected by the float switch Q14 is equal to or less than a predetermined amount.

[0728]

6483 <Drainage mechanism A>

[0729]

6487 As shown in FIGS. 191 and 192, the drain mechanism A includes a drain container A1, a drain tray A10, a drain switch A2, a drain pan A3, and an electrode switch A4.

6489 The drainage mechanism A is used to store the drainage of drinking water, beverages, cleaning water, etc. that overflows from various mechanisms in the equipment housing 2.

[0730]

6494 The drain container A1 is a barrel-shaped container that stores the above-mentioned drain water.

6495 The drain water stored in the drain container A1 is discarded during maintenance or the like.

6496 The drain tray A10 is a receiving member arranged substantially horizontally inside the equipment case 2 at a location above the drain container A1, and its peripheral edge is bent upward. As is clear from the figure, the drain tray A10 has a larger area than the drain container A1 and is provided to cover the raw material supply mechanism D, the liquid reservoir E, the chlorine generator B, the warm water tank F, the ice maker G, the cup transport mechanism H, and Below the stirring mechanism J, the grinder K, the brewing mechanism L, the cooling unit N, the syrup supply mechanism P, the carbonator Q, and the outlet mechanism S described below. This drain tray A10 is provided with a drain passage A11 that opens toward the inside of the drain container A1.

[0731]

6507 The drain switch A2 is a switch that detects the water level in the drain container A1.

6508 The drain switch A2 is a float switch having a float A7 that turns on and off the microswitch A6 supported on the mounting base A5. The float A7 hangs down from one end of the strip-shaped detection piece A6a via the rope A8, and is arranged in the drainage container A1.

[0732]

6514 When the water level in the drainage container A1 rises and the float A7 rises to a predetermined water level as the water level rises, the microswitch A6 is turned on.

6516 The control unit R of the cup vending machine 1 stops the water supply from the water pipe opening and the water supply tank E32 based on the ON signal from the micro switch A6.

[0733]

6521 As shown in FIG. 191, the drain pan A3 is arranged, for example, on the lower surface side of the bottom panel A9 of the equipment case 2 and outside the equipment case 2.

6523 The drain pan A3 is a container that receives the overflowing drainage water from the drainage container A1 due to a malfunction of the electromagnetic water supply valves E3 and E4 that control the water supply from the water pipe opening to the reservoir E, for example.. Electrode switch A4 is a sensor that detects drain water stored in drain pan A3. When the electrode switch A4 detects water leakage to the drain pan A3, the control unit R of the cup vending machine 1 cuts off the water supply to the electromagnetic water supply valves E3 and E4 that control the water supply from the water pipe opening to the reservoir E, for example. power ups. As a result, the electromagnetic water supply valves E3 and E4 are forcibly closed, thereby forcibly stopping further flow of water into the reservoir E.

[0734]

6534 As shown in FIG. 193, the drain pan A3 may be disposed on the upper surface side of the bottom panel A9 and inside the equipment case 2.

6536 In this case, the drain container A1 is arranged in the drain pan A3, for example.

[0735]

6540 <Remove Export Mechanism S>

[0736]

6544 As the outlet mechanism S, there are an automatic door type outlet mechanism S-1 and a manual door type outlet mechanism S-2.

6546 First, the automatic door type take-out port mechanism S-1 will be described.

[0737]

6550 <Automatic door type exit mechanism S-1>

[0738]

6554 The automatic door type take-out opening mechanism S-1 is a portion for the user to take out the cup W filled with the drink, and is provided substantially in the center of the front surface of the front door 3.

[0739]

6559 As shown in FIGS. 194, 195 and 196, the outlet mechanism S-1 has a front outlet door S10, a front frame S12, a rectangular holder S14 protruding inward, and an outlet door opening and closing motor S16, damper (damper) S18 and remove the door lock solenoid S20.

6562 In addition, the outlet mechanism S-1 has an outlet door closing detection switch S22, a pair of outlet cup detection sensors S24a, S24b, and outlet lighting S26.

[0740]

6567 The front frame S12 is an attachment part for attaching the front door 3 of the cup type vending machine 1, and is the base part of the outlet mechanism S-1.

6569 The take-out door S10 is a translucent door that opens and closes the front frame S12.

6570 The take-out door S10 is hinged on the left side and opens on the right side when viewed from the front.

6571 An engaging piece S10a is provided on the right end of the take-out door S10 when viewed from the front.

6572 The engaging piece S10a is provided with a notch for engaging.

[0741]

6576 The exit door opening and closing motor S16 is a DC gear motor and is provided at an upper end portion of the back side of the front frame S12 to open and close the exit door S10.

6578 The damper S18 is a part that transmits the rotation of the exit door opening and closing motor S16 to the exit door S10, and functions as a limiter when excessive force is applied, and also functions as an operation cam of the actuator.

[0742]

6584 The holder S14 is a receiving place for conveying the cups W from the cup conveying mechanism H. The holder S14 protrudes rearward from the front frame S12 and is open on the rear side. The front side is opened and closed by the take-out door S10.

6587 A pair of reinforcing ribs S28 are provided on the left and right inner sides of the cage S14, and a protruding piece S30 protrudes rearward from the vicinity of the lower end of each reinforcing rib S28.

[0743]

6592 The pair of left and right reinforcing ribs S28 have a shape in which the upper portions are spaced apart from each other and become narrower toward the lower portion.

6594 This shape allows the holder S14 to adapt to the shape of the cup W so that the upper opening is large and the lower opening is small.

[0744]

6599 As shown in FIG. 197, the guide piece H183 of the cup transport mechanism H movable in the XY direction is inserted between the pair of protruding pieces S30 and the position in the X direction is fixed.

6601 Therefore, even if the user applies force to the cup W and the cup conveying mechanism H in the X direction, the displacement of the cup W and the cup conveying mechanism H is restricted by contact with the protruding piece S30, so that the cup W can be placed stably. In addition, as will be described later, the cup transport mechanism H is also fixed in the Y direction.

[0745]

6608 The take-out cup detection sensors S24a and S24b are provided on the left and right walls of the holder S14 so as to face each other.

6610 The cup removal detection sensor S24a is a light-emitting element for detecting that the cup W has been transported into the holder S14, and the cup removal detection sensor S24b is a light-receiving element corresponding to the light-emitting element. The height of the removed cup detection sensors S24a and S24b is set between the table H181 of the cup transport mechanism H and the cup baffles H182L and H182R so that the optical axis shown by the dotted line is not blocked by anything other than the cup W. The reinforcing rib S28 is also provided at a position away from the optical axis. Therefore, the take-out cup detection sensors S24a and S24b can detect only the cup W without being affected by the stage H181 and the cup shutters H182L and H182R.

[0746]

6621 The bottom surface S14a of the holder S14 is gently inclined so as to descend from the front side to the back side. Even if the beverage overflows into the holder S14, it can flow inward (the front side in FIG. 195) and be discharged to the tray without contaminating the front surface. Surface door 3, floor surface.

[0747]

6627 A tray is provided below the outlet mechanism S-1 and the cup transport mechanism H.

6628 The tray is used to catch overflowing drinks and raw materials, and the caught drinks and raw materials flow into a drainage container mounted on the lower right side of the inside of the equipment housing 2 through the drainage hose.

[0748]

6634 Returning to Figures 194 to 196, the take-out door lock solenoid S20 is a solenoid that locks the take-out door S10 in a closed state during standby and preparation for supplying the cup W, and engages the engaging piece S10a/ freed.

6637 W hen preparation for providing the cup W in the holder S14 is completed, the outlet door lock solenoid S20 releases the engaging piece S10a from the engaged state, allowing the outlet door S10 to be opened.

6639 By locking the outlet door S10 in the closed state with the outlet door lock solenoid S20, it is possible to prevent the user from inadvertently inserting his hand into the outlet mechanism S-1 before preparation for supplying the cup W is completed.

[0749]

6645 The exit door closing detection switch S22 is a switch that detects whether the exit door S10 is in a closed state.

[0750]

6650 The take-out port lighting S26 is LED lighting that illuminates the cup W conveyed into the holder S14, and is provided on the upper surface of the holder S14.

6652 The take-out port lighting S26 can brighten the user's hand when taking out the cup W, and can provide a high-end feel.

6654 The illumination start time of the take-out port illumination S26 may be, for example, the time when the cup W is carried into the holder S14. The illumination ending time of the outlet lighting S26 may be, for example, the time when the outlet cup detection sensors S24a and S24b confirm that the outlet cup W has been taken out, or the outlet door closing detection switch S22 determines that the outlet door S10 is closed thereafter. time point.

[0751]

6662 The extraction port mechanism S-1 functions as follows.

6663 That is, when the entrance of the cup W containing the beverage is confirmed by the outlet cup detection sensors S24a and S24b, the closing lock of the outlet door S10 is released by the outlet door lock solenoid S20. Then, the exit door S10 is opened by forward rotation of the exit door opening and closing motor S16. The opening of the exit door S10 is detected by the exit door closing detection switch S22. The removal port cup detection sensors S24a and S24b detect that the user has taken out the cup W, and after a predetermined time has elapsed, the delivery port door opening and closing motor S16 is reversely rotated to close the delivery port door S10. The exit door closing detection switch S22 detects that the exit door S10 is closed. Thereafter, under the action of the exit door lock solenoid S20, the exit door S10 is closed and locked.

[0752]

6674 On the other hand, even if the cup W is not taken out from the outlet within a predetermined time, this is detected by the outlet cup detection sensors S24a and S24b, and the outlet door opening and closing motor S16 blocks the outlet door S10. Lock by removing the door lock solenoid S20.

[0753]

6680 In this case, the cup holding device H12 can be moved from the outlet mechanism S-1 to the cooking position by driving the XY stage H10 of the cup transport mechanism H-1 for the cup W arranged in the outlet mechanism S-1.

6683 Then, after the stirring paddle J10 is lowered and inserted into the cup W, the XY stage H10 is driven, whereby the cup holding device H12 is moved to a position deeper than the cooking position, and the cup W containing the beverage is dropped from the stage H181 to below.

6686 In this way, the cup W containing the beverage falls onto the drain tray A10, and the contained beverage flows into the drain container A1. Therefore, by raising the stirring paddle J10 and moving the cup holding device H12 to the standby position via the cooking position, the next beverage sale can be prepared.

[0754]

6692 < Manual door type take-out port mechanism S-2>

[0755]

6696 The outlet mechanism S-2 shown in FIG. 198 has the same basic structure as the outlet mechanism S-1 except that the outlet door opening and closing motor S16 is omitted.

6698 In the exit mechanism S-2, the exit door S10 is a manual type.

[0756]

6702 The extraction port mechanism S-2 functions as follows.

6703 That is, when the entrance of the cup W containing the beverage is confirmed by the outlet cup detection sensors S24a and S24b, the closing lock of the outlet door S10 is released by the outlet door lock solenoid S20.

6706 Then, the user opens the exit door S10. The opening of the exit door S10 is detected by the exit door closing detection switch S22. The removal port cup detection sensors S24a and S24b detect that the cup W has been taken out by the user. After that, when the user releases his hand, the removal port door S10 is automatically closed. The take-out door S10 is automatically closed using a spring (not shown). The exit door closing detection switch S22 detects that the exit door S10 is closed. Thereafter, under the action of the exit door lock solenoid S20, the exit door S10 is closed and locked.

[0757]

6715 The process when the cup W is not taken out from the outlet within a predetermined time is the same as the

process of the automatic door type outlet mechanism.

[0758]

6720 <Control function>

[0759]

6724 <Position correction function>

[0760]

6728 Next, several control functions of the control unit R in the cup-type vending machine 1 will be described.

6729 First, the position correction function is explained.

[0761]

6733 The cup-type vending machine 1 requires positioning accuracy of the cup holding device H12 and the cup W by the cup conveying mechanism H (see FIG. 76), and is provided with a position correction function for this purpose.

6736 The positioning adjustment of the position correction function is performed at the time of shipment from the factory, when the equipment is disassembled and assembled, or when an error occurs for some reason, so that the following positions can be individually adjusted under the control of the control unit R. Correction.

[0762]

6742 That is, a position that receives the supply of raw materials from the raw material supply mechanism D; a cooking position that uses the stirring mechanism J to stir the cup W containing coffee, hot water, powdered raw materials, etc.; and a cup discarding position that discards unnecessary cups W; The outlet mechanism S provides a position where a cup W containing a drink is provided; a sales standby position, etc.

6746 Specifically, in the position correction mode, the cup conveying mechanism H is used to move the cup holding device H12 to each position, and the service personnel measure the X-direction error and the Y-direction error between the target position and control the direction in mm. Department R performs numerical input/registration.

[0763]

6753 Thereafter, the control unit R recognizes the input numerical value as the correction amount, moves the cup holding device H12 to the corrected position in each operation during actual sales preparation, and offsets the error.

6756 As a result, service personnel can basically make adjustments in a short time just by simple operations of error measurement and key input.

[0764]

6761 In addition, the correction amount input by the service personnel can be stored in a USB memory connected to the control unit R, and can be loaded into other cup vending machines 1 or checked on a personal computer.

[0765]

6767 < Hygiene function>

[0766]

6771 Next, the hygienic function will be explained.

6772 The cup vending machine 1 has several sanitary functions to clean the flow path through which the drinking water passes to keep it clean.

6774 Depending on the type of the sanitary function, there are sanitary functions that are performed completely automatically under the control of the control unit R and sanitary functions that are partially performed by service personnel based on instructions from the control unit R.

6777 Hygiene functions include, for example, the hygiene functions known as hot hygiene, cold hygiene and automatic flushing.

[0767]

6782 In thermal sanitation, the flow path through which hot water flows is cleaned.

6783 Specifically, in the thermal hygiene mode, the control unit R flows hot water to the cylinder L23 of the brewing mechanism L (see FIG. 102) to perform preliminary cleaning.

6785 Next, following the guidance of the control part R, the service personnel inserts a predetermined amount of chemical (for example, bleach) from the raw material input port L37a of the brewing mechanism L, and then, under the control of the control part R, hot water is circulated to inject the inside of the cylinder L23 The surface is cleaned with chemicals.

6789 Then, circulate hot water several times to perform rinsing, and then complete the thermal sanitation.

[0768]

6793 In cold sanitation, the flow path through which drinking water flows is cleaned.

6794 Specifically, in the cold sanitary mode, following the guidance of the control unit R, the service personnel pours a predetermined amount of chemical (for example, bleach) from the reservoir E.

6796 Thereafter, under the control of the control unit R, the water into which the chemical is injected is circulated in the flow path where the drinking water flows to perform cleaning. Then, after draining the water in which the chemical has been added, the cold system sanitation is completed after rinsing several times with water in which no chemical has been added.

[0769]

6803 The automatic flushing is performed completely automatically and periodically under the control of the control unit R, and hot water is circulated to the tank L23 of the brewing mechanism L and the mixing container M11 of the mixing bowl M for cleaning.

6806 The execution timing of automatic flushing can be set arbitrarily, for example, once a day, once a week, or every set number of sales, and at night when there are few users.

[0770]

6811 It is also possible for service personnel to completely manually perform sanitation of the flow path without relying on the function of the control unit R.

[0771]

6816 <User Support Function>

[0772]

6820 Next, the user support function is explained.

6821 The cup-type vending machine 1 is provided with several user support functions for providing better services to users.

[0773]

6826 Among them, the raw material increase and decrease function is a function to increase or decrease coffee raw materials, sugar, cream, etc. according to the user's preference, and can be designated by an increase switch and a decrease switch provided on the surface of the front door 3.

6829 Each increase or decrease may be designated as multiple levels.

[0774]

6833 The ice-free function is a function for not adding ice to a cold drink according to the user's preference, and can be designated by an ice-free switch provided on the surface of the front door 3.

[0775]

6838 The lidless function is a function of omitting the cup lid according to the user's judgment in models with a function of attaching a cup lid to the cup W, and can be designated by the lidless switch provided on the surface of the front door 3.

[0776]

6844 The personal cup (my cup) function is a function that provides drinks to the user's own personal cup instead of the standard paper cup W, and can be specified using the personal cup switch provided on the surface of the front door 3.

6847 When the personal cup function is designated, first the outlet door S10 of the outlet mechanism S (see FIG. 194) is unlocked, and the user can open the outlet door S10 and place a personal cup.

6849 When the sensor detects that a personal cup is placed, the control unit R locks the take-out door S10 in a closed state.

6851 Then, the subsequent beverage pouring/stirring process is performed on the personal cup, and the personal cup into which the beverage is poured is transported to the outlet mechanism S.

6853 When the personal cup switch is pressed but the personal cup is not detected within a predetermined time, the personal cup function is stopped and a drink is poured into the paper cup W and served as usual.

[0777]

6858 <Results presentation function>

[0778]

6862 Generally speaking, unlike a vending machine that sells canned drinks, in the cup-type vending machine 1, it takes some time until a drink is provided.

6864 Furthermore, this time varies depending on the model of the cup vending machine 1 and the type and amount of the drink, so the user does not know how long it takes to wait.

6866 In addition, when preparation for serving the drink is completed, the user needs to be notified.

6867 Therefore, the cup-type vending machine 1 has several functions for notifying the user of the required waiting time and several functions for notifying the completion of preparations for serving drinks.

[0779]

6872 The countdown function is a function that displays the time until the drink is served in units of seconds on a numerical display provided on the front door 3.

6874 The numerical display may also serve as a temperature display for displaying the temperature of the hot water tank F during the sales standby period. Through the countdown function, users can directly identify the time they need to wait.

[0780]

6880 The multi-indicator lighting function appropriately lights up a plurality of (for example, about five) indicators such as LEDs arranged on the front door 3, and displays an outline of the beverage preparation process based on, for example, the number of lit indicators. Function.

6883 Specifically, initially the indicator on one end flashes, then the indicator on one end switches from flashing to

on, and the second indicator flashes. The indicators gradually flash/light up in sequence like this, and finally the beverage preparation process is completed at the point when the indicator on the other end switches from flashing to lighting up. In the multi-indicator lighting function, as the beverage preparation process progresses, the number of indicator lights may be sequentially reduced from the fully lit state. Through the multi-indicator lighting function, the user can identify a rough estimate of the time required to wait.

[0781]

6892 The extraction process indicator function is a function of appropriately lighting up indicators such as a plurality of (for example, about five) LEDs arranged on the front door 3 to display the beverage preparation process stage at that point in time.

6895 The extraction process indicator function is used, for example, when selling coffee, to prepare indicators corresponding to beverage preparation processes such as the release process of extracted raw materials, the grinding process, the extraction process, the stirring process, and the conveying process. When selling coffee, the indicator corresponding to the process stage at the current time point is lit or flashed. Alternatively, like the multi-indicator lighting function described above, the number of lighting indicators may be increased or decreased according to the process stage. By extracting the process indicator function, the user can specifically identify the progress status of the beverage preparation process.

[0782]

6905 The outlet lighting function is a function of illuminating the cup W with the outlet lighting S26 when the cup W containing the beverage is carried into the outlet mechanism S (see FIG. 196) and preparation for serving the beverage is completed.

6908 Through the outlet lighting function, the user can recognize that preparation for serving the beverage is completed, and the inside of the outlet mechanism S becomes bright so that the cup W can be easily taken out. In addition, the exit lighting function can also give the cup-type vending machine 1 a high-end feel.

[0783]

6914 The automatic door function is a function that automatically opens the outlet door S10 when the cup W containing the beverage is carried into the outlet mechanism S (see FIG. 196) and preparation for serving the beverage is completed.

6917 When it is detected that the cup W has been taken out, the take-out door S10 is automatically closed. Through the automatic door function, the user can recognize that the preparation for serving the beverage has been completed, and can take out the cup W with one hand without opening and closing the take-out door S10. In addition, this automatic door function can give the cup-type vending machine 1 a high-end feel.

[0784]

6925 The light flashing function causes all or part of the lights (including the button inner light) provided on the

front door 3 to be turned on when the cup W containing the drink is carried into the outlet mechanism S (see FIG. 196) and preparation for serving the drink is completed. Flashing function.

6928 Many lights provided on the front surface door 3 are conspicuous when blinking, so the user can easily recognize that preparation for serving drinks is completed.

[0785]

6933 It is also possible to notify the user that preparations for serving drinks are completed through a buzzer, sound, or the like.

[0786]

6938 <layout>

[0787]

6942 The internal layout of the equipment housing 2 in the four models of the cup-type vending machines 1 will be described respectively.

[0788]

6947 < Medium-sized cup vending machine 1-1>

[0789]

6951 First, the medium-sized cup-type automatic vending machine 1-1 will be described with reference to FIGS. 199 and 200.

6953 The medium-sized cup-type vending machine 1-1 is used when the number of cups to be sold is large, the amount of beverage raw materials to be stored inside the device casing 2 and the number of cups to be accommodated are large.

[0790]

6959 As shown in Figure 199, in the medium-sized cup-type automatic vending machine 1-1, inside the equipment housing 2, an interior lamp T100 is provided at the left end of the top surface, and an ice-making lamp T100 is provided on the inner side along the left wall. Machine G.

6962 A liquid reservoir E is provided on the right side of the ice machine G, and a water pump E1 connected to the warm water tank F is installed in the liquid reservoir E.

6964 On the lower side of the ice maker G, a water pump E1 for drinking water is provided in the middle of the left wall.

6966 On the front side of the ice maker G, an extraction raw material supply mechanism D-2 (see FIG. 200) that stores coffee beans, a grinder K, and a brewing mechanism L are provided.

[0791]

6971 A cooling unit N is provided at the left end of the floor surface, and a cooling water tank N1 is provided above the cooling unit N and below the water pump E1.

6973 The cooling unit N and the cooling water tank N1 are arranged below the ice maker G, and are suitable for connecting the two through pipes.

6975 A dam switch T106 is provided on the lower right side of the cooling unit N.

6976 If liquid accumulates on the floor surface of the equipment case 2 for some reason, the dam switch T106 detects this situation, and the control unit R takes necessary measures such as stopping the system.

[0792]

6981 Inside the equipment casing 2, a plurality of bags-in-boxes P7 to P9 storing syrup raw solutions are arranged on the floor surface, and one or more cylindrical water supply tanks E32 are arranged as needed.

6983 The syrup raw liquid stored in the bag-in-box P7 to P9 is sucked out by the same number of syrup pumps P1 to P3. On the other hand, the drinking water in the water supply tank E32 is sucked out by the auxiliary pump E30 and supplied to the liquid reservoir E and the ice machine G respectively. and cooking position, etc.

[0793]

6990 Inside the equipment housing 2, a powder raw material supply mechanism D-1 is provided approximately in the upper right half.

6992 The powder raw material supply mechanism D-1 has a plurality of (eight in Fig. 199) tanks D10 arranged side by side in the lateral width direction, and a chute D20 installed under each tank D10. A stirring mechanism J is provided in the lower half of the left side of the powder raw material supply mechanism D-1. Similarly, a cleaning tool F60 is provided at the upper end of the left side. The locking portion holding the cleaning tool F60 is provided at a position such that the nozzle F61 at the front end is located higher than the hot water water surface in the hot water tank F. An exhaust fan T110 is provided at the left lower end of the powder raw material supply mechanism D-1.

[0794]

7002 As shown in FIG. 200, a hot water tank F is arranged on the back side of the powder raw material supply mechanism D-1.

7004 Two types of circular cup supply mechanisms C-2 are provided on the front side of the powder raw material supply mechanism D-1.

[0795]

7009 The medium-sized cup-type vending machine 1-1 is provided with a hinge T116 for opening and closing the

front door 3 on the left side of the front.

7011 Inside the equipment casing 2, the ice maker G is arranged at the innermost side of the left end, and an extraction raw material supply mechanism D-2 is provided on the front side thereof. The front surface of the extraction raw material supply mechanism D-2 is close to the front door 3, and if the front door 3 is opened, maintenance can be easily performed. On the left side of the extraction raw material supply mechanism D-2, a power box T118 is provided on the left wall of the equipment housing 2.

[0796]

7019 The ice maker G has a roughly circular shape when viewed from above, and its diameter is relatively large, but smaller than the lateral width of the main equipment arranged on the right.

7021 The extraction raw material supply mechanism D-2 has a relatively small width in the lateral direction and a relatively large width in the depth direction. If the ice maker G and the extracted raw material supply mechanism D-2, which have a relatively large width in the depth direction, are arranged in the depth direction, the depth direction width inside the equipment housing 2 will be substantially filled. In addition, since the lateral width of the extracted raw material supply mechanism D-2 is relatively small, the power supply box T118 can be arranged on the left side. In this way, the ice making machine G and the extracted raw material supply mechanism D-2, which have a relatively large width in the depth direction, are arranged together in the left portion of the inside of the equipment casing 2, forming a layout without waste. Furthermore, compared with the ice making machine G which is almost maintenance-free, the extracted raw material supply mechanism D-2 requires raw material supply, parts supply and maintenance, and is easy to operate by being installed on the front surface side.

[0797]

7035 A warm water tank F, a powder raw material supply mechanism D-1, and two types of round cup supply mechanisms C-2 are provided in this order from the center to the right side inside the equipment housing 2.

[0798]

7040 The two types of circular cup supply mechanisms C-2 can be opened to the front side using the hinge T120 provided on the right wall of the equipment housing 2, thereby exposing the powder raw material supply mechanism D-1 on the back side.

7043 The front door 3 is opened to the left, and the two round cup supply mechanisms C-2 are opened to the right. This allows the respective openings to be large, and the powder raw material supply mechanism D-1 can be easily accessed. maintenance.

[0799]

7049 The warm water tank F has a small width in the depth direction, but its lateral width is larger than the lateral width of the ice maker G.

7051 Both the depth direction width and the lateral width of the two circular cup supply mechanisms C-2 are

larger than the warm water tank F.

7053 The depth direction width of the powder raw material supply mechanism D-1 is about the same as that of the two circular cup supply mechanisms C-2, but the lateral width is about half that of the medium-sized cup type vending machine 1-1, which is relatively large.

[0800]

7059 From the center to the right side of the equipment casing 2, the hot water tank F with a wide lateral width, the powder raw material supply mechanism D-1, and the two round cup supply mechanisms C-2 are arranged in a concentrated manner without any space. waste.

7062 In particular, since the width of the hot water tank F in the depth direction is small, the powder raw material supply mechanism D-1 and the two types of circular cup supply mechanisms C-2 can be further arranged in the same row. The two round cup supply mechanisms C-2 are located close to the front door 3, making it easy to replenish cups W and other operations. By opening the two round cup supply mechanisms C-2 with the hinge T120, the powder raw material supply mechanism D-1 is exposed, making it easy to perform operations such as raw material replenishment. Warm water tank F is generally maintenance-free and has a relatively high temperature, so it is placed at the innermost side to avoid inadvertent contact. The hot water tank F is arranged above, so a high water head pressure can be obtained, making it easy to supply hot water to various parts of the machine.

[0801]

7074 In this way, according to the medium-sized cup-type vending machine 1-1, the ice maker G, which requires relatively space for installation, and the two round cup supply mechanisms C-2 and the powder raw material supply mechanism D-1 are arranged inside the equipment casing 2 Since the front and rear dimensions can be reduced, the device can be prevented from being enlarged.

[0802]

7081 <Small cup vending machine 1-2>

[0803]

7085 Figure 201 shows an internal top view of the device housing 2 in the small cup-type vending machine 1-2.

7086 The small cup-type vending machine 1-2 is smaller than the medium-sized cup type vending machine 1-1, and is used when the number of cups sold is medium, and the amount of beverage raw materials stored in the equipment casing 2 is large, and the cups are The number of accommodations is slightly less.

[0804]

7092 In the medium-sized cup-type vending machine 1-1, eight tanks D10 of the powder material supply mechanism D-1 are arranged side by side. In contrast, in the small cup-type vending machine 1-2, the

powder material supply mechanism D-1 has eight tanks D10 arranged side by side. -1 tank D10 is 6 side by side.

7096 In addition, in the medium-sized cup type vending machine 1-1, two types of round cup supply mechanisms C-2 are used, whereas in the small-sized cup type vending machine 1-2, a single type of round cup is used. The entire width of the supply mechanism C-1 and the small cup-type vending machine 1-2 is also reduced by an amount corresponding to the lateral width of these mechanisms.

7100 The small cup-type vending machine 1-2 is the same as the cup-type vending machine 1-1 except for the powder raw material supply mechanism D-1 and the single-type round cup supply mechanism C-1, and the front view and detailed description thereof are omitted. .

7103 The small cup-type vending machine 1-2 has the same layout effect as the medium-sized cup type vending machine 1-1.

[0805]

7108 <Compact Cup Vending Machine 1-3>

[0806]

7112 Figures 202 and 203 illustrate a compact cup vending machine 1-3.

7113 The compact cup-type vending machine 1-3 is smaller than the small cup-type vending machine 1-2, and is used when the number of cups sold is medium, the amount of beverage raw materials stored inside is large, and the number of cups can be accommodated is slightly larger. few.

[0807]

7119 In the medium-sized cup-type vending machine 1-1, eight tanks D10 of the powder material supply mechanism D-1 are arranged side by side. In contrast, in the compact cup-type vending machine 1-3, the powder material supply mechanism D -1 tank D10 is 7 side by side.

[0808]

7125 In addition, in the medium-sized cup-type vending machine 1-1, two tanks D10 of the extraction raw material supply mechanism D-2 are arranged side by side. In contrast, in the compact cup-type vending machine 1-3, the extraction raw material supply mechanism D-2 has two tanks D10 arranged side by side. There are three supply mechanisms D-2 arranged side by side, and the horizontal width is slightly larger.

7129 In the medium-sized cup-type vending machine 1-1, the power box T118 is installed on the left wall. On the other hand, in the compact cup-type vending machine 1-3, the lateral width of the extraction raw material supply mechanism D-2 is Correspondingly, the power box T118 is disposed slightly below the back surface of the device housing 2 .

7133 In the medium-sized cup type vending machine 1-1, two types of round cup supply mechanisms C-2 are used, whereas in the compact cup type vending machine 1-3, a single type of square cup supply mechanism is used. C-4.

7136 In addition, in the compact cup-type vending machine 1-3, a small warm water tank F is used, and the bags in the box P7 to P9 are omitted. The compact cup-type vending machine 1-3 also has the same layout effect as the medium-sized cup-type vending machine 1-1.

[0809]

7142 < Ultra-compact cup vending machine 1-4>

[0810]

7146 Figures 204 and 205 illustrate an ultra-small cup-type vending machine 1-4.

7147 The ultra-small cup vending machines 1-4 are smaller than the compact cup vending machines 1-3. They are used in offices, etc. to save space and have multiple menus. The amount of beverage ingredients stored inside and the storage of cups are The number is slightly less.

[0811]

7153 In the ultra-compact cup-type vending machine 1-4, the front door 3 is a left-opening type that is opened and closed by a hinge T116 provided on the right side.

[0812]

7158 In the ultra-small cup-type vending machine 1-4, a warm water tank F is provided at the upper end of the left side inside, and a single square cup supply mechanism C-4 and an extraction raw material supply mechanism D- are arranged side by side in front of it. 2.

7161 The single-type square cup supply mechanism C-4 is arranged with the long side direction as the depth direction, making efficient use of space.

[0813]

7166 An exhaust fan T110 is provided below the single square cup supply mechanism C-4, and a grinder K and a brewing mechanism L are provided below.

[0814]

7171 Inside the ultra-small cup-type vending machine 1-4, an ice maker G is provided at the upper end of the right side, and a power box T118 is provided on the right wall in front of the ice maker.

[0815]

7176 Inside the ultra-small cup-type vending machine 1-4, a powder raw material supply mechanism D-1 is provided in front of the middle floor.

7178 The powder raw material supply mechanism D-1 and the extracted raw material supply mechanism D-2 partially overlap when viewed from above, but the former is installed above and the latter is installed in the middle layer, so there will be no interference.

7181 The grinder K and the brewing mechanism L are installed at a position slightly offset downward from the extraction raw material supply mechanism D-2 and near the left wall, thereby ensuring the arrangement space of the powder raw material supply mechanism D-1.

7184 A slag container T119 is provided below the brewing mechanism L, and a DC power supply relay box T122 placed on the floor is provided further below.

[0816]

7189 Inside the ultra-small cup-type vending machine 1-4, a cooling unit N is provided slightly lower and on the right side, and a chlorine generator control box B10 is provided in the center.

7191 A slag container T119 is provided on the left side of the chlorine generator control box B10.

[0817]

7195 Below the cooling unit N, a cooling unit filter T126, a drain container switch T128, and a water filter T130 are provided.

7197 A dam switch T106 is provided near the lower floor surface.

[0818]

7201 The ultra-small cup-type vending machine 1-4 is approximately opposite to the medium-sized cup-type vending machine 1-1, but has substantially the same layout effect as the medium-sized cup-type vending machine 1-1.

7204 In addition, the ultra-compact size was achieved through careful attention to layout.

Notice

CLAIMS CN109389755A

1.

13 A cup-type automatic vending machine, equipped inside the equipment housing:

14 A cup supply mechanism that supplies cups sequentially from the filled cup row;

15 a raw material supply mechanism that stores powder raw materials as raw materials for beverages in a tank and supplies the powder raw materials to the cup from the tank;

17 an ice maker that generates ice and supplies ice to the cup; and

18 a warm water tank that supplies hot water stored in the hot water tank to the cup,

19 The cup-type vending machine generates a drink by supplying powder raw materials and hot water to the cup, and is characterized by:

21 The device case has an opening on the front surface, and a front door is supported on the opening edge of the device case. The front door opens and closes the device by a hinge having a hinge axis along a vertical direction. The front surface of the housing is open,

24 Inside the device housing, the ice maker and power box are disposed on the side where the hinge is provided, and the warm water tank and cup supply are disposed on the opening and closing door side of the front surface door. mechanism.

2.

30 The cup type vending machine according to claim 1, characterized in that:

31 The cup supply mechanism is attached to the device casing in a state in which the cup supply mechanism can be pulled out to the front of the device casing with the front surface door opened.

3.

36 The cup type vending machine according to claim 2, characterized in that:

37 The tank is arranged between the warm water tank and the cup supply mechanism.

4.

41 The cup type vending machine according to claim 1, characterized in that:

42 The ice maker is arranged on the inner side of the power box, and the warm water tank is arranged on the inner side of the cup supply mechanism.

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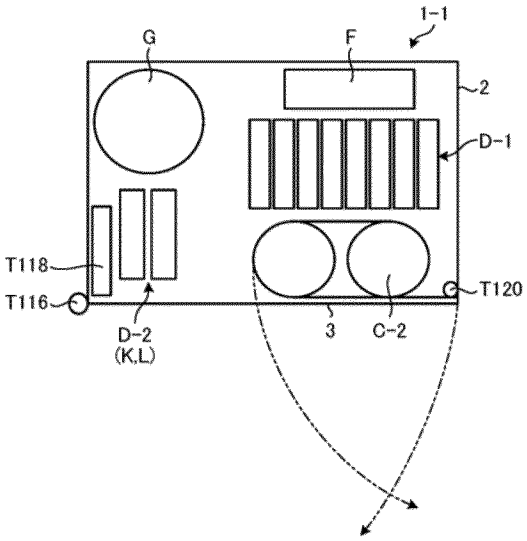
(54)发明名称

杯式自动售货机

(57)摘要

一种杯式自动售货机(1),在设备壳体(2)的内部具备:杯供给机构(C),其从所装填的杯列(WK)依次进行杯(W)的供给;原料供给机构(D),其将作为饮料的原料的粉末原料贮存在罐(D10)中,且从罐(D10)对杯进行粉末原料的供给;制冰机(G),其进行冰的生成,且对杯(W)进行冰的供给;以及温水箱(F),其对杯(W)进行贮存于该温水箱内部的热水的供给,杯式自动售货机(1)通过向杯(W)供给粉末原料和热水来进行饮料的生成,在该杯式自动售货机(1)中,设备壳体(2)在前表面具有开口,且在设备壳体(2)的开口缘部支承有前表面门(3),该前表面门(3)通过具有沿着铅直方向的铰链轴的铰链(T116)来开闭设备壳体(2)前表面开口,在设备壳体(2)的内部,在设置有铰链(T116)的一侧配置有制冰机(G)和电源盒(T118),在前表面门(3)的开关门侧配置有温水箱(F)和杯供给机构(C),从而防止了大型化。



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1.一种杯式自动售货机，在设备壳体的内部具备：

杯供给机构，其从所装填的杯列依次进行杯的供给；

原料供给机构，其将作为饮料的原料的粉末原料贮存在罐中，且从所述罐对所述杯进行粉末原料的供给；

制冰机，其进行冰的生成，且对所述杯进行冰的供给；以及

温水箱，其对所述杯进行贮存于该温水箱内部的热水的供给，

所述杯式自动售货机通过向所述杯供给粉末原料和热水来进行饮料的生成，所述杯式自动售货机的特征在于，

所述设备壳体在前表面具有开口，且在所述设备壳体的开口缘部支承有前表面门，该前表面门通过具有沿着铅直方向的铰链轴的铰链来开闭所述设备壳体的前表面开口，

在所述设备壳体的内部，在设置有所述铰链的一侧配置有所述制冰机和电源盒，在所述前表面门的开关门侧配置有所述温水箱和所述杯供给机构。

2.根据权利要求1所述的杯式自动售货机，其特征在于，

所述杯供给机构以如下状态安装于所述设备壳体：在打开所述前表面门的状态下，所述杯供给机构能够被拉出到所述设备壳体的前方。

3.根据权利要求2所述的杯式自动售货机，其特征在于，

所述罐配置在所述温水箱与所述杯供给机构之间。

4.根据权利要求1所述的杯式自动售货机，其特征在于，

所述制冰机配置于比所述电源盒靠里侧的位置，且所述温水箱配置于比所述杯供给机构靠里侧的位置。

杯式自动售货机

技术领域

[0001] 本发明涉及一种杯式自动售货机。

背景技术

[0002] 杯式自动售货机与销售罐装饮料的自动售货机相比，配设于设备壳体的内部的机构有多种。即，如果是销售罐装饮料的自动售货机，则只要在设备壳体的内部设置收纳罐装饮料的货道(column)即可。与此相对，在杯式自动售货机的情况下，需要在设备壳体的内部生成饮料并将该饮料供给到杯后运出，因此至少需要下述的机构部。

[0003] • 杯供给机构，其进行杯的供给；

[0004] • 原料供给机构，其将作为饮料的原料的粉末原料贮存在罐中，且从罐对所供给的杯进行粉末原料的供给；

[0005] • 制冰机，其进行冰的生成，且对所供给的杯进行冰的供给；

[0006] • 温水箱，其对所供给的杯进行贮存于该温水箱内部的热水的供给。

[0007] 专利文献1：日本特开2009-276986号公报

发明内容

[0008] 发明要解决的问题

[0009] 因而，作为杯式自动售货机而言，在防止大型化的方面以下问题是极为重要的：如何将上述的各机构部高效地配置在设备壳体的内部。

[0010] 本发明鉴于上述实际情况，其目的在于提供一种能够防止大型化的杯式自动售货机。

[0011] 用于解决问题的方案

[0012] 为了达到上述目的，本发明所涉及的杯式自动售货机在设备壳体的内部具备：杯供给机构，其从所装填的杯列依次进行杯的供给；原料供给机构，其将作为饮料的原料的粉末原料贮存在罐中，且从所述罐对所述杯进行粉末原料的供给；制冰机，其进行冰的生成，且对所述杯进行冰的供给；以及温水箱，其对所述杯进行贮存于该温水箱内部的热水的供给，所述杯式自动售货机通过向所述杯供给粉末原料和热水来进行饮料的生成，所述杯式自动售货机的特征在于，所述设备壳体在前表面具有开口，且在所述设备壳体的开口缘部支承有前表面门，该前表面门通过具有沿着铅直方向的铰链轴的铰链来开闭所述设备壳体的前表面开口，在所述设备壳体的内部，在设置有所述铰链的一侧配置有所述制冰机和电源盒，在所述前表面门的开关门侧配置有所述温水箱和所述杯供给机构。

[0013] 另外，本发明的特征在于，在上述的杯式自动售货机中，所述杯供给机构以如下状态安装于所述设备壳体：在打开所述前表面门的状态下，所述杯供给机构能够被拉出到所述设备壳体的前方。

[0014] 另外，本发明的特征在于，在上述的杯式自动售货机中，所述罐配置在所述温水箱与所述杯供给机构之间。

[0015] 另外，本发明的特征在于，在上述的杯式自动售货机中，所述制冰机配置于比所述电源盒靠里侧的位置，且所述温水箱配置于比所述杯供给机构靠里侧的位置。

[0016] 发明的效果

[0017] 根据本发明，比较需要设置空间的制冰机与杯供给机构及原料供给机构在设备壳体的内部配置于左右，因此能够实现前后的尺寸的小型化，从而能够防止装置的大型化。

附图说明

[0018] 图1是示意性地表示杯式自动售货机的框图。

[0019] 图2是杯式自动售货机的正视图。

[0020] 图3是杯式自动售货机的侧视图。

[0021] 图4表示图1所示的杯供给机构的具体例，(a)是单种圆形杯供给机构的外观立体图，(b)是两种圆形杯供给机构的外观立体图，(c)是单种圆形+单种单列杯供给机构的外观立体图，(d)是单种方形杯供给机构的外观立体图。

[0022] 图5是图4的(a)所示的单种圆形杯供给机构的放大立体图。

[0023] 图6是将图5所示的单种圆形杯供给机构的主要部分放大后的分解立体图。

[0024] 图7表示图5所示的单种圆形杯供给机构，(a)是侧视图，(b)是(a)中的c1-c1线剖视图。

[0025] 图8是图5所示的单种圆形杯供给机构所应用的落杯环的分解立体图。

[0026] 图9是图5所示的单种圆形杯供给机构所应用的落杯环的截面俯视图。

[0027] 图10表示图5所示的单种圆形杯供给机构所应用的驱动机构和落杯环，(a)是主要部分立体图，(b)是俯视图。

[0028] 图11是在(a)～(c)中依次概念性地表示通过图5所示的单种圆形杯供给机构所应用的落杯环使杯分离的状态的侧视图。

[0029] 图12是在(a)～(c)中依次概念性地表示图5所示的单种圆形杯供给机构的圆形杯收纳器中收纳的杯列的输送动作的截面俯视图。

[0030] 图13是在(a)和(b)中依次概念性地表示接着图12的(c)实施的杯列的输送动作的截面俯视图。

[0031] 图14是在(a)和(b)中依次概念性地表示图5所示的单种圆形杯供给机构的圆形杯收纳器中收纳的杯列的返回动作的截面俯视图。

[0032] 图15是图4的(b)所示的两种圆形杯供给机构的放大立体图。

[0033] 图16是概念性地表示图15所示的两种圆形杯供给机构的内部构造的截面俯视图。

[0034] 图17是图4的(c)所示的单种圆形+单种单列杯供给机构的放大立体图。

[0035] 图18是概念性地表示图17所示的单种圆形+单种单列杯供给机构的内部构造的截面俯视图。

[0036] 图19放大表示图4的(d)所示的单种方形杯供给机构，(a)是外观立体图，(b)是表示内部的立体图。

[0037] 图20表示图19的(b)所示的单种方形杯供给机构，(a)是俯视图，(b)是正视图。

[0038] 图21是图20的(b)中的c2-c2线剖视图。

[0039] 图22表示图19所示的单种方形杯供给机构中应用的底部引导件，(a)是俯视图，

(b)是正视图。

[0040] 图23表示图19所示的单种方形杯供给机构中应用的驱动装置，(a)是后视图，(b)是俯视图。

[0041] 图24依次表示在图19所示的单种方形杯供给机构中从右侧的预备货道向销售货道补充预备杯列的补充动作，(a)是表示销售动作开始前的状态的俯视图，(b)和(c)是预备杯列移动到销售货道侧的状态的俯视图。

[0042] 图25表示接着图24的(c)实施的预备杯列的补充动作，(a)是预备杯列即将落下至杯列给送口的状态的俯视图，(b)是预备杯列被补充到销售货道的状态的俯视图，(c)是表示推棒恢复为待机位置的状态的俯视图。

[0043] 图26是表示作为图1所示的原料供给机构的具体例的粉末原料供给机构的结构的外观立体图。

[0044] 图27是使图26所示的粉末原料供给机构的一部分断裂来表示的立体图。

[0045] 图28是表示图26所示的粉末原料供给机构的罐的截面侧视图。

[0046] 图29是图28所示的罐的分解立体图。

[0047] 图30是表示图26所示的粉末原料供给机构的滑槽的主要部分截面侧视图。

[0048] 图31是图30所示的滑槽所配设的闸门的立体图。

[0049] 图32是图30所示的滑槽所配设的加热器的概念图。

[0050] 图33是使图26所示的粉末原料供给机构所应用的闸门开闭装置的一部分断裂来表示的立体图。

[0051] 图34是省略了图33所示的闸门开闭装置的外壳后的立体图。

[0052] 图35是表示图33所示的闸门开闭装置的主要部分的放大立体图。

[0053] 图36表示图33所示的闸门开闭装置的主要部分，(a)是右侧视图，(b)是左侧视图。

[0054] 图37表示图33所示的闸门开闭装置的闸门开闭杆，(a)是右侧视图，(b)是左侧视图。

[0055] 图38表示图33所示的闸门开闭装置的选择杆，(a)是右侧视图，(b)是左侧视图。

[0056] 图39表示图33所示的闸门开闭装置的凸轮装置，(a)是右侧视图，(b)是左侧视图。

[0057] 图40表示图33所示的闸门开闭装置的动作，是由杯输送机构的外壳按压选择杆的状态的侧视图。

[0058] 图41表示图33所示的闸门开闭装置的动作，是杯返回到滑槽的下方的状态的侧视图。

[0059] 图42是在(a)～(c)中依次表示图33所示的闸门开闭装置的动作的侧视图。

[0060] 图43表示图33所示的闸门开闭装置的动作，是闸门开闭杆将闸门开放的状态的侧视图。

[0061] 图44表示图33所示的闸门开闭装置的动作，是使闸门旋转来进行振动从而使粘着的粉末原料掉落的状态的侧视图。

[0062] 图45表示滑槽所配设的加热器的发热基准面，(a)是弯曲的加热器的横截面图，(b)是弯曲2次的加热器的横截面图，(c)是弯折的加热器的横截面图。

[0063] 图46是表示作为图1所示的原料供给机构的具体例的提取原料供给机构的罐的截面侧视图。

[0064] 图47是图46所示的提取原料供给机构的罐的分解立体图。

[0065] 图48是示意性地表示图1所示的杯式自动售货机的饮用水供给系统的图。

[0066] 图49是表示图1所示的储液器的具体结构的外观立体图。

[0067] 图50是使图49所示的储液器局部断裂的立体图。

[0068] 图51是图49所示的储液器的截面正视图。

[0069] 图52是图49所示的储液器的截面侧视图。

[0070] 图53表示图49所示的储液器的主要部分，(a)是将棒位置保持轴插入到上方的插入孔的状态的截面侧视图，(b)是将棒位置保持轴插入到下方的插入孔的状态的截面侧视图。

[0071] 图54是表示图48所示的储液器的变形例的外观立体图。

[0072] 图55表示图54所示的储液器，(a)是表示检测棒的突片不受约束的状态的俯视图，(b)是使突片位于棒罩的插入部的状态的俯视图。

[0073] 图56是表示图48所示的饮用水供给系统的主要部分的图。

[0074] 图57是表示氯发生电极的结构例的正视图。

[0075] 图58是表示氯发生电极的结构例的侧视图。

[0076] 图59是表示氯发生量与氯发生电极的电流/电压之间的关系的图。

[0077] 图60是表示第一变形例所涉及的氯发生电极的结构例的正视图。

[0078] 图61是表示第一变形例所涉及的氯发生电极的结构例的侧视图。

[0079] 图62是表示第二变形例所涉及的氯发生电极的结构例的正视图。

[0080] 图63是表示第三变形例所涉及的氯发生电极的结构例的正视图。

[0081] 图64是表示第三变形例所涉及的氯发生电极的结构例的侧视图。

[0082] 图65是表示第四变形例所涉及的氯发生电极的结构例的正视图。

[0083] 图66是表示第四变形例所涉及的氯发生电极的结构例的侧视图。

[0084] 图67是表示图1所示的温水箱的具体例的外观立体图。

[0085] 图68是在图67所示的温水箱中拆下前部罩和上部罩后的状态的立体图。

[0086] 图69是在图67所示的温水箱中拆下配设于前表面的前部绝热材料后的状态的立体图。

[0087] 图70是从斜上方观察图67所示的温水箱的立体图。

[0088] 图71是放大表示图67所示的温水箱的下部的图。

[0089] 图72概念性地表示图67所示的温水箱的内部构造，(a)是温水箱的水位下降后的状态的图，(b)是温水箱的水位上升后的状态的图。

[0090] 图73是概念性地表示图1所示的制冰机的具体例的图。

[0091] 图74是图73所示的制冰机的截面侧视图。

[0092] 图75是表示图73所示的制冰机的冰块滑槽的立体图。

[0093] 图76是作为图1所示的杯输送机构的具体例的3轴式的杯输送机构的局部截面立体图。

[0094] 图77是杯把持装置的局部截面立体图。

[0095] 图78是表示杯把持装置的杯挡板的立体图。

[0096] 图79表示左侧的杯挡板，(a)是安装了配件的状态的立体图，(b)是拆下配件后的

状态的立体图。

[0097] 图80表示右侧的杯挡板，(a)是表示安装了配件的状态的立体图，(b)是拆下配件后的状态的立体图。

[0098] 图81是表示杯保持部被配置到杯供给机构的正下方的杯接收位置的状态的立体图。

[0099] 图82是表示作为图1所示的杯输送机构的具体例的悬挂式的杯输送机构的立体图。

[0100] 图83是表示探测从杯供给机构供给杯来输出杯探测信号的杯探测传感器的配设位置的图。

[0101] 图84是表示杯供给机构、杯把持装置、粉末原料供给机构、搅拌机构、取出口机构的立体图。

[0102] 图85是表示图1所示的搅拌机构的具体例的立体图。

[0103] 图86是变形例所涉及的搅拌机构的立体图。

[0104] 图87是变形例所涉及的搅拌机构的局部截面立体图。

[0105] 图88是表示应用了提取原料的粉碎装置的研磨机的立体图。

[0106] 图89是应用了提取原料的粉碎装置的研磨机的分解立体图。

[0107] 图90表示图88的研磨机，(a)是俯视图，(b)是侧视图。

[0108] 图91是表示研磨机的内部构造的截面侧视图。

[0109] 图92表示研磨机的不动研磨部，(a)是立体图，(b)是分解立体图。

[0110] 图93表示研磨机的旋转研磨部、通路壁环以及引导构件，(a)是立体图，(b)是从(a)省略通路壁环和引导构件而仅表示旋转研磨部的立体图。

[0111] 图94是分解表示图93的(a)的要素的立体图。

[0112] 图95是用于说明研磨机中的咖啡豆的粉碎动作的说明图。

[0113] 图96是表示带电序列的一例的图。

[0114] 图97是用于说明研磨机中的咖啡豆粉碎时的电荷的移动的说明图。

[0115] 图98是示意性地表示具备滤纸式的冲泡机构的杯式自动售货机的内部构造的图。

[0116] 图99是示意性地表示具备永久过滤器式的冲泡机构的杯式自动售货机的内部构造的图。

[0117] 图100表示纸冲泡机，(a)是从右上观察得到的立体图，(b)是从左上观察得到的立体图。

[0118] 图101表示网冲泡机，(a)是从右上观察得到的立体图、(b)是从左上观察得到的立体图。

[0119] 图102是从右上观察得到的纸冲泡机的分解立体图。

[0120] 图103是从左上观察得到的纸冲泡机的分解立体图。

[0121] 图104是表示将缸从缸架拆下的状态的滴漏单元的立体图。

[0122] 图105表示缸，(a)是俯视图，(b)是(a)中的c3-c3线剖视图。

[0123] 图106表示缸架，(a)是俯视图，(b)是正视图。

[0124] 图107表示省略了缸架的外侧罩后的滴漏单元，(a)是从前侧观察得到的立体图，(b)是从后侧观察得到的立体图。

[0125] 图108是表示省略了外侧罩的状态的缸架的右侧的侧壁的内部构造的侧视图。

[0126] 图109是表示显示了凸轮圆板的凸轮槽的状态的缸架的右侧的侧壁的内部构造的侧视图。

[0127] 图110是放大表示显示了凸轮槽的凸轮圆板的图。

[0128] 图111是图106所示的缸架的c4-c4线剖视图。

[0129] 图112是用于说明滴漏单元从主体驱动单元的拆下的说明图，是在操作拆卸杆前的状态下盖着罩的侧视图。

[0130] 图113是用于说明滴漏单元从主体驱动单元的拆下的说明图，是在操作拆卸杆前的状态下拆下罩的侧视图。

[0131] 图114是与图112同样的说明图，是在操作拆卸杆后的状态下盖着罩的侧视图。

[0132] 图115是与图113同样的说明图，是在操作拆卸杆后的状态下拆下罩的侧视图。

[0133] 图116表示纸冲泡机的主体驱动单元，(a)是立体图，(b)是拆下单元罩和导纸板的状态的立体图。

[0134] 图117表示网冲泡机的主体驱动单元，(a)是立体图，(b)是拆下刮刀的状态的立体图。

[0135] 图118是表示主体驱动单元的内部构造的左侧视图。

[0136] 图119是表示网冲泡机的主体驱动单元的内部构造的左侧视图。

[0137] 图120是表示主体驱动单元的内部构造的右侧视图。

[0138] 图121表示滤纸送出装置，(a)是从右上观察的立体图，(b)是从左上观察的立体图。

[0139] 图122表示纸架单元，(a)是封闭放纸门的状态的立体图，(b)是开放放纸门的状态的立体图。

[0140] 图123表示纸架单元，(a)是俯视图，(b)是(a)中的c5-c5线剖视图。

[0141] 图124表示纸架单元，(a)表示省略了左侧的侧壁的罩的状态的左侧视图，(b)是(a)中的c6-c6线剖视图。

[0142] 图125说明纸用尽检测杆，(a)是俯视图，(b)是左侧视图。

[0143] 图126表示滚筒驱动机构的锁定构造，(a)是用于说明锁定状态的图，(b)是用于说明锁定解除状态的图。

[0144] 图127表示纸驱动单元，(a)是从右上观察的立体图，(b)是从左上观察的立体图。

[0145] 图128表示纸架单元和纸驱动单元，(a)是使两个单元相离的状态的图，(b)是将两个单元连结的状态的图。

[0146] 图129是表示咖啡销售动作的执行处理的流程图。

[0147] 图130是表示图129所示的提取渣排出用初始处理的流程图。

[0148] 图131是表示图129所示的咖啡提取处理的流程图。

[0149] 图132是表示图131所示的大容量提取处理的流程图。

[0150] 图133是表示图129所示的提取渣排出处理的流程图。

[0151] 图134是用于依次说明咖啡销售时的纸冲泡机的动作的待机状态的说明图。

[0152] 图135是用于依次说明咖啡销售时的纸冲泡机的动作的向缸供给原料和热水的供给状态的说明图。

[0153] 图136是用于依次说明咖啡销售时的纸冲泡机的动作的向缸供给后热水的供给状态的说明图。

[0154] 图137是接着图136的说明图，表示缸盖前进、位于缸的正上方的状态。

[0155] 图138是接着图137的说明图，表示缸盖密封缸的上表面的状态。

[0156] 图139是接着图138的说明图，表示咖啡的运出结束后、解除了缸盖对缸的上表面的密封的状态。

[0157] 图140是接着图139的说明图，表示缸盖后退而返回到待机位置、第一次向开放的缸投入冲洗热水的投入状态。

[0158] 图141是接着图140的说明图，表示过滤块下降、第二次向缸投入冲洗热水的投入状态。

[0159] 图142是接着图141的说明图，表示通过送出滤纸来排出提取渣的状态。

[0160] 图143是用于说明在咖啡销售时选择咖啡的增量时的纸冲泡机的动作的图，表示第一次咖啡的运出结束后向缸供给追加热水的供给状态。

[0161] 图144是用于说明在咖啡销售时选择咖啡的增量时的纸冲泡机的动作的图，表示在追加热水的供给后缸盖密封缸的上表面的状态。

[0162] 图145是用于依次说明在咖啡销售时将提取渣排出到前方时的网冲泡机的动作的说明图，表示待机状态。

[0163] 图146是用于依次说明在咖啡销售时将提取渣排出到前方时的网冲泡机的动作的说明图，表示向缸供给原料和热水的供给状态。

[0164] 图147是用于依次说明在咖啡销售时中将提取渣排出到前方时的网冲泡机的动作的说明图，表示向缸供给后热水的供给状态。

[0165] 图148是接着图147的说明图，表示缸盖前进、位于缸的正上方的状态。

[0166] 图149是接着图148的说明图，表示缸盖密封缸的上表面的状态。

[0167] 图150是接着图149的说明图，表示在咖啡的运出结束后解除了缸盖对缸的上表面的密封的状态。

[0168] 图151是接着图150的说明图，表示缸盖后退而返回到待机位置、第一次向开放的缸投入冲洗热水的投入状态。

[0169] 图152是接着图151的说明图，表示过滤块下降、第二次向缸投入冲洗热水的投入状态。

[0170] 图153是接着图152的说明图，表示通过刮刀将提取渣排出到前方的状态。

[0171] 图154是接着图153的说明图，表示过滤块返回到待机位置的状态。

[0172] 图155是接着154的说明图，表示刮刀返回到待机位置的状态。

[0173] 图156是用于依次说明在咖啡销售时将提取渣排出到后方时的网冲泡机的动作的说明图，表示待机状态。

[0174] 图157是用于依次说明在咖啡销售时将提取渣排出到后方时的网冲泡机的动作的说明图，表示刮刀前进、位于前侧待机位置的状态。

[0175] 图158是用于依次说明在咖啡销售时将提取渣排出到后方时的网冲泡机的动作的说明图，表示向缸供给原料和热水的供给状态。

[0176] 图159是接着图158的说明图，是与图148对应的图。

[0177] 图160是接着图159的说明图，是与图149对应的图。

[0178] 图161是接着图160的说明图，是与图150对应的图。

[0179] 图162是接着图161的说明图，是与图151对应的图。

[0180] 图163是接着图162的说明图，是与图152对应的图。

[0181] 图164是接着图163的说明图，表示通过刮刀将提取渣排出到后方的状态。

[0182] 图165是表示冲泡机构的动作状态下的各夹紧件和凸轮圆板的旋转角度的关系的一览表。

[0183] 图166是表示从背面侧观察主体驱动单元的框架时的空气泵及其周围的图。

[0184] 图167表示吸气空间划分部，(a)是安装了封闭板的状态的立体图，(b)是拆下了封闭板的状态的立体图。

[0185] 图168表示滤网，(a)是立体图，(b)是分解立体图。

[0186] 图169是图168的(a)中的c7-c7线剖视图。

[0187] 图170表示过滤器主体的过滤孔(贯通孔)，(a)是上表面局部放大图，(b)是局部截面放大图，(c)是下表面局部放大图。

[0188] 图171是表示图170所示的过滤器主体的过滤孔(贯通孔)的局部放大剖视图。

[0189] 图172是表示变形例所涉及的过滤器主体的过滤孔(贯通孔)的局部放大剖视图。

[0190] 图173是搭载有搅拌碗的杯式自动售货机的内部正视图。

[0191] 图174是搅拌碗的截面侧视图。

[0192] 图175是图174中的c8-c8线剖视图。

[0193] 图176是表示图174所示的搅拌碗的盖主体的侧视图。

[0194] 图177是表示冲洗热水在图174的亲水化后的搅拌容器内表面的流动的图。

[0195] 图178是示出图174的搅拌容器的饮料附着量与饮料销售次数之间的关系的图。

[0196] 图179是示意性地表示图1所示的冷却单元的结构的图。

[0197] 图180是示意性地示出配置于冷却水槽内的各设备的结构的俯视图。

[0198] 图181是示意性地示出配置于冷却水槽内的各设备的结构的纵截面图。

[0199] 图182是示意性地表示作为本发明的实施方式的杯式自动售货机的糖浆供给机构的结构的图。

[0200] 图183是表示齿轮泵式的糖浆泵的结构例的立体图。

[0201] 图184是表示波纹管泵式的糖浆泵的结构例的立体图。

[0202] 图185是图184所示的糖浆泵的侧面剖视图。

[0203] 图186是表示图185所示的糖浆泵的喷出动作中的状态的侧面剖视图。

[0204] 图187是表示图186所示的糖浆泵的吸引动作中的状态的侧面剖视图。

[0205] 图188是待机位置开关的检测部的放大图。

[0206] 图189是示意性地表示图1所示的碳酸化器的结构的图。

[0207] 图190是示意性地表示碳酸化器的内部构造的正视图。

[0208] 图191是示意性地表示作为本发明的实施方式的杯式自动售货机的排水机构的结构的图。

[0209] 图192是表示排水开关的构造的立体图。

[0210] 图193是示意性地表示变形例所涉及的排水机构的结构的图。

[0211] 图194是取出口机构的立体图。

[0212] 图195是从背面观察的取出口机构的局部截面立体图。

[0213] 图196是从背面观察的取出口机构，是取出口门为开放状态的立体图。

[0214] 图197是取出口机构的截面正视图。

[0215] 图198是从背面观察的手动式的取出口机构的局部截面立体图。

[0216] 图199是中型的杯式自动售货机的内部正视图。

[0217] 图200是中型的杯式自动售货机的内部俯视图。

[0218] 图201是小型的杯式自动售货机的内部俯视图。

[0219] 图202是紧凑型的杯式自动售货机的内部正视图。

[0220] 图203是紧凑型的杯式自动售货机的内部俯视图。

[0221] 图204是超小型的杯式自动售货机的内部正视图。

[0222] 图205是超小型的杯式自动售货机的内部俯视图。

[0223] 附图标记说明

[0224] 1、1LA、1LB：杯式自动售货机；1-1：中型杯式自动售货机；1-2：小型杯式自动售货机；1-3：紧凑型杯式自动售货机；1-4：超小型杯式自动售货机；2：设备壳体；3：前表面门；4：取出口；5：门垫片；A：排水机构；A1：排水容器；A10：排水托盘；A11：排水通路；A2：排水开关；A3：排水盘；A4：电极开关；A5：安装台；A6：微动开关；A6a：检测片；A7：浮子；A8：线绳；A9：底面板；B：氯发生器；B10：氯发生器控制盒；B14：直流电源；B15：通电控制部；B18：氯发生电极；B18a：电极板；B19：氯发生电极；B19a：电极板；B20：氯发生电极；B21：电绝缘材料；B22：氯发生电极；B23：绝缘分隔壁；B4：氯发生电极；B4a：电极板；B4b：保持件；B4c：端子；C：杯供给机构；C-1：单种圆形杯供给机构；C-2：两种圆形杯供给机构；C-3：单种圆形+单种单列杯供给机构；C-4：单种方形杯供给机构；C10：基部；C11：载置面；C12：返回构件支承面；C13：返回构件；C13a：主体部；C13b：旋转轴部；C13c：按压凸部；C13d：弹簧安装部；C13e：扭转螺旋弹簧；C13f：止挡件；C14：连结孔；C15：杯列给送口；C16：环形凸部；C20：圆形杯收纳器；C20′：单列杯收纳器；C21：外壳；C21′：外壳；C21A：上外壳；C21B：下外壳；C21Ba：主体部；C21Bb：下环；C22：分隔板；C23：上环；C24：顶板；C25：上连结用具；C26：滚轮；C27：肋；C28：下连结用具；C28a：突出部；C28b：嵌合部；C30：落杯环；C30a、C30b：环外壳；C31：杯分离凸轮；C31a：凸轮部；C31b：齿轮部；C32：齿圈；C32a：齿轮部；C33：驱动杆；C34：上滑槽；C35：下滑槽；C36：杯售罄检测杆；C37：杯售罄检测开关；C38：杯落下探测传感器；C38a：发光元件；C38b：受光元件；C40：驱动装置；C41：电动机；C42：齿轮箱；C43：输出轴；C44：驱动齿轮；C45：旋转体；C45a：卡合突起；C46：收纳器旋转构件；C46a：齿轮部；C46b：嵌合部；C47：滑动件；C47a：长孔；C47b：连结部；C50：基部；C51：载置面；C52：杯列给送口；C60：方形杯收纳器；C61：外壁；C61a：背壁部；C61b：侧壁部；C62：上部罩；C63：前表面罩；C64：止挡棒；C70：驱动装置；C71：电动机；C710：旋转驱动部；C711：驱动体；C711a：偏心凸轮；C712：旋转板；C713：支轴；C720：滑动机构部；C721A：上层板；C721B：中层板；C721C：下层板；C722：右滑动件；C722a：贯穿部；C723：左滑动件；C723a：齿条；C724：驱动杆；C725：长孔；C726：施力机构；C727：水平棒；C728：滑动件；C728a：贯穿部；C729：盘簧；C730：小齿轮；C730a：槽；C731：弹簧；C732：弹簧；C733：小齿轮；C733a：槽；C74：齿轮箱；C80：杯列补充装置；C81：推棒；C81a：主体部；C81b：上连接部；C81c：下连接部；C81d：弯折部；C82：底部引导件；C82a：引导件壁

部;C82b:卡合凸部;C82c:退让槽;C82d:孔;C83:支撑棒;C83a:主体部;C83b:上连接部;C83c:下连接部;C83d:弯折部;C84:轴承;CK:销售货道;CY:预备货道;D:原料供给机构;D-1:粉末原料供给机构;D-2:提取原料供给机构;D10:罐;D11:容器主体;D11a:投入口;D11b:导轨部;D12:料斗;D13:送出部;D13a:喷出口;D13b:滑动孔;D14:盖体;D15:卡定机构;D15a:滑动构件;D15b:滑动引导件;D15c:突起;D16:指示器;D17:原料检测传感器;D17a:发光元件;D17b:受光元件;D18:轮;D19:螺旋钻螺杆;D19a:突条;D20:滑槽;D21:放出口;D22:闸门;D22a:支承轴部;D23:闸门开放杆;D23a:后端部;D24:拉伸弹簧;D30:齿轮箱;D31:螺杆电动机;D40:罩构件;D41:第一加热器;D42:第二加热器;D43:护套;D44:电热丝;D45:发热基准面;D46、D47:加热器;D48:加热器;D50:闸门开闭装置;D51:外壳;D51a:滑动板;D52:闸门开闭杆;D52a:支承轴;D52b:旋转孔;D52c:杆销;D52d:前端部;D52e:按压突起部;D53:选择杆;D53a:杆部;D53b:凸轮抵接部;D53c:槽部;D54:凸轮装置;D54a:凸轮部;D54b:齿轮部;D54c:齿轮缺口部;D54d:凸轮止挡部;D54e:旋转轴;D54f:旋转孔;D54g:凹部;D55:驱动齿轮;D55a:销;D56:拉伸弹簧;D57:片簧;D58:驱动电动机;D58a:旋转轴;E:储液器;E1:水泵;E11:储液器主体;E12:盖体;E12a:供水口;E12b:滑动部;E13:检测棒;E13a:凸缘;E13b:浮子;E14:浮子开关;E14a:高水位开关;E14b:低水位开关;E16:棒罩;E16a、E16b:插入孔;E17:棒罩;E17a、E17b:插入部;E18:检测棒;E18a:凸缘;E18b:突片;E2:滤水器;E20:棒位置保持轴(螺纹);E3、E4:电磁供水阀;E30:辅助泵;E31:辅助供水管;E32:供水箱;E40:供水线路;E41:水冷却盘管;E42:电磁冷水阀;E43:碳酸水供给线路;E44:电磁供水阀;E45:电磁碳酸水阀;E46:融水管;E5:供水管;F:温水箱;F1:加热器;F10:热水喷出单元;F11、F:12热水供给阀;F11a、F12a:热水供给管;F13:喷出温度传感器;F14:溢流管;F2:浮子;F20:下部温度传感器;F3:感测臂;F30:沸腾防止热电偶;F31:高水位开关;F32:低水位开关;F34:干烧防止热电偶;F35:内部绝热材料;F36:外部绝热材料;F37:真空绝热材料;F38:下部绝热材料;F39:喷出口;F4:支承轴;F40:前部罩;F5:热水供给口;F50:上部罩;F6:前部绝热材料;F60:清洗用具;F61:喷嘴;F62:操作杆;G:制冰机;G1:冰供给通路;G10:制冰部;G11:制冰筒;G12:螺旋钻;G12a:切削刀;G13:制冷剂通路;G14:减速机;G15:驱动电动机;G16:固定刀;G20:储冰部;G21:储冰室;G21a:放出口;G22:连络筒;G23:旋转轴;G24:搅拌器;G25:分隔构件;G25a:连络孔;G26:探测板;G27:储冰量探测开关;G28:开闭门;G29:门螺线管;G29a:复位弹簧;G30:冰块滑槽;G31:冰定量传感器;H:杯输送机构;H-1:3轴式的杯输送机构;H-2:悬挂式的杯输送机构;H10:XY台;H12:杯把持装置;H14:X轴部;H16:Y轴部;H160:外壳;H18:X轴罩;H181:台;H182L:杯挡板;H182L1:轴部;H182L2:齿轮部;H182L3:挡板臂部;H182L3a:方孔;H182L4:杯把持部;H182L5:挡板部;H182L6:臂部;H182L7、H182R7:肋;H182R:杯挡板;H182R1:轴部;H182R2:齿轮部;H182R3:挡板臂部;H182R3a:方孔;H182R3b:方孔;H182R4:杯把持部;H182R5:挡板部;H182R6:臂部;H183:引导片;H184:Z轴驱动电动机;H185:Z轴原点开关;H186:Z轴位置检测开关;H187:Z轴引导件;H188:H轴驱动臂;H189:弹簧;H190:配件;H190a:爪部;H190b:凸部;H2:Y轴部;H20:X轴输送电动机;H201:杯把持装置;H202:轨道;H203:杯输送电动机;H204:粉末托盘;H204a:杯废弃洞;H204b:洞缘;H205:废弃杯容器;H206:杯探测传感器;H206a:发光元件;H206b:受光元件;H208:盛渣容器;H22:X轴电动机驱动器;H24:X轴驱动带轮;H25:X轴从动带轮;H26:X轴同步带;H28:X轴调整螺纹;H30:X轴原点传感器;H32:防脱板;H34:Y轴罩;H36:Y轴输送电动机;H38:Y轴电动机驱动

器;H40:Y轴驱动带轮;H41:Y轴从动带轮;H42:Y轴同步带;H44:Y轴调整螺纹;H46:Y轴原点传感器;H48:防脱板;H50:Y轴锁定螺线管;J:搅拌机构;J-1、J-2:搅拌机构;J10:搅拌桨;J10a:驱动轴;J11:搅拌桨旋转电动机;J12:搅拌桨升降电动机;J13:待机高度检测开关;J14:搅拌高度检测传感器;J15:搅拌桨上下引导件;J16:热水喷嘴;J17:咖啡供给喷嘴;J18:叶茶供给喷嘴;J19:罩;J20:冰块导入滑槽;K:研磨机;K1:外壳;K10:粒度调整螺纹;K10a:蜗轮;K11:料斗;K12:粗碎环;K13:上侧细碎环;K13a、K25a:粉碎面;K14:齿轮部;K15:外螺纹部;K18:粉碎凸部;K18a:上表面;K18b:前端面;K18c:凹部;K19:凹部;K19a:三角面;K19b:圆弧面;K2:研磨机主体部;K21:原料送料器;K21a:旋转部;K21b:螺旋凸部;K21c:螺母;K22:旋转轴;K22a:轴承;K23:研磨机齿轮;K24:粉原料收集/喷出板;K24a:叶片部;K25:下侧细碎环;K26:粉送出通路;K27:通路壁环;K27a:喷出口;K27b:弹簧卡定部;K28:引导构件;K28a:内表面;K29:连接弹簧;K3:电动机;K30:地线;K30a:端子;K31:驱动齿轮;K32:中间齿轮;K36:滑槽;K3a:外壳;K3b:连接部;K4:粉原料供给部;K4a:圆筒部;K6:不动研磨部;K7:旋转研磨部;L:冲泡机构;L1:冲泡机;L101:缸盖;L102:刮刀;L102a:支撑件;L102b:刮刀主体;L102c:卡合槽;L102d:缺口;L103:框架;L103a:上部开口;L103b:中央部开口;L104:凸轮驱动机构;L105:缸盖/刮刀驱动机构;L106:夹紧驱动机构;L107:空气泵;L107a:空气吸引口;L108:单元罩;L109:导纸板;L109a:倾斜部;L109b:弯曲部;L111:盖主体;L112:滑动件;L113:盖引导棒;L114:原料/热水引导构件;L115:辅助原料滑槽;L116:热水引导接受部;L116a:辅助热水供给喷嘴;L121:第一电动机;L122:齿轮箱;L123:输出齿轮;L124:驱动接合齿轮;L125:模式开关;L125a:开关齿轮;L126:中间齿轮;L131:第二电动机;L132:齿轮箱;L133:刮刀驱动部;L133a:臂;L133b:卡合凸部;L140:接合软管;L141:管保持件;L142:夹紧主体;L143:凸轮;L144:输出齿轮;L145:旋转轴;L146:驱动齿轮;L16:饮料管;L20:冲泡机主体;L201:滤纸送出装置;L202:纸架单元;L203:纸驱动单元;L204:架主体;L204a:引导辊;L205:进纸滚筒;L205a:圆弧部;L205b:直线部;L205c:小圆弧部;L206:放纸门;L207:纸用尽检测杆;L207a:支轴;L207b:杆主体;L207c:检测杆部;L208:滚筒驱动机构;L21:滴漏单元;L211:框架;L212:薄膜罩;L213:侧壁;L213a:开口;L213b:卡合孔;L213c:卡定部;L215:罩;L216:纸卷部支承构件;L216a:凸部;L216b:腿部;L216c:倾斜面;L217:防脱构件;L218:滚筒轴;L22:主体驱动单元;L221:门主体;L222:臂;L222a:卡合凸部;L222b:锁定部;L223:辊轴;L224:辊;L225:渣分离板;L226:弹簧;L228:扭转弹簧;L23:缸;L231:前带轮;L232:后带轮;L233:同步带;L234:支轴;L235:从动齿轮;L235a:毂部;L235b:卡合凹部;L236:齿轮锁定机构;L237:锁定构件;L237a:环部;L237b:滑动部;L238:弹簧;L239:锁定凸部;L24:缸架;L241:外壳;L241a:锁定构件抵接部;L242:电动机;L243:齿轮箱;L243a:输出轴;L244:驱动齿轮;L245:凸轮;L245a:卡合凹部;L246:进纸检测开关;L246a:操作杆;L246b:开关辊;L247:纸用尽检测开关;L247a:操作杆;L247b:开关辊;L248:切换杆;L248a:支点;L248b:卡合部;L249:扭转弹簧;L24a:缸收容部;L25:把手;L26:引导部;L27:热水引导壁;L28:热水扩散凸部;L301:吸气空间划分部;L302:空气吸引管;L303:肋;L303a:凸部;L303b:螺纹孔;L304:吸气空间;L305:开口部;L311:封闭板;L312:管安装孔;L313:螺丝;L314:螺丝插入孔;L315:缺口;L32:过滤块;L32a:过滤块管;L34:接缸器;L35:前表面罩;L36:前上罩;L37:架罩;L37a:原料投入口;L37b:热水供给口;L37c:热气排出口;L38、L39:引导辊;L40:接合软管;L41:侧壁;L41a:凹部;L41b:支承孔;L42:背壁;L43:

底壁;L44:侧壁主体;L44a、L44b:支轴;L44c:长孔;L44d:支轴;L44e:导轨;L44f:支承部;L45:外罩;L45a:长孔;L45b:卡合凸部;L50:废液管;L50a:水平部;L51:缸开闭机构;L53:第一凸轮槽;L54:第二凸轮槽;L55:凸轮圆板;L55a:齿轮部;L55b:凸部;L56:滑动件;L56a:卡合凸部;L56b:长孔;L57:缸盖锁定构件;L57a:卡合凸部;L57b:锁定部;L58:废液管夹紧构件;L58a:卡合凸部;L58b:按压部;L59:压紧弹簧;L61:外侧凸轮部;L61a:接近部;L62:驱动凸轮部;L63:内侧凸轮部;L64:外侧凸轮部;L65:驱动凸轮部;L66:内侧凸轮部;L71:连结轴;L72:滤网;L721:过滤器主体;L721a:网部;L721b:凸缘部;L721c:过滤孔;L721d:浅凹;L721e:直孔;L721f:下表面;L721g:曲面锥构造;L721h:刀口;L722:保持板;L722a:支承部;L722b:孔;L722c:固定部;L723:固定框;L723a:侧壁;L723b:上壁;L73:密封件;L74:支承构件;L75:动力传递轴;L76:齿轮;L76a:从动接合齿轮;L8:夹紧件;L84:拆卸杆;L84a:操作部;L84b:拆卸凸部;L85:锁定部;L88:支承突起;L89:凸轮锁定机构;L89a:锁定构件;L89b:弹簧;L8A:第一空气夹紧件;L8B:第二空气夹紧件;L8C:饮料夹紧件;L9:输送管;L90:锁定解除凸部;L91:支承构件;L91a:基部;L91b:臂部;L92:把持构件;L9A:第一空气输送管;L9B:第二空气输送管;L9C:饮料输送管;LA:纸冲泡机;LB:网冲泡机;LG:提取渣;LP:滤纸;LPr:纸卷部;LPs:芯部;M:搅拌碗;M100:库内灯;M11:搅拌容器;M11a:内表面;M12:盖主体;M13:热水导入口;M13a:热水通路;M14:热水流下槽;M15:周壁;M15a:突起;M16:间隙;M17:原料投入口;M18:排气通路;M19:饮料注出部;M19a:喷出口;M20:搅拌装置;M21:搅拌电动机;M22:接头;M23:铅直轴;M24:烹调用搅拌叶片;M25:阀叶片;N:冷却单元;N1:冷却水槽;N11:电磁阀;N12:毛细管;N13:合流部;N14:电磁阀;N15:膨胀阀;N17:风扇;N18:单元基部;N19:空气过滤器;N1a:内表面;N2:压缩机;N21:糖浆冷却盘管;N22:搅拌装置;N22a:搅拌构件;N22b:电动机;N23:送水引导件;N24:控制传感器;N3、N4:装卸机构部;N5:冷凝器;N6:蒸发器;N8:干燥器;N9、N10:制冷剂配管;P:糖浆供给机构;P1～P3:糖浆泵;P10、P11:糖浆阀;P12:电动机;P13、P14:齿轮;P15:泵主体;P16:活塞;P17:波纹管;P18:主体;P19:缸;P20:吸入口;P20a:止回阀;P21:喷出口;P21a:止回阀;P23:棒;P26:齿轮电动机;P27:凸轮;P27a:凹部;P28:驱动销;P29:第一连杆臂;P30:轴销;P31:第二连杆臂;P32、P33:连结销;P35:待机位置开关;P35a:检测部;P35b:弹性片;P36:开关抵接构件;P38:电动机旋转传感器;P39:固定螺纹;P4～P6:糖浆供给线路;P7～P9:盒中袋;Q:碳酸化器;Q1:密闭容器;Q1:碳酸水导出管;Q12:接收盘;Q14:浮子开关;Q2:碳酸气瓶;Q3:供水接头;Q4:供气接头;Q5:碳酸水喷出接头;Q7:水喷射喷嘴;Q9:气体配管;R:控制部;S:取出口机构;S-1:自动式的取出口机构;S-2:手动式的取出口机构;S10:取出口门;S10a:卡合片;S12:正面框体;S14:保持架;S14a:底面;S16:取出口门开闭电动机;S18:阻尼器;S20:取出口门锁定螺线管;S22:取出口门关闭探测开关;S24a、S24b:取出口杯探测传感器;S26:取出口照明;S28:加强肋;S30:突出片;T100:库内灯;T106:水坝开关;T110:排气风扇;T116:铰链;T118:电源盒;T119:盛渣容器;T120:铰链;T122:电源继电器盒;T126:冷却单元过滤器;T128:排水容器开关;T130:滤水器;U:操作单元;U1:操作输入部;V:收款处理装置;V1:金额显示器;V2:硬币投入口;V3:硬币退还杆;V4:纸币插入口;V5:硬币退还口;W、W1、W2:杯;WK:销售杯列;WY:预备杯列。

具体实施方式

[0225] 下面,参照附图来详细说明本发明所涉及的杯式自动售货机的优选实施方式。

[0226] <杯式自动售货机1的概要>

[0227] 图1～图3表示杯式自动售货机1的概要。杯式自动售货机1构成为：在设备壳体2的内部具备控制部R、杯供给机构C、原料供给机构D、储液器E、氯发生器B、温水箱F、制冰机G、杯输送机构H、搅拌机构J、研磨机K、冲泡机构L、搅拌碗M、冷却单元N、糖浆供给机构P、碳酸化器Q、排水机构A，并且在杯式自动售货机1的前表面门3具备取出口机构S、操作单元U、收款处理装置V。取出口机构S设置于取出口4，是用于开闭取出口4的机构，该取出口4设置于前表面门的中央部。在该杯式自动售货机1中，当通过收款处理装置V确认出利用现金、预付卡的收款、且通过操作单元U进行了饮料的选择时，根据来自控制部R的指令，上述的各个机构相关联地进行动作，将期望的饮料以装入杯W的状态进行提供。能够通过前表面门3的取出口机构S将所提供的饮料取出到机外。

[0228] 如图2和图3所示，在前表面门3的上部的容易看到且易于操作的位置设置有操作单元U。在操作单元U中，显示所提供的饮料的名称、图像等，并且设置有对应的操作输入部U1。作为操作输入部U1，能够使用触摸面板、按钮开关。在前表面门3的大致中央部的易于操作的位置设置有取出口机构S。取出口机构S是用于将装入了饮料的杯W取出到机外的部分。在与取出口机构S相邻的部位设置有收款处理装置V。收款处理装置V是金额显示器V1、硬币投入口V2、硬币退还杆V3、纸币插入口V4、硬币退还口V5等用于与使用者之间进行钱款的授受的部分。

[0229] 在前表面门3的后表面周缘部，遍及整周地设置有门垫片5。在关闭了门的情况下门垫片5适当弹性变形，由此与设备壳体2压力接触，来成为将门体与设备壳体2之间的间隙密封的状态，因此能够防止昆虫、尘埃等异物进入到设备壳体2的内部。

[0230] 下面，依次详述构成杯式自动售货机1的各个机构部。

[0231] <杯供给机构C>

[0232] 杯供给机构C用于在设备壳体2的内部收纳多个杯W，另一方面，在每次销售饮料时向杯输送机构H单个地供给杯W。杯W以成为杯列的状态被收纳，该杯列是大量杯W以开口朝上的状态堆叠而成的。作为杯式自动售货机1的杯供给机构C，如图4的(a)～图4的(d)所示，存在单种圆形杯供给机构C-1、两种圆形杯供给机构C-2、单种圆形+单种单列杯供给机构C-3、单种方形杯供给机构C-4等根据所收纳的杯列的数量、杯W的种类而杯收纳部的数量不同的杯供给机构。此外，作为供给对象的杯W是具有圆形的横截面的一般的纸制杯，以随着去向下方而外形变小的方式形成为锥状，在上端部的开口周缘部具有卷曲部。

[0233] <单种圆形杯供给机构C-1>

[0234] 单种圆形杯供给机构C-1用于收纳1个种类的大量的杯W来进行供给，如图5～图7所示，具备基部C10、圆形杯收纳器C20、落杯环C30、驱动装置C40(参照图10)、杯供给控制部(未图示)等。其中，圆形杯收纳器C20沿圆周收纳多个杯列。下面，为了方便起见，设将收纳于圆形杯收纳器C20的杯列中的收纳于可供给位置的杯列称为“销售杯列WK”，将其它杯列称为“预备杯列WY”。

[0235] 基部C10由合成树脂制的成形品构成，具有块状的外观，并且形成为中空状，下表面敞开。如图6所示，基部C10在其上部具有载置面C11和返回构件支承面C12。载置面C11构成为比圆形杯收纳器C20的横截面大一圈，用于载置圆形杯收纳器C20，并且载置收纳于该圆形杯收纳器C20的内部的预备杯列WY。返回构件支承面C12设置于载置面C11的外缘附近

的规定位置，用于将后述的返回构件C13以旋转自如的方式支承。

[0236] 在载置面C11的中央，形成有沿上下方向贯通的、用于将圆形杯收纳器C20与驱动装置C40连结的连结孔C14。另外，在载置面C11的规定位置，形成有沿上下方向贯通的杯列给送口C15。杯列给送口C15用于将销售杯列WK送出到下方的落杯环C30，具有比杯W的最大直径大一圈的直径。并且，在载置面C11形成有多个(在图示的例子中为3个)环形凸部C16，该多个环形凸部C16向上方突出少许，配置成同心圆状。这些环形凸部C16用于使载置面C11与配置于预备杯列WY的最下层的杯W之间的接触面积减少，由此降低摩擦阻力，使得在载置面C11上顺畅地输送预备杯列WY。

[0237] 返回构件C13构成为能够与圆形杯收纳器C20卡合或从圆形杯收纳器C20脱离，具有主体部C13a、旋转轴部C13b、按压凸部C13c。主体部C13a由合成树脂制的成形品构成，呈规定形状的块状。旋转轴部C13b从主体部C13a向下方延伸，被有余裕地插入到以从返回构件支承面C12向下方延伸的方式形成的孔(未图示)。按压凸部C13c从主体部C13a向圆形杯收纳器C20侧突出。在主体部C13a载置于返回构件支承面C12上的状态下，该返回构件C13能够以旋转轴部C13b为中心进行旋转。另外，在主体部C13a的上表面，在与旋转轴部C13b相同的轴线上设置有向上方突出的弹簧安装部C13d。在该弹簧安装部C13d处，安装有以使返回构件C13沿逆时针方向旋转的方式施力的扭转螺旋弹簧C13e。

[0238] 另外，在基部C10的载置面C11，在返回构件C13附近的部位设置有止挡件C13f。止挡件C13f在返回构件C13位于图5～图7所示的待机位置时与返回构件C13抵接，用于阻止返回构件C13进一步沿逆时针方向的旋转。

[0239] 圆形杯收纳器C20具备沿上下方向延伸的圆筒状的外壳C21以及在该外壳C21的内部沿上下方向延伸、并且配置为以外壳C21的中心轴线为中心呈放射状的多个(在图示的例子中为5个)分隔板C22。

[0240] 外壳C21具有上外壳C21A和下外壳C21B，配置为下外壳C21B的上端部嵌到上外壳C21A的下端部的外侧的状态。在上外壳C21A的上端部设置有俯视时呈环状的上环C23，在该上环C23的上表面安装有顶板C24。在顶板C24的中央部安装有将所有分隔板C22的上端部的内侧部分连结的上连结用具C25。另外，所有分隔板C22的上端部的外侧部分固定于上环C23的内周面。

[0241] 下外壳C21B具有圆筒状的主体部C21Ba以及设置于主体部C21Ba的下侧的、俯视时呈环状的下环C21Bb。主体部C21Ba位于下环C21Bb的上方，构成为能够向上方滑动。因而，在向圆形杯收纳器C20补充杯列时，能够通过使下外壳C21B的主体部C21Ba向上方滑动来在圆形杯收纳器C20的下半部敞开的状态下进行补充。

[0242] 如图6所示，在下环C21Bb，在外周面侧的规定位置以旋转自如的方式设置有多个(在图示的例子中为3个)滚轮C26。这些滚轮C26相比于下环C21Bb的下端而言向下方突出少许。因而，通过这些滚轮C26在基部C10的载置面C11上滚动，圆形杯收纳器C20能够顺畅地旋转。另外，如图6和图7的(b)所示，在下环C21Bb的外周面，在规定位置设置有多个(在图示的例子中为5个)肋C27。肋C27向外侧突出，且沿上下方向延伸规定长度，能够与返回构件C13的按压凸部C13c卡合或从返回构件C13的按压凸部C13c脱离。这些肋C27设置于与多个分隔板C22分别对应的规定位置。并且，所有分隔板C22借助下端部的外侧部分固定于下环C21Bb的内周面。

[0243] 如前所述，多个分隔板C22在外壳C21内配置为放射状。如图7的(b)所示，各分隔板C22形成为在径向的中央部向逆时针方向弯折。通过这些分隔板C22，在外壳C21的内部划分出用于收纳杯列的多个杯列收纳部。具体地说，在与基部C10的杯列给送口C15相对的部位，划分出用于收纳销售杯列WK的销售货道CK。在与基部C10的载置面C11相对的部位，划分出4个用于收纳预备杯列WY的预备货道CY。

[0244] 另外，如图6所示，所有分隔板C22的下端部的内侧部分通过规定形状的下连结用具C28被连结。在该下连结用具C28的下部，设置有向下方延伸规定长度的突出部C28a，在该突出部C28a的上部形成有规定形状的嵌合部C28b。这些突出部C28a和嵌合部C28b均被有余裕地插入到基部C10的连结孔C14，以插入到位于连结孔C14的下方的后述的收纳器旋转构件C46的状态与连结孔C14嵌合。

[0245] 落杯环C30设置于基部C10的下部，从销售杯列WK将最下层的杯W分离。该落杯环C30具备形成为俯视时呈环状的上下的环外壳C30a、C30b，配置成位于杯列给送口C15的正下方。在落杯环C30的内周缘部，多个(在图示的例子中为6个)杯分离凸轮C31设置为以铅直轴线为中心旋转自如。如图8和图9所示，杯分离凸轮C31在各自的周面具有螺旋状的凸轮部C31a，并且在下端部具有齿轮部C31b，杯分离凸轮C31配设成面对落杯环C30的内侧。

[0246] 在落杯环C30的内部，在成为各个杯分离凸轮C31的外周的部位，以旋转自如的方式设置有齿圈C32。齿圈C32形成为俯视时呈环状，在内周部具有齿轮部C32a，借助齿轮部C32a来与杯分离凸轮C31的齿轮部C31b分别啮合。虽然图中未明示，但是与齿圈C32的齿轮部C32a啮合的杯分离凸轮C31配置成相对于杯列给送口C15的中心轴线而言各个凸轮部C31a为相同朝向。在该齿圈C32，在外周部以向落杯环C30的外侧突出的方式设置有驱动杆C33。

[0247] 如图10所示，在落杯环C30设置有上滑槽C34和下滑槽C35。上滑槽C34用于将被插入到杯列给送口C15的销售杯列WK引导至落杯环C30，上滑槽C34呈与杯列给送口C15连通的圆筒状。下滑槽C35用于将被落杯环C30从销售杯列WK分离的杯W引导至下方，下滑槽C35构成为圆筒状。

[0248] 在上滑槽C34的上部设置有杯售罄检测杆C36和杯售罄检测开关C37，在下滑槽C35的下部设置有杯落下探测传感器C38。杯售罄检测杆C36从上滑槽C34的外部以去向内侧而向前下倾斜的状态突出，借助上端部来以旋转自如的方式被支承。虽然图中未明示，但是该杯售罄检测杆C36被设置成：在收纳于销售货道CK的杯W的数量变为规定数量(例如5个)以下的情况和收纳于销售货道CK的杯W的数量多于规定数量的情况之间，该杯售罄检测杆C36的倾斜角度不同。杯售罄检测开关C37对未图示的杯供给控制部输出与杯售罄检测杆C36的倾斜角度相应的信号。杯落下探测传感器C38在杯W通过下滑槽C35的内部的情况下将其检测信号输出到杯供给控制部(未图示)。作为杯落下探测传感器C38，通过在下滑槽C35的下端部的彼此相向的部位设置发光元件C38a和受光元件C38b来构成该杯落下探测传感器C38。即，以如下方式构成杯落下探测传感器C38：在从发光元件C38a向受光元件C38b照射的光被遮挡的情况下，将其检测信号输出到杯供给控制部(未图示)。

[0249] 驱动装置C40用于驱动圆形杯收纳器C20和落杯环C30，驱动装置C40在基部C10的内部具备电动机C41、齿轮箱C42、输出轴C43、驱动齿轮C44、旋转体C45。电动机C41能够根据来自杯供给控制部(未图示)的指令来沿正向和反向旋转。齿轮箱C42内置有减速齿轮系，与

电动机C41连结。输出轴C43沿上下方向延伸，从齿轮箱C42的上下突出。驱动齿轮C44用于对圆形杯收纳器C20进行旋转驱动，与输出轴C43的上端部连结。该驱动齿轮C44经由未图示的规定的第一单向离合器来与输出轴C43连结。例如仅在电动机C41沿正向旋转、由此输出轴C43沿顺时针方向旋转时，第一单向离合器使驱动齿轮C44与输出轴C43一体地沿顺时针方向旋转。即，在电动机C41沿反向旋转、由此输出轴C43沿逆时针方向旋转的情况下，第一单向离合器不将输出轴C43的旋转传递到驱动齿轮C44。因而，在输出轴C43沿逆时针方向旋转的情况下，驱动齿轮C44不旋转。另外，驱动齿轮C44与连结于圆形杯收纳器C20的收纳器旋转构件C46的齿轮部C46a啮合。

[0250] 收纳器旋转构件C46以铅直轴线为中心旋转自如地支承于基部C10的内部，具有上述的齿轮部C46a以及以规定形状形成于齿轮部C46a的上部的嵌合部C46b。在圆形杯收纳器C20被载置于基部C10上的状态下，设置于圆形杯收纳器C20的下连结用具C28的嵌合部C28b与收纳器旋转构件C46的嵌合部C46b以相互嵌合的状态连结。因而，收纳器旋转构件C46与圆形杯收纳器C20一体地旋转。当通过沿顺时针方向旋转的驱动齿轮C44来对收纳器旋转构件C46沿逆时针方向进行旋转驱动时，随之圆形杯收纳器C20也沿逆时针方向旋转。

[0251] 旋转体C45用于驱动落杯环C30，与输出轴C43的下端部连结。该旋转体C45形成为俯视时呈具有规定的直径的圆板状，其中心部经由未图示的规定的第二单向离合器来与输出轴C43连结。例如仅在电动机C41沿反向旋转、由此输出轴C43沿逆时针方向旋转时，第二单向离合器使旋转体C45与输出轴C43一体地沿逆时针方向旋转。即，在电动机C41沿正向旋转、由此输出轴C43沿顺时针方向旋转的情况下，第二单向离合器不将输出轴C43的旋转传递到旋转体C45。因而，在输出轴C43沿顺时针方向旋转的情况下，旋转体C45不旋转。

[0252] 在旋转体C45的底面，在外缘附近设置有向下方突出的卡合突起C45a。在旋转体C45的下侧，在落杯环C30的外缘附近设置有沿规定方向且水平地滑动自如的滑动件C47。在该滑动件C47形成有长孔C47a。旋转体C45的卡合突起C45a滑动自如地与滑动件C47的长孔C47a卡合。另外，在滑动件C47设置有连结部C47b。连结部C47b从滑动件C47向下方延伸，与在落杯环C30的齿圈C32处设置的驱动杆C33连结。

[0253] 在该驱动装置C40中，通过旋转体C45旋转1圈，滑动件C47以在落杯环C30的外周方向上往复移动的方式滑动。当滑动件C47往复移动时，齿圈C32往复旋转，随之多个杯分离凸轮C31同步地在规定角度的范围内往复旋转。由此，如图11所示，配置于销售杯列WK的最下层的杯W1被分离。即，如图11的(a)所示，配置于销售杯列WK的最下层的杯W1的上端的卷曲部被载置于杯分离凸轮C31的上端，由此销售杯列WK的杯W不会向下方落下而收纳于圆形杯收纳器C20的销售货道CK。当从该状态起杯分离凸轮C31旋转时，如图11的(b)和图11的(c)所示，通过形成为螺旋状的凸轮部C31a的作用，最下层的杯W1被向下方压下而从销售杯列WK分离，从杯列给送口C15落下到下方。与此同时，堆叠在最下层的上一层的杯W2的卷曲部与杯分离凸轮C31抵接，再次成为图11的(a)的状态。此后，重复执行上述的动作，使堆叠于销售杯列WK的杯W逐个落下到下方。

[0254] 下面，参照图12～图14来说明上述的单种圆形杯供给机构C-1的动作。图12的(a)示出以下状态：在圆形杯收纳器C20的销售货道CK中收纳有销售杯列WK，并且在4个预备货道CY中分别收纳有预备杯列WY。销售货道CK的销售杯列WK处于贯通杯列给送口C15来插入到落杯环C30的内侧的状态。预备货道CY的预备杯列WY分别处于借助最下层的杯W来载置于

载置面C11的状态。

[0255] 当从该状态起例如通过由使用者按下选择按钮来对杯式自动售货机1的控制部R提供销售指令时，从控制部R对杯供给控制部(未图示)提供杯供给指令。当对杯供给控制部(未图示)提供了杯供给指令时，驱动装置C40的电动机C41沿反向旋转，旋转体C45旋转1圈，由此落杯环C30被驱动。由此，从销售杯列WK分离出最下层的杯W1来经由下滑槽C35供给到下方。此时，虽然由于电动机C41的反向的旋转而驱动装置C40的输出轴C43沿逆时针方向旋转，但是动力传递被第一单向离合器取消，驱动齿轮C44不会旋转。因而，与驱动齿轮C44啮合的收纳器旋转构件C46不会旋转，经由下连结用具C28连结的圆形杯收纳器C20也不会旋转。

[0256] 由杯落下探测传感器C38来检测从销售杯列WK分离的杯W是否通过了下滑槽C35的下端。在由杯落下探测传感器C38确认出杯W的通过的情况下，判断为正常地进行了杯W的供给，等待接收下一个杯供给指令。与此相对，在产生杯W中途堵塞等异常而杯落下探测传感器C38未确认出杯W的通过的情况下，例如通过杯供给控制部(未图示)来通知产生了异常，饮料的销售中止。

[0257] 当销售杯列WK的杯W减少、从而如图12的(b)所示那样销售杯列WK中不再存在比基部C10的杯列给送口C15靠上侧的杯W时，由杯售罄检测开关C37检测出该情况，将其检测信号提供到杯供给控制部(未图示)。当从杯售罄检测开关C37提供了检测信号时，根据来自杯供给控制部(未图示)的指令，驱动装置C40的电动机C41沿正向旋转，对圆形杯收纳器C20沿逆时针方向进行旋转驱动。此时，虽然由于电动机C41的正向的旋转而驱动装置C40的输出轴C43沿顺时针方向旋转，但是动力传递被第二单向离合器取消，旋转体C45不会旋转。因而，也不会由落杯环C30对销售杯列WK的杯W进行分离。

[0258] 图12的(c)示出了圆形杯收纳器C20开始沿逆时针方向旋转的状态。当圆形杯收纳器C20旋转时，原本位于返回构件C13的按压凸部C13c的附近的肋C27与按压凸部C13c卡合来进行按压。由此，返回构件C13抵抗扭转螺旋弹簧C13e的施力来沿顺时针方向旋转。

[0259] 当从该状态起圆形杯收纳器C20进一步沿逆时针方向旋转时，如图13的(a)所示，原本与返回构件C13的按压凸部C13c卡合的肋C27从该按压凸部C13c脱离，卡合被解除。由此，返回构件C13通过扭转螺旋弹簧C13e的施力而沿逆时针方向旋转，与止挡件C13f抵接来恢复到原本的待机位置。当圆形杯收纳器C20进一步沿逆时针方向旋转时，通过各个分隔板C22来输送预备杯列WY，原本位于紧挨销售货道CK之前的预备杯列WY到达基部C10的杯列给送口C15上。之后，到达杯列给送口C15的预备杯列WY如图13的(b)所示那样经由杯列给送口C15落下，堆叠在其下方所残留的杯W上，与该杯W一起构成销售杯列WK。

[0260] 在该情况下，当由杯售罄检测开关C37检测出销售杯列WK的杯W已变为规定数量以上时，驱动装置C40的电动机C41停止，原本旋转的圆形杯收纳器C20也停止。由此，预备杯列WY向杯列给送口C15的放置完成。之后，开展销售，在销售杯列WK的杯W变为规定数量以下时，与上述同样地，其它预备杯列WY依次被输送到杯列给送口C15侧来被放置于此。

[0261] 图14的(a)示出了以下状态：圆形杯收纳器C20相对于适当的停止位置而言沿逆时针方向过度旋转了少许，放置于杯列给送口C15的销售杯列WK被分隔板C22按压于上滑槽C34等。在该情况下，与图12的(c)同样地，肋C27与返回构件C13的按压凸部C13c卡合来进行按压，由此返回构件C13抵抗扭转螺旋弹簧C13e的施力来沿顺时针方向旋转。

[0262] 在销售杯列WK被分隔板C22按压于上滑槽C34等的情况下，有时销售杯列WK为悬空状态，无法经由杯列给送口C15将销售杯列WK送到下方的落杯环C30。然而，根据上述的单种圆形杯供给机构C-1，当在销售时为了从销售杯列WK分离最下层的杯W1而驱动装置C40的电动机C41沿反向旋转、输出轴C43沿逆时针方向旋转时，通过第一单向离合器，容许驱动齿轮C44相对于输出轴C43向逆时针方向旋转。由此，也容许与驱动齿轮C44啮合的收纳器旋转构件C46向顺时针方向的旋转。也就是说，在驱动落杯环C30时，经由下连结用具C28来与收纳器旋转构件C46连结的圆形杯收纳器C20能够在无负荷状态下向顺时针方向旋转。

[0263] 因而，在图14的(a)所示的状态下，在通过电动机C41向反向旋转来驱动落杯环C30时，通过扭转螺旋弹簧C13e的施力，返回构件C13沿逆时针方向旋转，由此其按压凸部C13c按压所卡合的肋C27。由此，如图14的(b)所示，圆形杯收纳器C20沿顺时针方向旋转少许，返回到规定的适当位置，分隔板C22对销售杯列WK的按压状态被消除。

[0264] 如以上所详细叙述的那样，根据该单种圆形杯供给机构C-1，即使在处于销售杯列WK被分隔板C22按压的状态的情况下，也能够通过返回构件C13来使圆形杯收纳器C20返回到规定的适当位置，由此消除上述的销售杯列WK的按压状态。另外，在因向圆形杯收纳器C20补充杯W的操作员在其作业后碰触圆形杯收纳器C20等而处于放置于基部C10的杯列给送口C15的销售杯列WK被分隔板C22按压的状态时，也同样能够通过返回构件C13来消除销售杯列WK的按压状态。如以上那样，根据上述的单种圆形杯供给机构C-1，能够可靠地消除销售杯列WK被分隔板C22按压的状态，从而能够确保杯W的稳定的供给。

[0265] <两种圆形杯供给机构C-2>

[0266] 两种圆形杯供给机构C-2能够分别收纳大小不同的2个种类的大量的杯W来进行供给，如图15和图16所示，两种圆形杯供给机构C-2构成为在基部C10之上具备2个圆形杯收纳器C20。各个圆形杯收纳器C20具有与单种圆形杯供给机构C-1所示的圆形杯收纳器同等的结构。另一方面，在基部C10针对各个圆形杯收纳器C20设置有独立的落杯环C30、驱动装置C40。关于杯供给控制部(未图示)，既可以针对每个圆形杯收纳器C20设置独立的杯供给控制部，也可以针对2个圆形杯收纳器C20设置共用的杯供给控制部(未图示)。

[0267] 在该两种圆形杯供给机构C-2中，在通过由使用者按下选择按钮来对杯式自动售货机1的控制部R提供了销售指令的情况下，从控制部R对杯供给控制部(未图示)提供杯供给指令。例如，在针对各个圆形杯收纳器C20设置有独立的杯供给控制部(未图示)的情况下，基于销售指令中包含的与杯W的大小有关的信息，从控制部R对收纳有符合的大小的杯W的圆形杯收纳器C20的杯供给控制部(未图示)提供杯供给指令。

[0268] 另一方面，在针对2个圆形杯收纳器C20设置有共用的杯供给控制部(未图示)的情况下，只要使从控制部R提供的杯供给指令包含与要供给的杯W的大小有关的信息即可。被提供杯供给指令的杯供给控制部(未图示)根据杯供给指令中包含的与杯W的大小有关的信息，将收纳有符合的大小的杯W的圆形杯收纳器C20作为对象来实施杯W的供给动作。

[0269] 如以上那样，根据具备两种圆形杯供给机构C-2的杯式自动售货机1，能够利用大小不同的2个种类的杯W来提供饮料。此外，由各个圆形杯收纳器C20实施的杯W的供给动作与在单种圆形杯供给机构C-1中说明的供给动作相同，因此省略各自的详细说明。另外，在2个圆形杯收纳器C20中，未必收纳不同大小的杯W，也能够将相同大小的杯W收纳在各个圆形杯收纳器C20中来使用。

[0270] <单种圆形+单种单列杯供给机构C-3>

[0271] 如图17和图18所示，单种圆形+单种单列杯供给机构C-3是上述的两种圆形杯供给机构C-2的一个圆形杯收纳器C20变为单列杯收纳器C20′而成的。单列杯收纳器C20′在沿上下方向延伸的方筒状的外壳C21′的内部构成仅收纳销售杯列WK的销售货道CK。在基部C10，针对圆形杯收纳器C20和单列杯收纳器C20′设置有独立的落杯环C30、驱动装置C40。关于杯供给控制部(未图示)，既可以针对圆形杯收纳器C20和单列杯收纳器C20′设置独立的杯供给控制部，也能够针对圆形杯收纳器C20和单列杯收纳器C20′设置共用的杯供给控制部(未图示)。

[0272] 在该单种圆形+单种单列杯供给机构C-3中，在通过由使用者按下选择按钮来对杯式自动售货机1的控制部R提供了销售指令的情况下，从控制部R对杯供给控制部(未图示)提供杯供给指令。例如，在针对圆形杯收纳器C20和单列杯收纳器C20′设置有独立的杯供给控制部(未图示)的情况下，基于销售指令中包含的与杯W的大小有关的信息，从控制部R对收纳有符合的大小的杯W的圆形杯收纳器C20和单列杯收纳器C20′的杯供给控制部(未图示)提供杯供给指令。

[0273] 另一方面，在针对圆形杯收纳器C20和单列杯收纳器C20′设置有共用的杯供给控制部(未图示)的情况下，只要使从控制部R提供的杯供给指令包含与要供给的杯W的大小有关的信息即可。被提供杯供给指令的杯供给控制部(未图示)根据杯供给指令中包含的与杯W的大小有关的信息，将收纳有符合的大小的杯W的杯收纳器C20、C20′作为对象来实施杯W的供给动作。

[0274] 如以上那样，根据具备单种圆形+单种单列杯供给机构C-3的杯式自动售货机1，能够利用大小不同的2个种类的杯W来提供饮料。此外，由各个杯收纳器C20、C20′实施的杯W的供给动作与在单种圆形杯供给机构C-1中说明的供给动作相同，因此省略各自的详细说明。但是，单列杯收纳器C20′在内部仅收纳有销售杯列WK，因此在由杯售罄检测开关检测出杯W的售罄的时间点，杯W的供给结束。因而，优选的是，通知在单列杯收纳器C20′的内部没有杯W。另外，在圆形杯收纳器C20和单列杯收纳器C20′中，未必收纳不同大小的杯W，也能够将相同大小的杯W收纳在各个杯收纳器中来使用。

[0275] <单种方形杯供给机构C-4>

[0276] 单种方形杯供给机构C-4与单种圆形杯供给机构C-1同样地，收纳1个种类的大量的杯W来进行供给，如图19～图21所示，单种方形杯供给机构C-4具备基部C50、方形杯收纳器C60、落杯环C30、驱动装置C70(参照图23)、杯供给控制部(未图示)等。其中，方形杯收纳器C60将多个杯列沿直线收纳成1排。在图示的例子中，构成为能够收纳3个杯列的尺寸。

[0277] 基部C50的载置面C51构成为比方形杯收纳器C60的横截面大一圈，在中央部具有杯列给送口C52。即，在该单种方形杯供给机构C-4中，在方形杯收纳器C60的中央部划分出用于收纳销售杯列WK的销售货道CK，在其两侧划分出用于收纳预备杯列WY的预备货道CY。配设于杯列给送口C52的内部的落杯环C30具有与单种圆形杯供给机构C-1的落杯环相同的结构。

[0278] 方形杯收纳器C60具有外壁C61，该外壁C61是通过对规定形状的金属板进行折弯加工等而形成的。该外壁C61具有正面形状为纵长矩形的背壁部C61a以及从背壁部C61a的左右端部弯折为直角后向前方延伸的侧壁部C61b，该外壁C61形成为俯视时呈向前方敞开

的コ字状。在该外壁C61，以覆盖其顶面部和前表面上部的方式安装有上部罩C62。在上部罩C62，在前表面下端部以垂下的方式安装有由透明的薄片构成的前表面罩C63。能够在卷起前表面罩C63来将方形杯收纳器C60的前表面敞开的状态下收纳杯列。

[0279] 另外，在方形杯收纳器C60的内部设置有止挡棒C64和杯列补充装置C80。止挡棒C64限制收纳于方形杯收纳器C60的杯列的上限高度，并且发挥作为后述的支撑棒C83的止挡件的作用，止挡棒C64设置成在左右的侧壁部C61b之间水平地延伸。杯列补充装置C80用于在收纳于销售货道CK的杯W的数量变为规定数量(例如5个)以下时使预备货道CY中的任一个所收纳的预备杯列WY移动到销售货道CK，杯列补充装置C80被设置成左右对称。下面，关于杯列补充装置C80，以右侧的杯列补充装置为中心来进行说明。

[0280] 如图19～图21所示，杯列补充装置C80具备推棒C81、底部引导件C82、支撑棒C83。

[0281] 推棒C81通过向销售货道CK按压预备杯列WY来使预备杯列WY移动，推棒C81是通过对金属棒进行折弯加工等来形成为规定形状的。具体地说，具有沿上下方向延伸的主体部C81a以及从主体部C81a的上端部和下端部弯折为直角后相互平行地向后方水平地延伸的上连接部C81b和下连接部C81c，形成为コ字状。相对于方形杯收纳器C60内的止挡棒C64而言，推棒C81配置成主体部C81a位于前侧、上连接部C81b位于上侧。

[0282] 主体部C81a具有相比于基部C50的载置面C51与上部罩C62的顶面之间的距离而言短少许的程度的长度。另外，上连接部C81b具有规定长度，其顶端部向上方弯折为直角，旋转自如地支承在安装于上部罩C62的轴承C84。另一方面，下连接部C81c具有与上连接部C81b相同的长度，在其顶端部设置有向下方弯折为直角后延伸的弯折部C81d。该弯折部C81d在基部C50的比载置预备杯列WY的部分靠后侧少许的位置处贯通基部C50，并且与基部C50内的驱动装置C70连结。如以上那样构成的推棒C81以穿过上连接部C81b和下连接部C81c的顶端部的铅直轴线为中心，具体地说以弯折部C81d为中心，在待机位置与补充位置之间旋转自如，其中，该待机位置是主体部C81a位于预备货道CY侧时的位置(图19～图21等所示的位置)，该补充位置是主体部C81a位于销售货道CK侧、将预备杯列WY补充到销售货道CK时的位置(图25的(b)所示的位置)。

[0283] 底部引导件C82用于支承预备杯列WY的底部，并且一边保持预备杯列WY的姿势一边将预备杯列WY引导到销售货道CK，底部引导件C82设置于基部C50的后部，从后方面对载置面C51，并且配置于推棒C81的下连接部C81c的下侧。该底部引导件C82是由塑料构成的成形品，如图22所示那样形成为中央部分弯折的形状。底部引导件C82的内侧面形成为圆弧状，其曲率比杯W的底部大少许，且比杯W的开口部小。另外，在底部引导件C82的左半部设置有引导件壁部C82a。引导件壁部C82a形成为比底部引导件C82的右半部高。另一方面，在底部引导件C82的右半部，在其顶端部设置有向上方突出的卡合凸部C82b。该卡合凸部C82b位于推棒C81的下连接部C81c的右侧，并且具有能够从右方与该下连接部C81c抵接的高度。另外，在底部引导件C82的中央部形成有俯视形状为向后方敞开的U字状的退让槽C82c，通过该退让槽C82c，底部引导件C82不对推棒C81的弯折部C81d产生干扰。并且，在底部引导件C82，在退让槽C82c的左方形成有沿上下方向贯通的孔C82d。在该孔C82d处贯通有从后述的支撑棒C83的下连接部C83c的顶端部向下方弯折后延伸的弯折部C83d。因而，底部引导件C82以弯折部C83d为中心而旋转自如。

[0284] 支撑棒C83用于从销售货道CK侧支承预备杯列WY，由此保持预备杯列WY的姿势，支

撑棒C83与推棒C81大致相同，具有主体部C83a、上连接部C83b、下连接部C83c以及弯折部C83d。此外，该支撑棒C83位于设置于方形杯收纳器C60的内部的止挡棒C64的后侧。

[0285] 主体部C83a具有与推棒C81的主体部C81a大致相同的长度，另一方面，上连接部C83b和下连接部C83c比推棒C81的上连接部C81b和下连接部C81c短。另外，上连接部C83b的顶端部向上方弯折为直角，上连接部C83b通过轴承C84以旋转自如的方式支承于从推棒C81的上连接部C81b的顶端部向左方偏离少许的位置。该轴承C84中内置有弹簧(未图示)，该弹簧用于沿图21中的逆时针方向对支撑棒C83施力。另一方面，下连接部C83c位于底部引导件C82的引导件壁部C82a的背面侧。从下连接部C83c的顶端部向下方弯折的弯折部C83d以贯通底部引导件C82的孔的状态旋转自如地支承于基部C50。

[0286] 如以上那样构成的支撑棒C83以穿过上连接部C83b和下连接部C83c的顶端部的铅直轴线为中心，具体地说以弯折部C83d为中心而旋转自如。另外，如图19～图21所示，待机状态的支撑棒C83的主体部C83a位于销售货道CK与预备货道CY之间的接近止挡棒C64和销售杯列WK的位置。更具体地说，待机状态的支撑棒C83的主体部C83a位于止挡棒C64的后侧且销售杯列WK的斜后侧。此外，如后所述，在向销售货道CK补充预备杯列WY时，该主体部C83a被按压到该预备杯列WY，由此右侧的支撑棒C83以弯折部C83d为中心沿图21中的顺时针方向旋转，左侧的支撑棒C83沿逆时针方向旋转。

[0287] 另外，左右的支撑棒C83还发挥防止收纳于销售货道CK的销售杯列WK向左右方向倾斜的作用。例如，即使在由于销售杯列WK向右侧倾斜、与右侧的支撑棒C83抵接从而该支撑棒C83沿逆时针方向旋转的情况下，支撑棒C83也会与止挡棒C64抵接，由此其进一步的旋转被阻止。关于这一点，左侧的支撑棒C83也是同样的。这样，通过左右的支撑棒C83来防止销售杯列WK向左右方向倾斜，因此能够将销售杯列WK稳定地保持为垂直的姿势。因而，能够避免由于销售杯列WK与预备杯列WY相互干扰而引起的不良状况、例如销售杯列WK的供给不良，从而能够确保杯W的稳定的供给。

[0288] 图23示出了对落杯环C30和左右的杯列补充装置C80进行驱动的驱动装置C70。该驱动装置C70具有作为驱动源的电动机C71，并具备旋转驱动部C710和滑动机构部C720，该旋转驱动部C710通过被该电动机C71所驱动来主要进行旋转动作，该滑动机构部C720通过被旋转驱动部C710所驱动来进行向左右方向的滑动动作。

[0289] 旋转驱动部C710具有驱动体C711和3个旋转板C712，该驱动体C711借助齿轮箱C74被电动机C71所驱动，由此旋转和升降，通过该驱动体C711的旋转，3个旋转板C712中的某一个被旋转驱动。驱动体C711具有俯视形状为圆形的偏心凸轮C711a。虽然省略关于驱动体C711的详细构造的说明，但在电动机C71沿规定方向旋转时，在图23的(b)中驱动体C711例如沿逆时针方向旋转，由此偏心凸轮C711a升降。另一方面，在电动机C71沿与上述方向相反的方向旋转时，驱动体C711沿顺时针方向旋转，随之偏心凸轮C711a也沿顺时针方向旋转。

[0290] 3个旋转板C712设置成与滑动机构部C720的后述的3个滑动板C721A、C721B、C721C对应。这些旋转板C712彼此相同，形成为沿前后方向延伸的规定形状，并且配置成彼此堆叠。另外，各旋转板C712在前端部被从基部C50的下方部向上方延伸的支轴C713贯通，以该支轴C713为中心而旋转自如。

[0291] 滑动机构部C720具备：沿左右方向延伸并且配置成彼此堆叠的3个滑动板C721A、C721B、C721C；与其中上层的滑动板(下面称为“上层板C721A”)卡合、且用于驱动右侧的杯

列补充装置C80的推棒C81的右滑动件C722;以及与中层的滑动板(下面称为“中层板C721B”)卡合、且用于驱动左侧的杯列补充装置C80的推棒C81的左滑动件C723等。另外,下层的滑动板(下面称为“下层板C721C”)用于驱动落杯环C30,向下方延伸的驱动杆C724与落杯环C30的齿圈C32连结。

[0292] 上层、中层及下层板C721A、C721B、C721C均具有沿上下方向贯通的、沿左右方向延伸规定长度的长孔C725,借助该长孔C725被施力机构C726向左方施力。该施力机构C726包括:水平棒C727,其以在左右方向上水平地延伸的方式配置于上层板C721A的上方,被支承在基部C50的内部;滑动件C728,其设置成沿着该水平棒C727滑动自如;以及螺旋弹簧C729,其安装于水平棒C727,对滑动件C728向左方施力。在滑动件C728,设置有向下方延伸并贯穿上层、中层及下层板C721A、C721B、C721C的长孔C725的贯穿部C728a。在图23所示的待机状态下,滑动件C728的贯穿部C728a位于长孔C725的左内壁附近。

[0293] 右滑动件C722形成为沿左右方向延伸的规定形状,在上表面的右端部具有沿左右方向延伸规定长度的贯穿部C722a。另外,在右滑动件C722的上侧,设置有与上述贯穿部C722a啮合的小齿轮C730,该小齿轮C730设置成以铅直轴线为中心旋转自如。在该小齿轮C730的上部设置有向上方开口、俯视形状为十字状的槽C730a。而且,上述的右侧的杯列补充装置C80的推棒C81的弯折部C81d以嵌合于该槽C730a的状态被固定。另外,在右滑动件C722的内部设置有弹簧C731,通过该弹簧C731来对右滑动件C722向左方施力。由此,小齿轮C730为沿逆时针方向被施力的状态,因而,固定于该小齿轮C730的推棒C81平时为沿逆时针方向被施力的状态。

[0294] 另一方面,左滑动件C723形成为沿左右方向延伸的规定形状,与上述右滑动件C722呈前后和左右对称,在上表面的左端部具有齿条C723a。该齿条C723a与小齿轮C733啮合,左侧的杯列补充装置C80的推棒C81的弯折部C81d以嵌合于十字状的槽C733a的状态被固定。另外,左滑动件C723也与右滑动件C722同样地,被设置于其内部的弹簧C732向左方施力。由此,小齿轮C733为沿顺时针方向被施力的状态,因而,固定于该小齿轮C733的左侧的推棒C81也为沿顺时针方向被施力的状态。

[0295] 在此,说明如以上那样构成的驱动装置C70的动作。当电动机C71工作、沿规定方向旋转时,驱动体C711沿逆时针方向旋转,由此偏心凸轮C711a进行升降。

[0296] 例如,在对落杯环C30进行驱动的情况下,偏心凸轮C711a停止成位于与下层的旋转板C712相同的高度。之后,电动机C71沿与上述方向相反的方向旋转,由此驱动体C711沿顺时针方向旋转1圈,随之偏心凸轮C711a也沿相同方向旋转1圈。在该情况下,偏心凸轮C711a向右方按压下层的旋转板C712,由此该旋转板C712以支轴C713为中心沿顺时针方向旋转,抵抗施力机构C726的施力来向右方按压下层板C721C。由此,下层板C721C向右方滑动。此外,此时,施力机构C726的滑动件C728的贯穿部C728a被下层板C721C的长孔C725的左内壁按压,该滑动件C728向右方滑动。另外,当偏心凸轮C711a的旋转超过半圈时,原本向右方滑动的下层板C721C借助其长孔C725被施力机构C726的滑动件C728按压,从而向左方滑动,返回到原来的位置。通过这种下层板C721C的左右方向的往复移动,落杯环C30的齿圈C32沿周向往复移动。由此,所有杯分离凸轮C31同步地沿规定方向旋转规定角度之后沿反向旋转,返回到原来的位置。如以上那样,落杯环C30被驱动,由此从销售杯列WK分离出最下层的杯W1来运出到下方。

[0297] 另外，在对右侧的杯列补充装置C80进行驱动的情况下，偏心凸轮C711a进行升降，停止成位于与上层的旋转板C712相同的高度。之后，与驱动落杯环C30的情况同样地，偏心凸轮C711a旋转1圈，由此，借助上层的旋转板C712，抵抗施力机构C726的施力来向右方按压上层板C721A。由此，上层板C721A向右方滑动，并且抵抗弹簧C731的施力来按压右滑动件C722，使右滑动件C722向右方滑动。这样，右滑动件C722向右方滑动，由此与贯穿部C722a啮合的小齿轮C730沿顺时针方向旋转规定角度。另外，当偏心凸轮C711a的旋转超过半圈时，上层板C721A被施力机构C726的滑动件C728按压，由此向左方滑动，返回到原来的位置。随之，右滑动件C722通过弹簧C731的施力而向左方滑动，返回到原来的位置，并且小齿轮C730沿逆时针方向旋转，返回到原来的位置。通过这种右滑动件C722的左右方向的往复移动，小齿轮C730沿周向往复移动。由此，右侧的杯列补充装置C80的推棒C81从待机位置旋转到补充位置，之后，沿反向旋转，返回到待机位置。也就是说，推棒C81利用电动机C71的动力来进行从待机位置向补充位置的旋转，利用弹簧C731的施力来进行从补充位置向待机位置的恢复旋转。如以上那样，右侧的杯列补充装置C80被驱动，由此右侧的预备货道CY内的预备杯列WY被补充到销售货道CK。

[0298] 并且，在对左侧的杯列补充装置C80进行驱动的情况下，偏心凸轮C711a进行升降，停止成位于与中层的旋转板C712相同的高度。之后，与上述的情况同样地，偏心凸轮C711a旋转1圈，由此，借助中层的旋转板C712，抵抗施力机构C726的施力来向右方按压中层板C721B。由此，中层板C721B向右方滑动，并且抵抗弹簧C732的施力来按压左滑动件C723，使左滑动件C723向右方滑动。这样，左滑动件C723向右方滑动，由此与齿条C723a啮合的小齿轮C733沿逆时针方向旋转规定角度。另外，当偏心凸轮C711a的旋转超过半圈时，与上层板C721A的情况同样地，中层板C721B向左方滑动，返回到原来的位置。随之，左滑动件C723通过弹簧C732的施力而向左方滑动，返回到原来的位置，并且小齿轮C733沿顺时针方向旋转，返回到原来的位置。通过这种左滑动件C723的左右方向的往复移动，小齿轮C733沿周向往复移动。由此，左侧的杯列补充装置C80的推棒C81与前述的右侧的杯列补充装置C80的推棒同样地，在从待机位置旋转到补充位置之后，返回到待机位置。如以上那样，左侧的杯列补充装置C80被驱动，由此左侧的预备货道CY内的预备杯列WY被补充到销售货道CK。

[0299] 如图23所示，在该单种方形杯供给机构C-4中也在上滑槽C34设置有用于使杯售罄检测开关C37工作的杯售罄检测杆C36。

[0300] 图24和图25示出了从右侧的预备货道CY向销售货道CK补充预备杯列WY的补充动作。此外，在补充动作开始前的待机状态下，如图24的(a)所示，推棒C81位于待机位置，由此其主体部C81a位于预备杯列WY的右方，并且底部引导件C82的引导件壁部C82a位于预备杯列WY的底部的左斜后侧。

[0301] 当从该状态起推棒C81以弯折部C81d为中心沿顺时针方向旋转时，如图24的(b)和(c)中依次示出的那样，主体部C81a与预备杯列WY的所有杯W的卷曲部抵接，所有杯W的卷曲部被按压，由此预备杯列WY向左方的销售货道CK侧移动。在该情况下，预备杯列WY的底部与底部引导件C82的引导件壁部C82a抵接，对其进行按压，由此底部引导件C82以支撑棒C83的弯折部C83d为中心沿顺时针方向旋转。另外，在该情况下，底部引导件C82的卡合凸部C82b无法越过推棒C81的下连接部C81c来向左方移动，由此底部引导件C82以被推棒C81限制了向销售货道CK侧的旋转的状态进行旋转。并且，在该情况下，预备杯列WY的所有杯W的卷曲

部与支撑棒C83的主体部C83a抵接，对其进行按压，由此支撑棒C83也以其弯折部C83d为中心沿顺时针方向旋转。这样，预备杯列WY在分别被推棒C81、底部引导件C82以及支撑棒C83从卷曲部的右侧方、底部的左后方以及卷曲部的左后方支承的同时向左方移动。另外，在该情况下，预备杯列WY以载置于载置面C51的状态移动，因此预备杯列WY一边被该载置面C51的周壁部引导预备杯列WY的底部，一边向左方顺畅且稳定地移动。

[0302] 当推棒C81进一步旋转时，如图25的(a)所示，预备杯列WY进一步向左方移动。然后，底部引导件C82对预备杯列WY的底部的支承被解除，底部引导件C82留在该位置。之后，通过推棒C81进一步旋转，支撑棒C83对预备杯列WY的支承也被解除，支撑棒C83通过上端部的弹簧的施力而沿逆时针方向旋转，返回到原来的位置。然后，如该图的(b)所示，当推棒C81到达补充位置时，预备杯列WY到达杯列给送口C52的上方，由此被引导到杯列给送口C52的内侧来落下，预备杯列WY的下端部贯穿杯列给送口C52，并且，预备杯列WY以进入残留的销售杯列WK的最上层的杯W的状态堆叠于残留的销售杯列WK，从而被补充到销售货道CK。这样，预备杯列WY堆叠于销售杯列WK，由此杯售罄检测杆C36被所补充的预备杯列WY按压，从杯列给送口C52退避。

[0303] 之后，推棒C81如图25的(c)所示那样沿逆时针方向旋转，返回到待机位置。在向该待机位置恢复时，推棒C81的下连接部C81c与底部引导件C82的卡合凸部C82b抵接，对其向右方进行按压，由此底部引导件C82也沿逆时针方向旋转，返回到原来的位置。通过以上，向销售货道CK补充预备杯列WY的补充动作完成。

[0304] 此外，在补充上述的预备杯列WY后开展饮料的销售，在销售杯列WK的杯W变为规定数量以下时，与上述的情况同样地，左侧的预备货道CY的预备杯列WY被补充到销售货道CK。

[0305] <原料供给机构D>

[0306] 如图26、图27、图46所示，原料供给机构D用于每次向滑槽D20喷出规定量的贮存于罐D10的饮料的原料、例如速溶咖啡、可可粉或奶油粉等粉末原料或者咖啡豆、茶叶等提取原料，并进一步从滑槽D20放出到杯W、研磨机K。

[0307] <粉末原料供给机构D-1>

[0308] 图26～图28示出将贮存于罐D10的速溶咖啡、可可粉或者奶油粉等粉末原料放出到由杯输送机构H输送的杯W(参照图43)的粉末原料供给机构D-1。下面，为了方便起见，将图26和图27中的右侧的部分作为前方、将左侧的部分作为后方来进行说明。

[0309] 罐D10构成为具有：容器主体D11，其呈在上端具有投入口D11a的箱状；料斗D12，其设置于容器主体D11的下端部；以及送出部D13，其设置于料斗D12的下端部。

[0310] 容器主体D11是横截面呈矩形的筒状部分。容器主体D11的投入口D11a设置为以前方的缘的高度比后方的缘的高度低的方式倾斜。在容器主体D11的投入口D11a设置有盖体D14。盖体D14例如以能够借助后方的缘部来旋转的方式配设于容器主体D11。如图29所示，如果以使前方的缘部向上方移动的方式操作盖体D14，则能够敞开容器主体D11的投入口D11a。如果使前方的缘部向下方移动，则能够利用盖体D14来关闭容器主体D11的投入口D11a。

[0311] 在盖体D14的后方部与容器主体D11之间设置有卡定机构D15。卡定机构D15用于将盖体D14维持为打开的状态，例如通过在盖体D14处设置滑动构件D15a、且在容器主体D11处设置滑动引导件D15b来构成卡定机构D15。滑动构件D15a是呈以盖体D14的旋转中心为中心

的扇形的薄板状构件，设置于盖体D14的两侧。在各滑动构件D15a的表面设置有突起D15c。滑动引导件D15b配设成使盖体D14的滑动构件D15a能够在滑动引导件D15b与容器主体D11的侧面之间滑动。在该卡定机构D15中，在打开盖体D14的情况下，滑动构件D15a的突起D15c会通过滑动引导件D15b与容器主体D11之间的间隙。在该状态下，即使使手离开盖体D14，由于突起D15c被卡定在滑动引导件D15b与容器主体D11之间，因此盖体D14也被维持为打开的状态。如果从该状态起向下方按下盖体D14，则突起D15c通过滑动引导件D15b与容器主体D11之间的间隙，能够利用盖体D14来关闭容器主体D11的投入口D11a。

[0312] 在容器主体D11的作为其前表面的部位设置有指示器D16。指示器D16配设成能够相对于设置于容器主体D11的沿着上下的导轨部D11b移动、且能够停止在任意的位置。该指示器D16的前表面为白色，能够记载容器主体D11中贮存的粉末原料的名称。

[0313] 另外，如图26～图30所示，在容器主体D11设置有原料检测传感器D17。原料检测传感器D17在容器主体D11中贮存的粉末原料低于预先设定的下限量的情况下检测出该情况。作为原料检测传感器D17，通过在容器主体D11的一个侧面设置发光元件D17a、且在另一个侧面的与发光元件D17a相向的部分设置受光元件D17b来构成该原料检测传感器D17。即，以如下的方式构成原料检测传感器D17：在从发光元件D17a照射的光入射到受光元件D17b的情况下，将该原料检测传感器D17的检测信号输出到原料供给控制部(未图示)。

[0314] 料斗D12是呈漏斗状的部分，其构成为前后方向的尺寸随着去向下方而逐渐变小。在料斗D12的内部配设有2个用于搅拌所贮存的粉末原料的轮D18。

[0315] 如图26～图28所示，送出部D13是构成为轴心沿前后方向大致水平的中空部分，经由其中央上部来与料斗D12的内部连通，并且经由设置于其前端部的喷出口D13a来与滑槽D20的上端内部连通。在该送出部D13的内部配设有螺旋钻螺杆D19。螺旋钻螺杆D19在轴部的外周面具有螺旋状的突条D19a，能够以使突条D19a的外周面与送出部D13的内周面接近的状态绕轴部的轴心旋转。在螺旋钻螺杆D19旋转的情况下，送出部D13与突条D19a之间构成的空间依次向前方移动。即，从容器主体D11经过料斗D12后到达送出部D13的粉末原料通过螺旋钻螺杆D19的旋转来依次被送出到前方，并从送出部D13的喷出口D13a放出到滑槽D20。根据图也可以明确，该螺旋钻螺杆D19的基端部经由设置于送出部D13的后端部的滑动孔D13b而向外部突出，该突出的基端部经由齿轮箱D30来与螺杆电动机D31连结。

[0316] 滑槽D20是沿上下方向延伸、且在下端具有放出口D21的筒状构件。在滑槽D20的下端部配设有闸门D22。闸门D22配设成能够以支承轴部D22a为中心来进行旋转。在闸门D22配置于图28中的实线所示的闭塞位置的情况下，滑槽D20的放出口D21被闭塞。在闸门D22配置于图28中的双点划线所示的开放位置的情况下，滑槽D20的放出口D21被开放。如图31所示，在闸门D22中，在闸门D22配置于闭塞位置时处于上方的面(图31中的交叉阴影线部分)被实施作为提高吸热率的处理的黑色的涂装。

[0317] 在该闸门D22，在支承轴部D22a的作为滑槽D20的外部的位置设置有闸门开放杆D23。闸门开放杆D23设置成与闸门D22连动。在该闸门开放杆D23处，与滑槽D20之间设置有拉伸弹簧D24。拉伸弹簧D24进行施力，以借助闸门开放杆D23和支承轴部D22a来使闸门D22平时处于闭塞位置。在闸门D22位于闭塞位置的情况下，闸门开放杆D23为向后下(在图30中为右下)倾斜的姿势，另一方面，在闸门D22位于开放位置的情况下，闸门开放杆D23为向后上(在图30中为右上)倾斜的姿势。也就是说，闸门D22与闸门开放杆D23的后端部的上下运

动连动地对滑槽D20的放出口D21进行开闭。

[0318] 如图26和图27所示，上述的粉末原料供给机构D-1是按所贮存的粉末原料的种类来准备的，以按彼此相同的朝向并排设置的状态配设于设备壳体2的内部。针对并排设置的多个粉末原料供给机构D-1的滑槽D20设置有罩构件D40。罩构件D40呈下表面开口的箱状，配设成包围并排设置的多个滑槽D20。在该罩构件D40的内部，在作为滑槽D20的后方侧的部位配设有第一加热器D41，并且在作为滑槽D20的前方侧的部位配设有第二加热器D42。

[0319] 如图32所示，第一加热器D41和第二加热器D42分别是在金属制的护套D43的内部将电热丝D44铺设为面状而构成的，分别呈长条的平面状，护套D43的前表面为发热基准面D45，如图27和图30所示，各个发热基准面D45被配设成与滑槽D20相向的状态。如图30所示，配设于滑槽D20的后方侧的第一加热器D41配设于滑槽D20的高度方向上的大致中间的位置，固定为发热基准面D45朝向斜上方的姿势。该第一加热器D41主要发挥对滑槽D20的与发热基准面D45相向的后方侧中间部分进行加热来使温度上升的功能，应用了加热能力比第二加热器D42的加热能力小的加热器。配设于滑槽D20的前方侧的第二加热器D42配设于滑槽D20的下端部的、配置于闭塞位置的闸门D22的正前方的部位，固定为发热基准面D45朝向斜上方的姿势。该第二加热器D42主要发挥对保留于滑槽D20的内部的粉末原料进行加热来防止吸湿的功能，应用了加热能力比第一加热器D41的加热能力大的加热器。根据图30也可以明确，第一加热器D41和第二加热器D42的发热基准面D45的整个面均位于相比于配置于闭塞位置的闸门D22而言靠上表面侧的位置，第一加热器D41和第二加热器D42的发热基准面D45在沿着闸门D22的上表面的方向上彼此并排设置。

[0320] 图33～图39示出用于使滑槽D20的闸门D22进行动作的闸门开闭装置D50。闸门开闭装置D50具备外壳D51、闸门开闭杆D52、选择杆D53、凸轮装置D54、驱动齿轮D55、拉伸弹簧D56、片簧D57，闸门开闭装置D50被设为单元化。

[0321] 外壳D51沿左右方向延伸，配置于滑槽D20的后方、且相对于杯输送机构H的通过路径而言配置于上侧。闸门开闭杆D52用于对滑槽D20的闸门D22进行开闭，与各个滑槽D20对应地设置。选择杆D53用于选择要工作的闸门开闭杆D52，与各个闸门开闭杆D52对应地设置。凸轮装置D54借助凸轮部D54a来与闸门开闭杆D52卡合。驱动齿轮D55与凸轮装置D54的齿轮部D54b啮合，利用销D55a来与驱动电动机D58的旋转轴D58a连结。拉伸弹簧D56的一端与闸门开闭杆D52连接，且另一端与选择杆D53连接。该拉伸弹簧D56以如下方式发挥功能：对闸门开闭杆D52向逆时针方向施力，并且对选择杆D53向接近闸门开闭杆D52的方向施力。片簧D57支承于闸门开闭杆D52，以如下方式发挥功能：通过与凸轮装置D54的凸轮部D54a卡合来使凸轮装置D54开始沿顺时针方向旋转。该闸门开闭装置D50如上述那样被单元化，因此易于根据罐D10的数量来构成。

[0322] 根据多个滑槽D20的间隔来在左右方向上彼此隔开间隔地配置多个闸门开闭杆D52，闸门开闭杆D52分别构成为以旋转孔D52b为中心而旋转自如，该旋转孔D52b供沿左右方向延伸的支承轴D52a轴固定。如图36和图37所示，各个闸门开闭杆D52以支承轴D52a为中心，配设于后端部(图36的右端)的杆销D52c与凸轮装置D54的凸轮部D54a卡合，平时，在拉伸弹簧D56的张力下，前端部D52d(图36的左端)停止在最下层的待机位置。

[0323] 而且，构成为以下结构：当凸轮装置D54沿图36的(a)中的顺时针方向旋转时，与凸轮部D54a卡合的杆销D52c被按下，由此前端部D52d旋转到将闸门开放杆D23的后端部D23a

顶上去的按压位置(图43所示的位置)。另外,在闸门开闭杆D52的左中央部(图37的(a)所示的位置)的下侧设置有按压突起部D52e。

[0324] 如图36和图38所示,选择杆D53由杆部D53a、凸轮抵接部D53b、槽部D53c构成。在杯输送机构H进行动作的情况下,杆部D53a被杯输送机构H的外壳H160所按压。凸轮抵接部D53b处于与凸轮装置D54的后述的凸轮止挡部D54d抵接的状态,当杆部D53a移动到后方(图36的(a)的右方向)时(参照图40),凸轮抵接部D53b从凸轮止挡部D54d脱离,使得凸轮装置D54能够沿顺时针方向(参照图36的(a))旋转。槽部D53c用于使选择杆D53沿着外壳D51的滑动板D51a在前后方向上滑动。

[0325] 杆部D53a延伸至比杯输送机构H中的外壳H160的上表面高度低的位置(参照图40),在杯输送机构H通过选择杆D53的下侧时,外壳H160将杆部D53a向后方(图40的右方向)按压。通过该按压,选择杆D53的凸轮抵接部D53b向后方移动(参照图42的(a)),从凸轮止挡部D54d脱离。通过凸轮抵接部D53b从凸轮止挡部D54d脱离,利用片簧D57被开放的反作用力,片簧D57将凸轮部D54a的卡合的部分举起,由此凸轮装置D54开始沿顺时针方向(参照图36的(a))旋转,凸轮装置D54的齿轮部D54b与驱动齿轮D55啮合,利用通过驱动电动机D58沿逆时针方向旋转的驱动齿轮D55来沿顺时针方向继续旋转。

[0326] 当杯输送机构H的外壳H160将杆部D53a按压至规定的位置时,外壳H160被杯输送机构H的Y轴部H2向前方输送少许,暂时停止在规定的位置。随之,杯W相对于滑槽D20暂时停止在放出口D21的铅直下方,规定量的粉末原料从滑槽D20供给到杯W。

[0327] 如图36和图39所示,凸轮装置D54具有凸轮部D54a、齿轮部D54b、齿轮缺口部D54c、凸轮止挡部D54d,凸轮装置D54构成为以旋转孔D54f为中心而旋转自如,该旋转孔D54f被沿左右方向延伸的旋转轴D54e轴支承。凸轮部D54a设置于凸轮装置D54的一个面,与闸门开闭杆D52的杆销D52c卡合。齿轮部D54b通过与驱动齿轮D55啮合来将驱动齿轮D55的旋转传递到凸轮装置D54。在凸轮部D54a设置有多个(在图示的例子中为3个)凹部D54g。齿轮缺口部D54c平时与驱动齿轮D55相向,来切断驱动齿轮D55的旋转。凸轮止挡部D54d设置于凸轮装置D54的另一个面,平时与选择杆D53的凸轮抵接部D53b抵接,由此阻止凸轮装置D54的旋转。凸轮止挡部D54d以如下方式发挥功能:当杆部D53a向后方移动时,凸轮止挡部D54d从与凸轮抵接部D53b抵接的状态脱离,由此使得凸轮装置D54能够旋转。

[0328] 说明如上述那样构成的闸门开闭装置D50的动作。当使用者例如通过操作单元U的操作输入部U1选择了加奶油/砂糖的速溶咖啡时,从杯供给机构C分离的杯W被供给到杯输送机构H。与从杯供给机构C向杯输送机构H供给杯W大致同时地,收纳有要供给到杯W的粉末原料的罐D10的螺杆电动机D31进行驱动,将规定量的粉末原料放出到滑槽D20。此时,在滑槽D20中,闸门D22配置于闭塞位置,因此从罐D10放出的粉末原料暂时保留于内部。

[0329] 接着,当通过杯输送机构H的动作而杯W配置于滑槽D20的下方时,如图40所示,外壳H160向后方移动,由此杆部D53a被向后方按压,凸轮抵接部D53b从凸轮止挡部D54d脱离。之后,如图41所示,外壳H160向前方移动,杯W返回到滑槽D20的下方。

[0330] 如图42的(a)所示,当凸轮抵接部D53b从凸轮止挡部D54d脱离时,凸轮装置D54利用片簧D57的反作用力来开始沿顺时针方向旋转,如图42的(b)所示,齿轮部D54b与驱动齿轮D55啮合。由此,利用通过驱动电动机D58沿逆时针方向旋转的驱动齿轮D55,凸轮装置D54沿顺时针方向继续旋转。

[0331] 当凸轮装置D54沿顺时针方向旋转时，如图42的(c)所示，闸门开闭杆D52的杆销D52c沿着凸轮部D54a的外周向被按下的方向移动，闸门开闭杆D52沿顺时针方向旋转，由此如图43所示，其前端部D52d将闸门开放杆D23的后端部D23a顶起。其结果，闸门D22沿逆时针方向旋转而成为铅直状态，滑槽D20的放出口D21被开放，原本保留于滑槽D20的规定量的粉末原料被放出到杯W。

[0332] 当从上述的状态起凸轮装置D54进一步沿顺时针方向旋转时，如图44所示，闸门开闭杆D52的杆销D52c沿着设置于凸轮部D54a的多个凹部D54g而沿上下方向移动，随着杆销D52c的上下方向的移动，闸门开闭杆D52沿逆时针方向和顺时针方向重复旋转多次(在图示的例子中为3次)。

[0333] 通过闸门开闭杆D52沿逆时针方向和顺时针方向重复进行的旋转，利用拉伸弹簧D24的作用，闸门D22冲击性地振动。由此，即使粉末原料被压缩并粘着在闸门D22的上表面，也能够通过上述的冲击性的振动来使其从闸门D22落下，能够防止粉末原料残留在滑槽D20。

[0334] 当凸轮装置D54进一步沿顺时针方向旋转时，齿轮缺口部D54c到达与驱动齿轮D55相向的位置，并且凸轮止挡部D54d与选择杆D53的凸轮抵接部D53b抵接。由此，利用驱动齿轮D55来进行的凸轮装置D54的旋转停止。当凸轮装置D54的旋转停止时，闸门开闭杆D52利用拉伸弹簧D56的张力而沿逆时针方向旋转，滑槽D20的放出口D21被闸门D22闭塞。此后，对所有收纳有要向杯W供给的粉末原料的罐D10重复进行上述的动作。

[0335] 在此期间，第一加热器D41和第二加热器D42分别处于被通电的状态，从发热基准面D45进行放热。在此，如上所述，第二加热器D42的发热基准面D45在相比于配置于闭塞位置的闸门D22而言靠上表面侧的位置朝向斜上方。因而，在闸门D22的上表面保留有粉末原料的情况下，粉末原料通过来自该第二加热器D42的热而被加热，维持为干燥的状态。附着于闸门D22的周围、滑槽D20的内表面而残留的粉末原料也通过来自第二加热器D42的热而被持续加热。而且，由于对闸门D22的上表面实施了黑色的涂装，因此从第二加热器D42辐射的热被高效地吸收，与应用白色或透明的闸门D22的情况相比，即使在使用相同的加热能力的加热器的情况下，也能够使其周围温度上升2℃左右。由此，消除了在闸门D22与滑槽D20之间粉末原料吸湿而固化的担忧，能够保证闸门D22的稳定的动作，从而能够始终可靠地进行粉末原料的放出。特别是，闸门D22是直接载置粉末原料的部分，因此如果对其进行加热，则能够更高效地防止粉末原料的吸湿。然而，难以对相对于滑槽D20在开放位置与闭塞位置之间移位的闸门D22配置加热器等加热单元。因而，如上述那样将闸门D22的上表面涂装成黑色以提高吸热率由此能够使闸门D22的温度上升的粉末原料供给机构D-1是划时代的，不需要专用于闸门D22的加热器，而且能够将第二加热器D42的热高效地传递到粉末原料，因此作为第二加热器D42，也能够应用加热能力小的加热器。

[0336] 另一方面，从第二加热器D42辐射的热的一部分通过闸门D22之后，被位于后方侧的滑槽D20反射，朝向前方侧向斜上方行进。对从第二加热器D42辐射的热进行反射的部分因第一加热器D41而处于温度上升的状态。因而，不招致大的热损失地使从第二加热器D42辐射的热在滑槽D20处反射后到达上方。除此以外，还将第一加热器D41配置在罐D10的下方且比第二加热器D42靠上方的位置，因此从第一加热器D41辐射的热的一部分也到达罐D10的下端部、也就是说喷出粉末原料的喷出口D13a的附近。其结果是，在罐D10的送出部D13

中，粉末原料也被加热而维持为干燥的状态，因此消除了在螺旋钻螺杆D19与罐D10的送出部D13之间粉末原料吸湿而固化的担忧，能够保证螺旋钻螺杆D19的稳定的动作。

[0337] 如上所述，关于主要发挥对滑槽D20的后方侧中间部分进行加热来使温度上升的功能的第一加热器D41，只要应用加热能力比第二加热器D42的加热能力小的加热器就足够了。因而，能够将消耗电力也抑制得低，也不存在招致运行成本显著增大的事态的担忧。

[0338] 此外，作为第一加热器D41和第二加热器D42，未必限于呈平板状，也可以如图45所示那样，应用弯曲的加热器D46、D47、弯折的加热器D48。此外，在本说明书中使用的发热基准面D45用于规定来自加热器的热的辐射方向，在如上述那样呈平板状的情况下为该加热器的前表面。在如图45的(a)、图45的(b)所示那样横截面为弯曲状的加热器D46、D47的情况下，发热基准面D45为包含位于最上方的电热丝D44和位于最下方的电热丝D44的平面。在如图45的(c)所示那样中途弯折的加热器D48的情况下，在各个前表面存在独立的发热基准面D45。

[0339] 当开展饮料的销售、从而贮存于罐D10的粉末原料减少时，通过原料检测传感器D17检测出该情况，例如通过原料供给控制部(未图示)来通知该情况。因而，操作员能够在打开前表面门3后打开盖体D14来向罐D10补充粉末原料。此时，如上所述，在容器主体D11与盖体D14之间设定有卡定机构D15，因此能够将盖体D14维持为打开状态后补充粉末原料，从而能够使该作业容易化。而且，只要将指示器D16适当地上下移动来预先决定与销售量相应的补充量，就不会过剩地补充粉末原料。即，对于贮存销售量多的粉末原料的罐D10，将指示器D16事先配置在上方，对于贮存销售量少的粉末原料的罐D10，将指示器D16事先配置在下方。只要操作员以各个指示器D16被配置的位置为上限来补充粉末原料，补充各个粉末原料的周期就会大致相同，消除了招致以下事态的担忧：特定的粉末原料频繁变空，或者反之特定的粉末原料长期地贮存于罐D10。

[0340] <提取原料供给机构D-2>

[0341] 如图46和图47所示，提取原料供给机构D-2将贮存于罐D10的咖啡豆、茶叶等提取原料放出到研磨机K。罐D10的构造具有与粉末原料供给机构D-1的罐同样的结构，仅在以下方面不同，其它结构一致。因而，对提取原料供给机构的各结构要素标注与粉末原料供给机构D-1的各结构要素相同的标记，省略各自的详细说明。

[0342] 1)在料斗D12未设置轮D18。

[0343] 2)在滑槽D20未设置闸门D22、第一加热器D41、第二加热器D42。

[0344] <储液器E>

[0345] 如图48所示，储液器E在设备壳体2的内部贮存生成饮料时所需的饮用水，另一方面，向温水箱F、制冰机G、碳酸化器Q等需要饮用水的机构部、被输送到烹调位置的杯W适当地供给饮用水。作为在储液器E中贮存饮用水的方法，除了直连自来水管方式以外，还存在筒式供水箱方式。下面，首先说明以直连自来水管方式贮存饮用水的储液器E。此外，图48中的标记N1是进行所通过的饮用水等的冷却的冷却水槽。该冷却水槽N1的上表面开口，该冷却水槽N1构成于设备壳体2中的储液器E的下方的部位处。

[0346] 如该图48所示，在该杯式自动售货机1中，储液器E经由具备滤水器(加入活性炭)E2和2个电磁供水阀E3、E4的供水管E5来与自来水管口连接。滤水器E2去除饮用水中包含的异物。2个电磁供水阀E3、E4是根据来自供水控制部(未图示)的指令来开闭供水管E5的电磁

式的开闭阀，分别设置于滤水器E2的上游侧和下游侧的部位处。

[0347] 如图49～图52所示，储液器E构成为具备储液器主体E11、盖体E12、检测棒E13、浮子开关E14。储液器主体E11是上表面开口的容器，在内部贮存通过供水管E5供给的饮用水。盖体E12用于闭塞储液器主体E11的上表面开口。在该盖体E12设置有与供水管E5的下游端连接的供水口E12a。检测棒E13以贯通设置于盖体E12的滑动部E12b的状态沿着上下方向延伸，且配设成能够沿着中心轴线上下移动。在该检测棒E13，在位于比盖体E12靠上方的位置的上端部具备凸缘E13a，并且在位于储液器主体E11的内部的下端部具备浮子E13b。凸缘E13a呈以检测棒E13的中心轴线为中心的圆形的薄板状。浮子E13b按照储液器主体E11中贮存的饮用水的变动适当地上下移动，来使检测棒E13相对于盖体E12上下移动。浮子开关E14具备高水位开关E14a和低水位开关E14b，根据检测棒E13从盖体E12突出的突出尺寸、也就是说根据储液器主体E11中贮存的饮用水的水位，来向供水控制部(未图示)输出检测信号，浮子开关E14安装于在盖体E12的上部设置的棒罩E16。在储液器主体E11中贮存的饮用水下降到供水开始水位的情况下，借助凸缘E13a而高水位开关E14a被操作，该高水位开关E14a对供水控制部(未图示)输出供水开始信号。当从高水位开关E14a提供供水开始信号时，从供水控制部(未图示)对2个电磁供水阀E3、E4输出开信号，2个电磁供水阀E3、E4均打开，由此从自来水管口到储液器主体E11的供水管E5被连通。另外，在饮用水上升到供水停止水位(>供水开始水位)的情况下，借助凸缘E13a而高水位开关E14a被操作，该高水位开关E14a对供水控制部(未图示)输出供水停止信号。当从高水位开关E14a提供供水停止信号时，从供水控制部(未图示)对2个电磁供水阀E3、E4输出闭信号，2个电磁供水阀E3、E4均关闭，由此从自来水管口到储液器主体E11的供水管E5被切断。在储液器主体E11中贮存的饮用水下降到销售停止水位(<供水开始水位)的情况下，借助凸缘E13a而低水位开关E14b被操作，该低水位开关E14b对供水控制部(未图示)输出饮用水的售罄信号。当从低水位开关E14b输出售罄信号时，从供水控制部(未图示)向水泵E1输出停止信号，水泵E1变为停止状态。

[0348] 在棒罩E16的高度互不相同的2个位置设置有插入孔E16a、E16b。插入孔E16a、E16b分别形成为能够插入棒位置保持轴E20的大小，在棒罩E16的彼此相向的部位各设置有2个插入孔E16a、E16b，使得所插入的棒位置保持轴E20大致水平。棒位置保持轴E20例如是如杯式自动售货机1的操作员通常会携带的螺丝、螺丝刀的轴部等那样呈圆柱状的构件。

[0349] 上方的插入孔E16a设置于如下位置：在检测棒E13配置于规定的上升位置的状态下将棒位置保持轴E20插入到上方的插入孔E16a的情况下，棒位置保持轴E20能够与凸缘E13a的下表面抵接，来阻止检测棒E13向下方的移动。在棒位置保持轴E20被插入到上方的插入孔E16a的情况下，无论储液器主体E11中贮存的饮用水的水位如何，都从高水位开关E14a向供水控制部(未图示)持续地输出供水停止信号。

[0350] 下方的插入孔E16b设置于如下位置：在检测棒E13配置于规定的下降位置的状态下将棒位置保持轴E20插入到下方的插入孔E16b的情况下，棒位置保持轴E20能够与凸缘E13a的上表面抵接，来阻止检测棒E13向上方的移动。在棒位置保持轴E20被插入到下方的插入孔E16b的情况下，无论储液器主体E11中贮存的饮用水的水位如何，都从低水位开关E14b向供水控制部(未图示)持续地输出售罄信号。

[0351] 在如上述那样构成的储液器E中，通过打开2个电磁供水阀E3、E4，从自来水管口向储液器主体E11依次贮存饮用水。在此期间，随着水位的上升，浮子E13b上升，检测棒E13从

盖体E12突出的突出量逐渐增大。当储液器主体E11中贮存的饮用水达到规定的供水停止水位从而高水位开关E14a被操作时，由供水控制部(未图示)将2个电磁供水阀E3、E4均设为关闭的状态。由此，在储液器主体E11中贮存规定量的饮用水。此时，在该储液器E中，在供水管E5设置有2个电磁供水阀E3、E4，因此即使在电磁供水阀E3、E4的一方发生故障的情况下，也不存在招致储液器主体E11的饮用水溢出的事态的担忧。此外，即使饮用水从储液器主体E11溢出，溢出的饮用水也会被设置于下方的冷却水槽N1接住，并且在冷却水槽N1的下方还设置有排水托盘A10，因此不存在设备壳体2的内部发生污损的担忧。

[0352] 当随着饮料的销售而储液器主体E11中贮存的饮用水的水位减少、检测棒E13下降由此高水位开关E14a输出供水开始信号时，由供水控制部(未图示)将2个电磁供水阀E3、E4打开，向储液器主体E11的内部补充饮用水直到高水位开关E14a输出供水停止信号为止。此后，重复实施上述的动作，储液器主体E11的饮用水保持固定以上的水位。

[0353] 图53的(a)示出了以下状态：作为棒位置保持轴，将螺丝E20插入到上方的插入孔E16a，从而从高水位开关E14a持续地输出供水停止信号。图53的(b)示出了以下状态：将螺丝E20插入到下方的插入孔E16b，从而从低水位开关E14b持续地输出售罄信号。

[0354] 即，在图53的(a)所示的状态下，无论储液器主体E11的水位如何，2个电磁供水阀E3、E4均维持为关闭状态，因此不对储液器主体E11进行饮用水的补充。因而，在例如因操作员清洗水回路中的配管等维护上的理由而要将储液器主体E11的饮用水全部清空的情况下，只要将螺丝E20插入到设置于棒罩E16的上方的插入孔E16a来形成图53的(a)的状态即可。

[0355] 另一方面，在图53的(b)所示的状态下，由供水控制部(未图示)将水泵E1保持为停止状态，因此即使在下游的温水箱F、碳酸化器Q、烹调位置需要饮用水的情况下，也不会向这些机构供给饮用水。因而，在例如操作员进行设置于储液器E的下游的温水箱F的清洗的情况下，只要将螺丝E20插入到设置于棒罩E16的下方的插入孔E16b即可，即使不用手压住检测棒E13也不会从储液器E对温水箱F供给饮用水，从而操作员独自也能够容易地实施温水箱F的清洗。

[0356] 此外，作为保持检测棒E13的位置的方法，未必限于将棒位置保持轴E20插入到棒罩E16的插入孔E16a、E16b。例如，也可以如图54和图55所示那样，在棒罩E17设置狭缝状的插入部E17a、E17b，且在检测棒E18的凸缘E18a设置能够插入到插入部E17a、E17b的突片E18b。即，在通常时，如图55的(a)所示那样，使突片E18b为不受约束的状态。另一方面，在操作员进行作业的情况下，只要如图55的(b)所示那样，将突片E18b选择性地插入到设置于棒罩E17的插入部E17a、E17b来使检测棒E18保持于规定的位置即可。此外，作为设置于棒罩E17的插入部E17a、E17b，未必贯通棒罩E17，也可以是与突片E18b相向的部位开口的凹形的槽。

[0357] 为了以筒式供水箱方式对具有上述的结构的储液器E贮存饮用水，只要如图48所示那样，在供水管E5的比滤水器E2靠上游侧的部位连接具有辅助泵E30的辅助供水管E31，并将该辅助供水管E31与筒式的供水箱E32连接即可。在筒式供水箱方式中，从供水控制部(未图示)对上游侧的电磁供水阀E3输出控制信号以使其平时维持关闭的状态。即，在从储液器E的高水位开关E14a提供了供水开始信号的情况下，供水控制部(未图示)仅打开下游侧的电磁供水阀E4，并且通过驱动辅助泵E30来将贮存于供水箱E32的饮用水补充到储液器

主体E11。当从上述的状态起从高水位开关E14a提供了供水停止信号时，供水控制部(未图示)使辅助泵E30停止，再关闭下游侧的电磁供水阀E4。此后，重复实施上述的动作，储液器主体E11的饮用水保持为固定以上的规定水位BH1。

[0358] <氯发生器B>

[0359] 如上所述，在杯式自动售货机1中，如图56所示，使从自来水管口供给的饮用水通过滤水器E2后贮存到储液器主体E11。贮存于储液器主体E11的饮用水作为各种饮料的稀释用水、制冰用水被供给。关于搭载于杯式自动售货机1的储液器E而言，有的储液器E具备氯发生器B，该氯发生器B在机内重新对储液器主体E11中贮存的饮用水进行杀菌。不仅对来自自来水管口的饮用水利用氯发生器B，还能够对来自设置于设备壳体2的内部或外部的供水箱E32的饮用水利用氯发生器B。

[0360] 氯发生器B是对贮存于储液器主体E11的饮用水进行电解来进行氯杀菌的装置。氯发生器B的氯杀菌法是以下方法：有效利用饮用水中包含的氯离子(氯离子本身不具有杀菌能力)，通过对饮用水进行电解来使氯离子进行阳极氧化以产生氯，使该氯溶解于水中来对饮用水进行杀菌。如图57和图58所示，在氯发生器B设置有具备在储液器主体E11的水中施加直流电压的一对电极板B4a、B4a的氯发生电极B4，氯发生器B向该氯发生电极B4通电来对水进行电解。由此，如下式(BA)、(BB)所示那样，饮用水中包含的氯离子被阳极氧化后失去电子来被转化为氯，饮用水再次包含氯来具有杀菌力。

[0361] $2Cl^{-}-2e^{-}\rightarrow Cl_2$ (BA)

[0362] $Cl_2+H_2O\rightarrow HClO+HCl$ (BB)

[0363] 接着，说明具备氯发生器B的杯式自动售货机1的供水系统的结构例。如图56所示，杯式自动售货机1的供水系统具备储液器E、氯发生器B以及制冰机G。

[0364] 储液器主体E11是贮存从自来水管口经由滤水器E2供给的水的容器。储液器主体E11内的水被供给到供水线路E40和制冰机G。储液器主体E11将经由电磁供水阀E3、E4供给的水贮存到利用浮子开关E14设定的规定水位BH1为止。浮子开关E14具有高水位开关E14a和低水位开关E14b，基于这些各开关E14a、E14b的动作对电磁供水阀E3、E4进行开闭控制。当随着饮料销售而导出饮用水、由此储液器主体E11的水位下降而从高水位开关E14a输出供水开始信号时，电磁供水阀E3、E4接收供水开始信号来打开，来自自来水管口的饮用水被补给到储液器主体E11。然后，当通过饮用水的补给储液器主体E11的水位恢复从而从高水位开关E14a输出供水停止信号时，电磁供水阀E3、E4接收供水停止信号来关闭。由此，储液器主体E11保持为利用浮子开关E14设定的规定水位BH1。

[0365] 制冰机G利用从储液器E供给的饮用水来生成冰并贮存该冰，另一方面，通过冰供给通路G1来向杯W适当地供给冰。

[0366] 在供水线路E40设置有水泵E1、水冷却盘管E41以及电磁冷水阀E42。储液器主体E11内的水通过水泵E1的驱动力，在水冷却盘管E41中被冷却之后，经由电磁冷水阀E42供给到杯W。

[0367] 供水线路E40在水冷却盘管E41与电磁冷水阀E42之间连接有碳酸水供给线路E43。在碳酸水供给线路E43设置有电磁供水阀E44、碳酸化器Q以及电磁碳酸水阀E45。在供水线路E40中流通的水在电磁供水阀E44被打开的情况下供给到碳酸化器Q而成为碳酸水，并经由电磁碳酸水阀E45供给到杯W。

[0368] 氯发生器B设置于储液器主体E11内，如上述那样对储液器主体E11的贮存水进行电解来产生氯。氯发生器B具备：氯发生电极B4，其具有一对电极板B4a、B4a；直流电源B14，其对氯发生电极B4施加电压；以及通电控制部B15。

[0369] 如图57和图58所示，氯发生电极B4为以下构造：利用保持件B4b来保持隔着规定间隔的间隙以面对面的方式并排的长条形的2块电极板B4a、B4a，该规定间隔选定为数mm左右。在保持件B4b的上表面，各电极板B4a的端子B4c突出来与直流电源B14侧连接。氯发生电极B4是以使保持件B4b位于水面上、且各电极板B4a浸泡在水中的方式从上方插入到储液器主体E11内来设置的。

[0370] 氯发生器B按适当的时间周期、或者在与饮料的销售动作相配合的时刻等，在通电控制部B15的控制下从直流电源B14对氯发生电极B4通电，来在储液器主体E11的水中生成氯以对饮用水进行杀菌。

[0371] 另外，如图56所示，制冰机G一般来说为以下方式：使在其储冰室G21内产生的冰的融解水通过融水管E46返回到储液器主体E11。因此，在储液器主体E11中，当在电磁供水阀E3、E4被关闭而水位被维持为规定水位BH1的销售待机过程中来自制冰机G的融解水回流时，储液器主体E11的水位提升以与制冰机G侧的水位相平衡。其结果，存在以下情况：储液器主体E11的水位如图57所示那样上升到超过规定水位BH1的上升水位BH2。

[0372] 当储液器主体E11的水位发生变动时，随之氯发生电极B4没入水中的浸泡区域、也就是说直接参与氯发生的电极板B4a的液体接触面积发生变化。因而，当在该状态下提供氯发生信号来对氯发生电极B4通电时，与在规定水位BH1的状态下进行通电的情况相比，在相同的通电条件(施加电压、通电时间等)下，氯发生量产生差异。即，氯的产生是在电极板B4a的浸泡于水中的部分的表面进行的，因此当电极板B4a的液体接触面积改变时，与此对应地氯发生量发生变动。在该情况下，若将电极板B4a的液体接触面积设为BS、将电极板B4a、B4a的间隔设为BL、将饮用水的导电度设为BEC、将电极B4的施加电压设为BV、将通电电流设为BI，则与氯发生量BQ之间成立下式(BC)的关系。其中，Bk1、Bk2是常数。另外，若以曲线图来表示式(BC)，则如图59所示。

[0373] $BQ=(BS/BL)\times BEC\times Bk1=(BI/BV)\times Bk2$ (BC)

[0374] 另一方面，若饮用水的水中的氯浓度低，则杀菌效果下降，但是反之若氯浓度过剩，则氯味过强而有损销售饮料的风味，除此以外，还会产生着色清凉饮料的变色、构成饮用水供给系统管路的材料的劣化等问题。

[0375] 根据以上，在图57和图58所示的氯发生电极B4中，使用了宽度尺寸为BD的长条形的电极板B4a，因此随着水位的变动，电极板B4a的液体接触面积大幅变化。也就是说，在储液器主体E11的水位从规定水位BH1上升到上升水位BH2的情况下，电极板B4a的液体接触面积以$BD\times(BH2-BH1)$的比例增加。因此，也有可能产生以下问题等：氯发生量相对于储液器主体E11的储水量而言变得过剩，水中的氯浓度变高，从而饮用水的风味受氯味所损害。

[0376] 因此，接着说明以下的各变形例所涉及的结构：利用与电极板B4a不同的形状，即使在储液器主体E11的水位上升为超过规定水位BH1的情况下，也不会相对于储水量过剩地产生氯。此外，在图60～图66中，对与图57～图58的要素所对应的要素相同或类似的要素标注相同的标记。

[0377] 如图60和图61所示，第一变形例的氯发生电极B18与上述的氯发生电极B4相比，相

向的一对电极板B18a、B18a的形状不同。在电极板B18a中，以储液器主体E11的规定水位BH1为界，使电极板B18a的延伸到规定水位BH1的上侧的部分的宽度尺寸Bd比电极板的位于规定水位BH1的下侧的部分的宽度尺寸BD的宽度小。宽度尺寸Bd被设定为能够确保电极的通电所需的电流容量的程度的小宽度。只要与储液器主体E11中设想的水位上升变动幅度区域对应地形成这种电极板B18a的小宽度区域即可。

[0378] 因而，关于氯发生电极B18，即使在储液器主体E11内的水位超过规定水位BH1而上升到上升水位BH2的情况下，与规定水位BH1的状态相比，也只是宽度小的宽度尺寸Bd的部分多余地没入水中，电极板B18a的直接参与氯发生的宽度尺寸BD的部分的液体接触面积增加量很少。因此，只要使电极的施加电压、通电时间固定，那么通过对电极通电来得到的氯发生量在规定水位BH1时与上升水位BH2时之间几乎不变而为大致固定量。由此，消除了相对于储液器主体E11的储水量而言氯浓度过剩从而有损销售饮料的风味的情况。

[0379] 如图62所示，在第二变形例的氯发生电极B19中，各电极板B19a的小宽度部(宽度尺寸Bd)形成于各电极板B19a的侧端部，并且在彼此相向的一对电极板B19a、B19a之间小宽度部交错地配置于左右。也就是说，各小宽度部在电极板B19a、B19a之间设定的间隙的对角线上彼此面对面，其相互间隔实质上比电极的间隙尺寸大。因而，有效地发挥以下作用：抑制在水位上升时在水中流动的电流的增加、也就是说氯发生量的增加。

[0380] 如图63和图64所示，在第三变形例的氯发生电极B20中，以储液器主体E11的规定水位BH1为界，利用电绝缘材料B21来覆盖电极板B4a的延伸到规定水位BH1的上侧的部分的表面，该电绝缘材料B21例如通过树脂涂层等来得到。

[0381] 因而，关于氯发生电极B20，即使水位超过规定水位BH1而上升到上升水位BH2，也只是电极板B4a的被电绝缘材料B21绝缘覆盖的部分没入水中，参与氯发生的电极板B4a的液体接触面积不变。因此，氯发生量不会因水位的上升变动而增加，收敛于固定量。

[0382] 如图65和图66所示，在第四变形例的氯发生电极B22中，以储液器主体E11的规定水位BH1为界，在规定水位BH1的上方区域，在相向的一对电极板B4a、B4a之间设置有绝缘分隔壁B23。该绝缘分隔壁B23的宽度尺寸BD1选定得至少比各电极板B4a的宽度尺寸BD大，来切断相向的电极板B4a、B4a之间的水中通电路径。此外，该绝缘分隔壁B23也可以与保持件B4b一体成形。

[0383] 因而，关于氯发生电极B22，在水位超过规定水位BH1而上升到上升水位BH2的状态下，绝缘分隔壁B23的下端部没入水中，该没入水中的部分对在电极板B4a、B4a之间的水中流动的电流起障碍物的作用。由此，没入规定水位BH1与上升水位BH2之间的水中的电极板B4a的面区域几乎不直接参与氯发生，由此能够将伴随水位上升引起的氯发生量的增加抑制为很少。

[0384] <温水箱F>

[0385] 如图48所示，温水箱F利用从储液器E供给的饮用水来生成热水并贮存该热水，另一方面，温水箱F对冲泡机构L、输送到烹调位置的杯W适当地供给热水。如图67～图72所示，温水箱F由金属制材料形成，呈长方体状，设置于设备壳体2的内部的比较高处的部位。

[0386] 在该温水箱F的内部配设有加热器F1和浮子F2。加热器F1在根据来自箱控制部(未图示)的指令而被驱动的情况下对温水箱F的内部贮存的饮用水进行加热来生成热水。浮子F2随着温水箱F的水位而适当上下浮动，具备感测臂F3。感测臂F3从温水箱F的上表面突出

到外部，其突出端部以能够旋转的方式被沿水平方向延伸的支承轴F4支承于温水箱F。即，浮子F2以支承轴F4为中心进行旋转，由此在温水箱F的内部上下移动。作为浮子F2，应用由不锈钢等金属构成的浮子。

[0387] 在温水箱F的前表面配设有热水喷出单元F10和下部温度传感器F20。热水喷出单元F10具备2个热水供给阀F11、F12、喷出温度传感器F13以及溢流管F14。热水供给阀F11、F12是设置于温水箱F的热水供给口F5的电磁式的开闭阀，根据来自箱控制部(未图示)的指令，如图48所示那样，将热水供给管F11a和热水供给管F12a分别独立地开闭，该热水供给管F11a将温水箱F与烹调位置的热水喷嘴之间连接，该热水供给管F12a将温水箱F与冲泡机构L之间连接。喷出温度传感器F13对通过热水供给阀F11、F12喷出的热水的温度进行探测，将其探测信号输出到箱控制部(未图示)。溢流管F14用于使温水箱F的内部产生的水蒸气排到外部，溢流管F14从温水箱F的上部向下方延伸。在该溢流管F14的下端部设置有沸腾防止热电偶F30。沸腾防止热电偶F30是插入于加热器F1的未图示的驱动电路中、并根据通过溢流管F14的水蒸气的温度来进行动作的双金属方式的热电偶，在通过溢流管F14的水蒸气的温度超过预先设定的温度的情况下强制性地切断加热器F1的驱动电路。下部温度传感器F20对贮存于温水箱F的下部的热水的温度进行探测，将其检测温度信息输出到箱控制部(未图示)。在下部温度传感器F20的检测温度低于预先设定的温度的情况下，箱控制部(未图示)以后述的高水位开关F31和低水位开关F32均未被操作为条件，对加热器F1进行驱动以进行饮用水的加热。与此相对，在下部温度传感器F20的检测温度超过预先设定的温度的情况下，箱控制部(未图示)以后述的高水位开关F31和低水位开关F32均未被操作为条件，使加热器F1对饮用水的加热停止。

[0388] 在温水箱F的前表面的除了热水供给阀F11、F12的设置位置和下部温度传感器F20的设置位置以外的部分，设置有前部绝热材料F6。前部绝热材料F6例如是由三聚氰胺泡沫、发泡聚丙烯等树脂材料成型为薄片状而得到的。

[0389] 在上述的热水喷出单元F10中的热水供给阀F11、F12、喷出温度传感器F13及溢流管F14的配设部位处设置有前部罩F40。前部罩F40例如是由三聚氰胺泡沫等树脂材料进行成型而得到的，具有绝热性。

[0390] 在温水箱F的上表面设置有高水位开关F31、低水位开关F32、干烧防止热电偶F34。由配设于温水箱F的内部的浮子F2来操作高水位开关F31和低水位开关F32。

[0391] 即，如图72的(a)所示，当温水箱F的水位下降时，浮子F2向下方移动来位于支承轴F4的下方。此时，成为感测臂F3的顶端部对低水位开关F32进行了操作的状态，从低水位开关F32向箱控制部(未图示)输出检测信号。当从低水位开关F32输出检测信号时，箱控制部(未图示)使加热器F1停止，并且通过对储液器E的水泵E1进行驱动来对温水箱F补充饮用水。

[0392] 如图72的(b)所示，当温水箱F的水位上升时，感测臂F3以支承轴F4为中心逐渐旋转。当在温水箱F变为规定的水位的时间点感测臂F3对高水位开关F31进行了操作时，从高水位开关F31对箱控制部(未图示)输出检测信号。当从高水位开关F31输出检测信号时，箱控制部(未图示)使储液器E的水泵E1停止，来结束对温水箱F的饮用水的补充。与此同时，对加热器F1进行驱动，来对贮存于温水箱F的饮用水进行加热。干烧防止热电偶F34是根据温水箱F的内部温度来进行动作的双金属方式的热电偶，与沸腾防止热电偶F30同样地，构成

未图示的加热器F1的驱动电路。该干烧防止热电偶F34以如下方式进行动作：在温水箱F的内部温度超过预先设定的值的情况下，强制性地切断加热器F1的驱动电路。

[0393] 温水箱F的上部的整个区域被上部罩F50所覆盖。上部罩F50呈下表面开口的长方体状，例如是由三聚氰胺泡沫等树脂材料进行成型而得到的，具有绝热性。

[0394] 如图70所示，在温水箱F的左右两侧面和后表面，借助内部绝热材料F35和外部绝热材料F36来配设有真空绝热材料F37。真空绝热材料F37构成为板厚为15mm左右的平板状。内部绝热材料F35例如呈板厚为10mm左右的薄片状，由耐热性优异的三聚氰胺泡沫、发泡聚丙烯等树脂材料构成。外部绝热材料F36例如呈板厚为5mm的薄片状，用于保护真空绝热材料F37。

[0395] 如图71所示，在温水箱F的下表面也配设有例如由三聚氰胺泡沫、发泡聚丙烯等树脂材料构成的平板状的下部绝热材料F38。从温水箱F的下表面突出的喷出口F39如图67所示那样用于连接清洗用具F60。

[0396] 清洗用具F60是在利用温水箱F的热水来清洗设备壳体2的内部时使用的，在前端具备喷嘴F61，并且由在把手处具备冲洗阀(未图示)的操作杆F62的挠性管构成。在未对操作杆F62进行操作的情况下，该清洗用具F60为冲洗阀(未图示)关闭的状态，不会从前端的喷嘴F61喷出热水。当借助把手的操作杆F62来打开冲洗阀(未图示)时，原本贮存于温水箱F的热水能够从前端的喷嘴F61喷出来对设备壳体2的内部进行清洗。虽然图中未明示，但是该清洗用具F60在不使用时能够以前端部卡定于在设备壳体2的内部设置的卡定部的状态收纳。卡定部以使清洗用具F60的前端的喷嘴F61处于比温水箱F中贮存的热水的最高水位高的位置的状态来卡定清洗用具F60。因而，即使冲洗阀(未图示)发生不良状况，也不会招致在收纳状态下温水箱F的热水从清洗用具F60的喷嘴F61滴下的事态。

[0397] 在如上述那样构成的温水箱F中，如上所述，箱控制部(未图示)基于来自高水位开关F31和低水位开关F32的检测信号来适当地驱动加热器F1和储液器E的水泵E1，来在内部以使维持为期望的高温状态的热水始终保持固定以上的水位的方式贮存该热水。

[0398] 当从冲泡机构L、搅拌机构J对箱控制部(未图示)输出热水供给请求时，对相应的热水供给阀F11、F12提供指令，将所贮存的热水供给到冲泡机构L、烹调位置的杯W。

[0399] 在此，根据该温水箱F，如上述那样设置有干烧防止热电偶F34和沸腾防止热电偶F30。因而，即使在从低水位开关F32的检测信号或下部温度传感器F20的检测温度来看本来应该使加热器F1停止、但是例如由于加热器F1的驱动电路中产生的异常而加热器F1不停止的情况下，也会由于温水箱F的内部温度、水蒸气的温度上升而干烧防止热电偶F34、沸腾防止热电偶F30进行动作，来自动地切断加热器F1的驱动电路。由此，能够防止以下事态于未然：温水箱F成为过热状态。

[0400] <制冰机G>

[0401] 如图48所示，制冰机G利用从储液器E供给的饮用水来生成冰并贮存该冰，另一方面，通过冰供给通路G1来向杯W适当地供给冰。对于制冰机G，不是通过对水泵E1的驱动、而是通过适当调整储液器E的水位来从储液器主体E11供给水。下面，说明螺旋钻方式的制冰机。

[0402] 如图73所示，制冰机G具备制冰部G10、储冰部G20以及冰块滑槽G30。如图74所示，制冰部G10在制冰筒G11的内部具备螺旋钻G12。制冰筒G11是金属制的圆筒状构件，在其周

围具备制冷剂通路G13。制冷剂通路G13作为蒸发器发挥功能，如图179所示那样与压缩机N2、冷凝器N5、膨胀阀N15一起构成冷冻回路。如图73所示，在冷冻回路进行驱动的状态下向制冰筒G11的内部供给饮用水的情况下，该制冷剂通路G13对饮用水进行冷却来使饮用水在制冰筒G11的内部结冰。螺旋钻G12具有螺旋状的切削刀G12a，该切削刀G12a配设成能够以与制冰筒G11的内周面滑动接触的状态在制冰筒G11的内部旋转。螺旋钻G12经由减速机G14来与驱动电动机G15连结。该螺旋钻G12在被驱动的情况下削取结在制冰筒G11的冰，并且将所削取的片状的冰逐渐给送到上方。在上述的制冰筒G11的内部上端设置有固定刀G16。固定刀G16对由螺旋钻G12给送的片状的冰进行压缩来使该冰凝固为棒状。

[0403] 储冰部G20是有底圆筒状的绝热容器，在内部具有储冰室G21。该储冰部G20设置于制冰筒G11的上部，储冰室G21经由设置于该储冰部G20的底部的连络筒G22来与制冰筒G11的内部连通。

[0404] 在储冰室G21设置有旋转轴G23、搅拌器G24、分隔构件G25、探测板G26以及储冰量探测开关G27。旋转轴G23从螺旋钻G12的上端朝向上方突出，能够与螺旋钻G12一起旋转。搅拌器G24是从旋转轴G23呈放射状突出的多根圆柱状构件。各个搅拌器G24设置于旋转轴G23的周面的高度彼此不同的位置，并以随着去向外周而逐渐向下或向上的方式倾斜。与旋转轴G23一起旋转的搅拌器G24具有将通过螺旋钻G12而被凝固为棒状的冰折断来生成薄片状的冰片的功能，并且具有通过在储冰室G21的内部进行搅拌来防止冰片融合成大的冰块的事态的功能。

[0405] 分隔构件G25是覆盖储冰室G21的内底面的大致圆板状的构件，在中心部具有连络孔G25a，并且在作为连络孔G25a的周围的部分具有大量的排水孔(未图示)。连络孔G25a是与连络筒G22的上端开口连通的圆形的缺口，其内部被旋转轴G23所贯通。排水孔是形成为直径比连络孔G25a的直径小的圆形的孔。上述的分隔构件G25是由不锈钢等金属进行成型而得到的。探测板G26配设成在储冰室G21的上部能够上下移动。该探测板G26在通常的状态下由于自重而维持为位于下方的状态。另一方面，当储冰室G21的冰贮存到上端附近时，被冰按压的探测板G26向上方移动。储冰量探测开关G27在探测板G26向上方移动的情况下对制冰控制部(未图示)输出探测信号。当从储冰量探测开关G27输出探测信号时，冷冻回路停止，并且驱动电动机G15停止，因此冰的生成停止。

[0406] 另外，在储冰室G21，在下部周面设置有放出口G21a。放出口G21a用于将贮存于内部的冰喷出到外部。在该放出口G21a设置有开闭门G28，并且连接有冰块滑槽G30。

[0407] 开闭门G28以能够对放出口G21a进行开闭的方式设置于储冰部G20。在该开闭门G28连接有门螺线管G29。门螺线管G29在被消磁的情况下，开闭门G28被复位弹簧G29a维持为将放出口G21a关闭的状态。当门螺线管G29被励磁时，使开闭门G28抵抗复位弹簧G29a的弹性力来移动，维持为将放出口G21a打开的状态。

[0408] 冰块滑槽G30汇集从放出口G21a放出的冰来输送到下游，冰块滑槽G30与冰供给通路G1的上端部连接。在该冰块滑槽G30设置有冰定量传感器G31。冰定量传感器G31检测汇集后的冰的通过量，将检测结果输出到制冰控制部(未图示)。在制冰控制部(未图示)中，从为了打开开闭门G28而对门螺线管G29进行励磁的时间点起依次累计冰定量传感器G31的检测结果，并与预先设定的值进行比较。在累计结果变为预先设定的值的情况下，通过制冰控制部(未图示)使门螺线管G29消磁以关闭开闭门G28。其结果，对下游的杯W供给预先设定的固

定量的冰。

[0409] <杯输送机构H>

[0410] 作为杯输送机构H，例示了3轴式的杯输送机构H-1和悬挂式的杯输送机构H-2。首先说明3轴式的杯输送机构H-1。

[0411] <3轴式的杯输送机构H-1>

[0412] 3轴式的杯输送机构H-1将供给到杯供给位置的杯W经由接收位置输送到烹调位置，之后输送到面对取出口机构S的销售位置。杯输送机构H-1例如设置于设备壳体2的内部的原料供给机构D的下方。杯输送机构H-1能够进行X方向、Y方向、Z方向的3轴动作，其中，X方向是从正面看杯式自动售货机1时的左右方向，Y方向是深度方向，Z方向是高度方向。根据规格不同，也能够构成为省略了Z方向的机构的XY的2轴动作机构。如上所述，在杯输送机构H-1的下方设置有接住溢出的饮料、原料的排水托盘A10。

[0413] 如图76所示，杯输送机构H-1具备XY台H10和杯把持装置H12。首先说明XY台H10。

[0414] XY台H10具备沿X方向延伸的X轴部H14以及搭载于X轴部H14的上表面且沿Y方向延伸的Y轴部H16。能够利用X轴部H14来使Y轴部H16沿X方向移动。杯把持装置H12搭载于Y轴部H16的上表面，能够利用Y轴部H16来沿Y方向移动。

[0415] X轴部H14具备X轴罩H18、X轴输送电动机H20、X轴电动机驱动器H22、X轴驱动带轮H24、X轴从动带轮H25、X轴同步带H26、X轴调整螺丝H28、X轴原点传感器H30以及两端附近的防脱板H32。

[0416] X轴罩H18是用于搭载Y轴部H16的上表面板，从X方向看时形成平缓的圆弧面，以易于搭载、引导Y轴部H16。另外，通过X轴罩H18来保护X轴部H14内部免受污染，并且使得易于清扫。

[0417] X轴输送电动机H20是对Y轴部H16沿X方向进行驱动的步进电动机，设置于X轴部H14的内部的左端附近。X轴电动机驱动器H22是驱动X轴输送电动机H20的驱动器，与X轴输送电动机H20接近配置以提高抗噪性。

[0418] X轴驱动带轮H24设置于X轴输送电动机H20的输出轴，缠绕有X轴同步带H26，将X轴输送电动机H20的旋转运动变换为X方向的往复运动。在X轴部H14的内部的右端附近设置有X轴从动带轮H25，X轴同步带H26以几乎无松弛的方式缠绕于X轴驱动带轮H24与X轴从动带轮H25之间，其一部分固定于Y轴部H16。

[0419] X轴调整螺丝H28是进行X轴同步带H26的松紧度调整的螺丝，在维护时等利用。

[0420] X轴原点传感器H30是用于检测X轴的原点位置的可见光截止型的传感器。在本实施方式中，作为X轴原点传感器H30，使用防尘型的光遮断器，耐污染、耐经年变化。

[0421] 防脱板H32是Y轴部H16的防脱件，设定于设备壳体2内部的必要动作范围两端。

[0422] 关于X轴部H14，X轴输送电动机H20的旋转运动经由X轴驱动带轮H24被传递到X轴同步带H26，通过X轴同步带H26的环状旋转，Y轴部H16朝向X方向上的各停止位置移动。通过X轴输送电动机H20的脉冲计数旋转数控制来决定到各停止位置为止的移动距离。

[0423] X轴部H14在每次销售结束时使Y轴部H16朝向X轴待机位置移动，在由X轴原点传感器H30探测出Y轴部H16已到达X轴待机位置的时间点使X轴输送电动机H20停止。X轴待机位置例如是X轴部H14的最右侧。

[0424] Y轴部H16具备Y轴罩H34、Y轴输送电动机H36、Y轴电动机驱动器H38、Y轴驱动带轮

H40、Y轴从动带轮H41、Y轴同步带H42、Y轴调整螺丝H44、Y轴原点传感器H46、两端附近的防脱板H48以及Y轴锁定螺线管H50。

[0425] Y轴罩H34是用于搭载杯把持装置H12的上表面板，从Y方向看时形成平缓的圆弧面，易于搭载、引导杯把持装置H12。另外，通过Y轴罩H34来保护Y轴部H16内部免受污染，并且使得易于清扫。

[0426] Y轴输送电动机H36是对Y轴部H16沿Y方向进行驱动的步进电动机，设置于Y轴部H16的内部的后端附近。Y轴电动机驱动器H38是驱动Y轴输送电动机H36的驱动器，与Y轴输送电动机H36接近配置以提高抗噪性。

[0427] Y轴驱动带轮H40设置于Y轴输送电动机H36的输出轴，缠绕有Y轴同步带H42，将Y轴输送电动机H36的旋转运动变换为Y方向的往复运动。在Y轴部H16的内部的前端附近设置有Y轴从动带轮H41，Y轴同步带H42以几乎无松弛的方式缠绕于Y轴驱动带轮H40与Y轴从动带轮H41之间，其一部分固定于杯把持装置H12。

[0428] Y轴调整螺丝H44是进行Y轴同步带H42的松紧度调整的螺丝，在维护时等利用。

[0429] Y轴原点传感器H46是用于检测Y轴的原点位置的可见光截止型的传感器。在本实施方式中，作为Y轴原点传感器H46，使用防尘型的光遮断器，耐污染、耐经年变化。

[0430] 防脱板H48是杯把持装置H12的防脱件，设定于设备壳体2内部的必要动作范围两端。防脱板H48的承受载荷比较小即可，被设定为比防脱板H32小。

[0431] Y轴锁定螺线管H50是用于通过将Y轴同步带H42的一部分固定来锁定杯把持装置H12的Y方向位置的螺线管。根据Y轴锁定螺线管H50的锁定功能，即使在杯把持装置H12配置于取出口机构S(参照图195)的保持架S14内后取出口门S10被打开、使用者将手伸入保持架S14内来与杯W或杯把持装置H12的一部分接触由此沿Y方向施加力，也能够限制杯把持装置H12的位移，能够稳定地载置杯W。另外，如上所述，杯把持装置H12在保持架S14内通过突出片S30(参照图197)来在X方向上也被固定，因此结果是杯把持装置H12在X方向和Y方向上被固定。

[0432] 关于Y轴部H16，Y轴输送电动机H36的旋转运动经由Y轴驱动带轮H40被传递到Y轴同步带H42，通过Y轴同步带H42的环状旋转，杯把持装置H12朝向Y方向上的各停止位置移动。通过Y轴输送电动机H36的脉冲计数旋转数控制来决定到各停止位置为止的移动距离。

[0433] Y轴部H16在每次销售结束时使杯把持装置H12朝向Y轴待机位置移动，在由Y轴原点传感器H46探测出杯把持装置H12已到达Y轴待机位置的时间点使Y轴输送电动机H36停止。Y轴待机位置例如是Y轴部H16上的最里侧。

[0434] 杯把持装置H12具备把持杯W的功能以及Z轴动作功能。该Z轴动作能够根据杯W的尺寸来进行2级以上的位移，Z轴动作范围比XY台H10的动作范围小。

[0435] 如图77所示，杯把持装置H12以作为机构收容部的外壳H160为基体而构成，具有从外壳H160的下方部朝向前方(正面方向)水平地突出的台H181、从外壳H160的中央部向前方突出的一对杯挡板H182L、H182R以及突出到外壳H160的下部两侧方的一对引导片H183。在图77中，一个引导片H183隐藏于外壳H160的后侧，与暴露在前侧的引导片H183左右对称。

[0436] 台H181是接住从杯供给机构C供给的杯W的杯接收台。台H181呈格子状地设置有多个孔，以避免溢出的饮料等积存。

[0437] 在台H181与杯挡板H182L、H182R之间确保有Y方向的间隙。在进入到后述的取出口

机构S的保持架S14内时(参照图197)，取出口杯探测传感器S24a、S24b的光轴穿过该台H181与杯挡板H182L、H182R之间的间隙，探测杯W的有无。

[0438] 引导片H183是夹持Y轴部H16的两侧、并且从Y轴部H16被传递驱动力的部分。引导片H183被Y轴部H16驱动，由此杯把持装置H12的整体沿Y方向移动。另外，左右的引导片H183的X方向宽度被设定成比取出口机构S中的一对突出片S30的内宽稍小。因而，当杯把持装置H12向前方移动而台H181被配置于取出口机构S的保持架S14内时，左右的引导片H183进入一对突出片S30之间。由此，即使使用者沿X方向对杯W和杯输送机构H-1施加力，由于引导片H183与突出片S30抵接，因此杯把持装置H12的位移也被限制，从而稳定地载置杯W。

[0439] 如图77和图78所示，在杯把持装置H12的外壳H160具备Z轴驱动电动机H184、Z轴原点开关H185、Z轴位置检测开关H186、Z轴引导件H187以及一对H轴驱动臂H188。

[0440] 一对杯挡板H182L、H182R从两侧支承由台H181接住的杯W，分别以能够开闭的方式被H轴驱动臂H188支承。将该开闭方向设为H方向。

[0441] Z轴驱动电动机H184是使台H181沿上下方向(Z方向)移动的电动机。杯挡板H182L、H182R与台H181一体地上下移动。Z轴原点开关H185是检测台H181的Z轴原点位置的开关。在本实施方式中，作为Z轴原点开关H185，使用防尘型的光遮断器，耐污染、耐经年变化。Z轴位置检测开关H186是阶梯式地检测台H181的Z方向位置的开关。Z轴引导件H187沿Z方向引导台H181来使其位置和姿势稳定。一对H轴驱动臂H188在X方向上接近地排列，是使杯挡板H182L、H182R开闭的轴。杯挡板H182L、H182R能够相对于H轴驱动臂H188拆下和更换。

[0442] 此外，在杯式自动售货机1中利用的杯W的高度为1个种类的情况下，也可以省略Z轴驱动电动机H184等与Z轴动作有关的结构要素。

[0443] 在杯把持装置H12中，Z轴驱动电动机H184的旋转运动传递到台H181，台H181朝向各停止位置沿Z方向升降。由Z轴位置检测开关H186来探测到各停止位置为止的移动距离。在销售结束时等台H181下降到下侧的待机位置时，利用Z轴原点开关H185探测出该情况，在该时间点使Z轴驱动电动机H184停止。

[0444] 接着，说明一对杯挡板H182L、H182R及其周边要素。如图79所示，从正面看时的左侧的杯挡板H182L具有轴部H182L1、设置于轴部H182L1的上端部的齿轮部H182L2、从轴部H182L1的中间向前方延伸的挡板臂部H182L3、设置成与挡板臂部H182L3相连且形成为下侧呈缩窄的半圆筒形的杯把持部H182L4、设置成与杯把持部H182L4相连且朝向左斜前方延伸的挡板部H182L5、从轴部H182L1的中间稍下方朝向右斜后方延伸的臂部H182L6。

[0445] 如图80所示，从正面看时的右侧的杯挡板H182R与左侧的杯挡板H182L同样地，具有轴部H182R1、设置于轴部H182R1的上端部的齿轮部H182R2、从轴部H182R1的中间向前方延伸的挡板臂部H182R3、设置成与挡板臂部H182R3相连且形成为下侧呈缩窄的半圆筒形的杯把持部H182R4、设置成与杯把持部H182R4相连且朝向右斜前方延伸的挡板部H182R5、从轴部H182R1的中间稍下方朝向左斜后方延伸的臂部H182R6。

[0446] 左侧的杯挡板H182L的轴部H182L1和右侧的杯挡板H182R的轴部H182R1以能够旋转的方式支承于外壳H160，齿轮部H182L2、H182R2相互啮合。因而，当打开左侧的杯挡板H182L(使其沿图79中的顺时针方向旋转)时，右侧的杯挡板H182R也会打开(沿图80中的逆时针方向旋转)，当打开右侧的杯挡板H182R时左侧的杯挡板H182L也会打开。

[0447] 如图78所示，在左侧的杯挡板H182L的臂部H182L6与右侧的杯挡板H182R的臂部

H182R6之间，架设有弹簧(拉伸螺旋弹簧)H189，利用弹簧H189的弹性恢复力，左侧的杯挡板H182L和右侧的杯挡板H182R关闭。

[0448] 如图79和图80所示，在左侧的杯挡板H182L的杯把持部H182L4的内周面和右侧的杯挡板H182R的杯把持部H182R4的内周面，设置有沿高度方向延伸的多个肋H182L7、H182R7(在图79和图80所示的杯挡板H182L、H182R分别各设置有两个)。肋H182L7、H182R7以小面积来支承供给到杯挡板H182L、H182R的杯W，以避免杯把持部H182L4、H182R4的内周面会与杯W的杯身部接触，从而即使在由于某种原因而饮料附着于杯把持部H182L4、H182R4的内周面的情况下，杯W也不会被污染。通过设置例如总共4个肋H182L7、H182R7，对杯W进行4点支承来确保输送的稳定性。

[0449] 如图79所示，在左侧的杯挡板H182L的挡板臂部H182L3设置有上下一对方孔H182L3a，以能够装卸的方式安装有配件H190。

[0450] 如图80所示，在右侧的杯挡板H182R的挡板臂部H182R3除了设置有上下一对方孔H182R3a以外，还在方孔H182R3a与方孔H182R3a之间设置有方孔H182R3b，以能够装卸的方式安装有配件H190。

[0451] 配件H190是上下对称的，在一端部和另一端部设置有爪部H190a，在爪部H190a与爪部H190a之间设置有凸部H190b。

[0452] 配件H190如上述那样能够安装于左侧的杯挡板H182L的挡板臂部H182L3和右侧的杯挡板H182R的挡板臂部H182R3。如图79所示，在将配件H190安装于左侧的杯挡板H182L的挡板臂部H182L3的情况下，凸部H190b撞上挡板臂部H182L3，决定了配件H190的突出量。另一方面，如图80所示，在将配件H190安装于右侧的杯挡板H182R的挡板臂部H182R3的情况下，凸部H190b插入到方孔H182R3b，决定了配件H190的突出量。因而，配件H190在安装于左侧的杯挡板H182L的情况下突出量大，在安装于右侧的杯挡板H182R的情况下突出量小。这意味着，在将配件H190安装于左侧的杯挡板H182L的情况下杯挡板的开度大，适于把持杯身周长大的杯W。并意味着，在将配件H190安装于右侧的杯挡板H182R的情况下杯挡板的开度小，适于把持杯身周长小的杯W。

[0453] <悬挂式的杯输送机构H-2>

[0454] 接着，参照图81、图82、图83以及图84来说明悬挂式的杯输送机构H-2。该悬挂式杯输送机构H-2例如搭载于被分类为超小型的杯式自动售货机1。在被分类为超小型的杯式自动售货机1中，为以下结构：与杯供给机构C、原料供给机构D、搅拌机构J以及取出口机构S对应的杯W的位置沿X方向(左右方向)配置为直线状，不需要Y方向(深度方向)的移动。另外，杯W的尺寸限定为一个种类，也不需要与尺寸相应的Z方向(高度方向)的移动，因此杯输送机构H-2为简便的1轴(X轴)移动机构。

[0455] 杯输送机构H-2是使杯把持装置H201沿X方向移动的机构。杯把持装置H201是在杯供给机构C正下方的杯接收位置接收从杯供给机构C供给的杯W来保持该杯W的机构，相当于上述的杯把持装置H12(参照图77)。但是，省略了Z轴驱动电动机H184等与Z轴动作有关的结构要素。

[0456] 取出口机构S(参照图84)是使用者取出杯W的地方，是在设置于前表面门3的中央的框体处安装有取出口门S10的简便构造。取出口机构S相当于上述的取出口机构S(参照图194)，但是省略了背侧的保持架S14，能够从X方向进入取出口机构S。

[0457] 图81是表示杯把持装置H201被配置(输送)到杯供给机构C正下方的杯接收位置(待机位置)的状态的立体图,图82是表示输送杯把持装置H201的杯输送机构H-2的立体图。

[0458] 杯输送机构H-2具有杯把持装置H201和轨道H202。轨道H202在设备壳体2的大致整个内部宽度上沿X方向延伸,根据销售准备工序,通过未图示的下表面的滑动体来使杯把持装置H201沿X方向依次移动。杯把持装置H201相对于滑动体固定为悬挂式,接收从杯供给机构C供给的杯W并保持该杯W。杯把持装置H201具备用于接收从杯供给机构C供给的杯W并载置该杯W的台H181以及用于把持所接收的杯W的侧壁的杯挡板H182L、H182R。台H181和杯挡板H182L、H182R与上述的杯把持装置H12(参照图77)中的台H181和杯挡板H182L、H182R基本相同。

[0459] 杯把持装置H201的杯挡板H182L、H182R和台H181配置于比轨道H202靠下侧且靠前方的位置,能够针对杯供给机构C、原料供给机构D、搅拌机构J以及取出口机构S适当配置所把持的杯W。

[0460] 轨道H202在端部具有杯输送电动机H203,当通过控制部R对杯输送电动机H203进行驱动时,借助未图示的同步带和滑动体来沿X方向输送杯把持装置H201以使杯把持装置H201移动。

[0461] 在该杯输送机构H-2设置有粉末托盘H204。粉末托盘H204是用于接住从原料供给机构D向杯W供给粉末原料时的飞沫粉、将搅拌机构J的搅拌桨J10放入到杯W后进行旋转来进行搅拌时的饮料飞沫等以防止设备壳体2内部的污染的接收容器。在粉末托盘H204设置有将在杯供给机构C内呈悬空状态的杯W废弃到废弃杯容器H205的杯废弃洞H204a、杯废弃洞H204a的洞缘H204b。并且,设置有从冲泡机构L排出的提取渣等所投入的盛渣容器H208。

[0462] 图83是表示对从杯供给机构C供给到杯把持装置H201的杯W进行探测并将杯探测信号输出到控制部R的一对杯探测传感器H206的配设位置的图。如该图所示,杯探测传感器H206是由发光元件H206a和受光元件H206b构成的光电探测传感器,当从发光元件H206a放出的光被从杯供给机构C供给/落下的杯W遮挡时,控制部R能够获知杯W被供给到杯把持装置H201。发光元件H206a安装于设备壳体2的左侧壁内表面,受光元件H206b安装于设备壳体2的右侧壁内表面。

[0463] 发光元件H206a及受光元件H206b的高度被设定在台H181与杯挡板H182L、H182R之间,光轴不会被杯W以外之物所遮挡,能够不受台H181和杯挡板H182L、H182R所影响地仅探测杯W。

[0464] 杯探测传感器H206相当于上述的取出口杯探测传感器S24a、S24b(参照图195),但是安装位置不同。在上述的取出口杯探测传感器S24a、S24b中,仅探测出杯W被运入到取出口机构S内,与此相对,在杯探测传感器H206中,能够探测出杯W被运入到取出口机构S内、并且能够探测出从杯供给机构C对杯把持装置H201适当地供给了杯W,很合理。

[0465] 当在杯把持装置H201配置于杯供给机构C正下方的杯接收位置以外的位置(例如,粉末原料接收位置)时杯供给机构C使杯W落下到废弃杯容器H205时,杯探测传感器H206也能够探测该落下动作。

[0466] 在这种结构中,使用图84的表示杯供给机构C、杯把持装置H201、原料供给机构D、搅拌机构J、取出口机构S的立体图来简单说明控制部R对杯式自动售货机1的杯输送控制。

[0467] 杯把持装置H201预先配置于杯供给机构C正下方的待机位置、也就是说杯接收位

置。通过使待机位置与杯接收位置为相同位置，能够缩短销售准备时间。当由杯式自动售货机1的使用者对操作输入部U1进行操作来从控制部R向杯供给机构C提供杯供给指令时，驱动装置C40被驱动来从杯供给机构C供给杯W。当从杯供给机构C供给的杯W落下到杯把持装置H201时，杯探测传感器H206探测出杯W，杯探测信号被提供到控制部R。

[0468] 控制部R当在向杯供给机构C输出杯供给指令后在规定时间以内从杯探测传感器H206接收到杯探测信号时，识别为从杯供给机构C供给的杯W被保持于杯把持装置H201。之后，控制部R对杯输送电动机H203通电来使杯把持装置H201依次移动到原料供给机构D、搅拌机构J的各配设位置以在杯W内烹调饮料，并输送至取出口机构S。当装有饮料的杯W被输送至取出口机构S、且使用者打开取出口机构S的取出口门S10来取出装有烹调后的饮料的杯W时，来自杯探测传感器H206的杯探测信号停止。由此，杯把持装置H201被杯输送机构H-2输送到待机位置后停止，杯式自动售货机1变为销售待机状态。

[0469] 另外，在从杯供给机构C的销售杯列WK向杯把持装置H201落下/供给杯W时，可能产生以下事态：由于静电的影响，杯W留在杯供给机构C内而成为悬空状态，不落下至杯把持装置H201。在该情况下，不在规定时间内从杯探测传感器H206供给杯探测信号，因此控制部R识别出杯W未供给到杯把持装置H201。

[0470] 在该情况下，控制部R首先使杯把持装置H201移动到杯供给机构C正下方的待机位置以外的位置(例如，粉末原料接收位置)。

[0471] 然后，控制部R再次向杯供给机构C输出杯供给指令，再次从销售杯列WK使杯W落下。由此，在上一次被放出后在杯供给机构C处悬空的杯W之上落下新的另一个杯W，由于其冲击和2个杯W的自重，悬空状态被消除，2个杯W落下到废弃杯容器H205。此时，2个杯W仅在短时间内遮断发光元件H206a与受光元件H206b的光轴，因此控制部R能够根据杯探测传感器H206的检测信号来识别出适当地排出了2个杯W。此外，杯探测传感器H206既可以与上述的杯落下探测传感器C38共用，也可以与杯落下探测传感器C38相分别地设置。

[0472] 另一方面，从杯供给机构C排出的2个杯W有可能搭在杯废弃洞H204a的洞缘H204b而停留。控制部R能够在使杯把持装置H201向待机位置移动时使杯把持装置H201在待机位置的跟前阶段性地减速，由此将搭在洞缘H204b的杯W适当地引导到杯废弃洞H204a来废弃。另外，控制部R也能够通过在使杯把持装置H201向待机位置时使杯把持装置H201在待机位置的跟前暂时停止，来将搭在洞缘H204b的杯W适当地引导到杯废弃洞H204a来废弃。并且，控制部R还能够通过在使杯把持装置H201向待机位置移动时使杯把持装置H201在待机位置的跟前暂时停止和反转移动、然后再次向待机位置移动，来将搭在洞缘H204b的杯W适当地引导到杯废弃洞H204a来废弃。

[0473] 通过这种操作，即使杯W搭在洞缘H204b，也能够适当地废弃杯W而不会产生将杯W压瘪等不良状况。

[0474] <搅拌机构J>

[0475] <搅拌机构J-1>

[0476] 如图85所示，搅拌机构J-1具有搅拌桨J10、搅拌桨旋转电动机J11以及搅拌桨升降电动机J12。另外，搅拌机构J-1具有待机高度检测开关(微动开关)J13、搅拌高度检测传感器(光传感器)J14、搅拌桨上下引导件J15、热水喷嘴J16、咖啡供给喷嘴J17以及叶茶供给喷嘴J18。在搅拌机构J-1设置有未图示的冰供给部。

[0477] 搅拌桨J10用于对杯W内的饮料进行搅拌，安装于搅拌桨旋转电动机J11的驱动轴J10a的下端，当使搅拌桨旋转电动机J11旋转时，搅拌桨J10旋转。搅拌桨J10发挥良好的饮料搅拌性能，并且呈防止搅拌时的饮料飞散的形状。

[0478] 搅拌桨升降电动机J12用于使搅拌桨J10与搅拌桨旋转电动机J11一起相对于设备壳体2升降。具体地说明，搅拌桨升降电动机J12安装于设备壳体2，以如下方式发挥功能：通过进行旋转来使搅拌桨J10与搅拌桨旋转电动机J11一起从待机高度下降到搅拌高度、从搅拌高度上升到待机高度。

[0479] 当搅拌桨J10下降而移动到搅拌高度时，搅拌高度检测传感器J14开启。当搅拌桨J10上升而移动到待机高度时，待机高度检测开关J13接通。待机高度检测开关J13兼用于进行搅拌桨J10的原点位置的检测。

[0480] 搅拌桨上下引导件J15进行使搅拌桨J10和搅拌桨旋转电动机J11以位置/姿势稳定的方式上下移动的引导。

[0481] 热水喷嘴J16经由热水供给管F11a来与温水箱F连接，具有向杯W供给热水的功能以及向搅拌桨J10供给热水来进行清洗的功能。热水喷嘴J16设置于比搅拌桨J10稍高的位置，不仅能够清洗搅拌桨J10，还能够清洗驱动轴J10a。

[0482] 咖啡供给喷嘴J17及叶茶供给喷嘴J18与冲泡机构L连接，能够向杯W供给咖啡、叶茶。

[0483] 在搅拌机构J-1的正下方，通过杯把持装置H12来配置杯W，能够插入搅拌桨J10，并且能够供给热水、冰、咖啡、叶茶(以及根据规格还能够供给冷水)，搅拌机构J-1的正下方被用作进行饮料的烹调的烹调位置。

[0484] 搅拌机构J-1的基本动作如下。

[0485] 即，在销售待机状态下，使搅拌桨J10停止于待机高度以使得待机高度检测开关J13接通。然后，当杯W被运入到烹调位置时通过搅拌桨升降电动机J12使搅拌桨J10下降，在搅拌高度检测传感器J14开启的时刻使搅拌桨J10停止。在与饮料的种类相应地向杯W注入热水、冰、咖啡、叶茶之后，通过搅拌桨旋转电动机J11使搅拌桨J10旋转来进行饮料的烹调。能够通过搅拌控制部(未图示)的设定来任意地调整此时的搅拌桨旋转电动机J11的转速和旋转时间。

[0486] 之后，使搅拌桨升降电动机J12反转来使搅拌桨J10上升，并且利用从热水喷嘴J16放出的热水来进行搅拌桨J10的清洗。然后，在待机高度检测开关J13变为接通的时刻使搅拌桨升降电动机J12停止。也可以是，在将杯W从烹调位置移动之后，使搅拌桨J10和驱动轴J10a下降并施加热水来进行清洗。可以是，在热饮料的情况下，随着搅拌桨J10的上升进行热水清洗，将清洗热水注入杯W内，在冷饮料的情况下，使搅拌桨J10暂时上升并使杯W退避之后，使搅拌桨J10下降来进行清洗，使清洗热水排出。

[0487] 进一步详细地说明搅拌机构J-1的动作。

[0488] 在杯W从滑槽D20接收了粉末原料的情况下，搅拌桨J10下降并且旋转，进行搅拌以避免粉末原料溶解不完全。然后，当向杯W注入了热水、普通咖啡、叶茶等时，杯输送机构H-1(参照图76)使杯W移动到作为销售位置的取出口机构S。

[0489] 在要销售的饮料是叶茶并加砂糖或加奶油的情况下，在使杯把持装置H12(参照图77)移动到烹调位置之前，使搅拌桨J10下降，并且开放热水阀，由此冲洗搅拌桨J10。

[0490] 具体地说，搅拌桨升降电动机J12被驱动，使搅拌桨J10下降，并且开放热水阀。于是，搅拌桨J10下降并且从热水供给管F11a被施加热水(粉末热水)，从而被冲洗。然后，当经过预先设定的时间时，热水阀被封闭。之后，搅拌桨升降电动机J12被驱动，搅拌桨J10上升。然后，当待机高度检测开关J13变为接通时停止搅拌桨升降电动机J12。

[0491] 在要销售的饮料是加砂糖的饮料的情况下，通过对收容有砂糖的罐D10的螺杆电动机D31进行驱动，来从罐D10向滑槽D20放出砂糖。然后，所放出的砂糖被暂时收容于滑槽D20。

[0492] 同样地，在要销售的饮料是加奶油的饮料的情况下，通过对收容有奶油粉的罐D10的螺杆电动机D31进行驱动，来从罐D10向滑槽D20放出奶油粉。所放出的奶油粉被暂时收容于滑槽D20。

[0493] 在要销售的饮料是普通咖啡的情况下，通过对收容有作为普通咖啡的原料的咖啡豆的罐D10的螺杆电动机D31进行驱动，来从罐D10向研磨机K供给咖啡豆。供给到研磨机K的咖啡豆在滑槽D20内被螺旋钻螺杆D19送向研磨刀，由此被粉碎而成为豆末。成为豆末的咖啡豆被供给到冲泡机构L(参照图98)并注入从温水箱F供给的热水，由此提取普通咖啡。

[0494] 在要销售的饮料是叶茶的情况下，通过对收容有茶叶的罐D10的螺杆电动机D31进行驱动，来从罐D10向研磨机K供给茶叶。供给到研磨机K的茶叶在滑槽D20内被螺旋钻螺杆D19送向研磨刀，由此被粉碎。粉碎后的茶叶被供给到叶茶冲泡机并注入从温水箱F供给的热水，由此提取叶茶。

[0495] 当确定了要销售的饮料时，杯输送机构H-1通过驱动XY台H10来使杯把持装置H12从规定的待机位置移动到杯供给位置。当杯把持装置H12移动到杯供给位置时，杯供给机构C将杯W供给到杯把持装置H12。

[0496] 然后，在要销售的饮料是加砂糖的饮料的情况下，使杯把持装置H12移动到接收砂糖的接收位置(暂时收容砂糖的滑槽D20的下方)，由此杯把持装置H12的外壳H160使选择杆D53的杆部D53a向后方(在图40中为向右侧)移动。其结果，闸门D22被开放，从滑槽D20向杯W放出砂糖。

[0497] 在要销售的饮料是加奶油的饮料的情况下，只要使杯把持装置H12移动到接收奶油的接收位置(暂时收容奶油的滑槽D20的下方)，那么同样地，闸门D22被开放，从滑槽D20向杯W放出奶油。

[0498] 在要销售的饮料是普通咖啡的情况下，接着，使杯把持装置H12移动到烹调位置，将普通咖啡注入杯W。在要销售的普通咖啡加砂糖或加奶油的情况下，使搅拌桨J10下降并且旋转，来对普通咖啡进行搅拌，由此避免砂糖、奶油溶解不完全。

[0499] 在要销售的饮料是叶茶的情况下，接着，使杯把持装置H12移动到烹调位置，将叶茶注入杯W。在要销售的叶茶加砂糖或加奶油的情况下，使搅拌桨J10下降并且旋转，来对叶茶进行搅拌，由此避免砂糖、奶油溶解不完全。

[0500] 当向杯W注入了饮料时，杯输送机构H-1通过对XY台H10进行驱动来使杯把持装置H12从烹调位置移动到销售位置。

[0501] 如果杯把持装置H12移动至取出口机构S(参照图195)，则通过开放取出口门S10，能够将注入有饮料的杯W取出到机外。

[0502] <搅拌机构J-2>

[0503] 接着，参照图86和图87来说明变形例所涉及的搅拌机构J-2。在搅拌机构J-2中对与上述的搅拌机构J-1相同的结构要素标注相同标记，省略其详细说明。

[0504] 如图86和图87所示，变形例所涉及的搅拌机构J-2具备搅拌桨J10、搅拌桨旋转电动机J11、搅拌桨升降电动机J12、待机高度检测开关J13、搅拌高度检测传感器J14、搅拌桨上下引导件J15、热水喷嘴J16、咖啡供给喷嘴J17。

[0505] 另外，搅拌机构J-2具备罩J19。罩J19覆盖搅拌桨旋转电动机J11、搅拌桨升降电动机J12、待机高度检测开关J13、搅拌高度检测传感器J14、搅拌桨上下引导件J15，以保护这些机构免受污染。在搅拌机构J-2设置有冰块导入滑槽J20。冰块导入滑槽J20与制冰机G的冰供给通路G1连接。虽然图中未明示，但是在冰块导入滑槽J20中，冰所接触的部分为波浪形状，以防止冰的堵塞。

[0506] 在搅拌机构J-2的正下方的烹调位置，能够插入搅拌桨J10并且能够供给热水、冰、咖啡、叶茶(以及根据规格还能够供给冷水)，从而进行饮料的烹调。

[0507] <研磨机K>

[0508] 图88、图89和图90示出了作为咖啡等提取原料的粉碎装置的研磨机K。该研磨机K内置于杯式自动售货机1、饮料分配器等，在提取咖啡时，将作为其原料的咖啡豆按每1杯咖啡的量分别进行粉碎，来生成咖啡粉(粉原料)。

[0509] 如图88和图90所示，该研磨机K在中央部具有对咖啡豆进行粉碎的研磨机主体部K2，在其后侧配置有对研磨机主体部K2进行驱动的电动机K3，在前侧配置有将从研磨机主体部K2送出的咖啡粉供给到下方的冲泡机L1(参照图98)的粉原料供给部K4。此外，研磨机K的构成其外壳的外壳K1是将多个外壳部件相互组装而构成的，上述的研磨机主体部K2和电动机K3适当地组装于外壳K1。另外，设置于粉原料供给部K4的左端部的圆筒部K4a构成为将外壳K1的内外连通，例如用于将粉碎咖啡豆时产生的咖啡粉的气味放出到外部。

[0510] 图91示出了研磨机K的内部构造。如该图所示，研磨机主体部K2具有：不动研磨部K6，其以上半部突出到外壳K1的上方的状态组装于外壳K1，在研磨机K工作时不动；以及旋转研磨部K7，其内置于外壳K1，在研磨机K工作时旋转。

[0511] 如图92所示，不动研磨部K6具有：料斗K11，其形成为沿上下方向延伸的圆筒状，接收从上方投入的咖啡豆；粗碎环K12，其螺纹固定于该料斗K11内的下部，用于将咖啡豆粉碎为比较粗的状态(以下称为“粗碎”)；以及上侧细碎环K13，其螺纹固定于该粗碎环K12的下表面，用于与旋转研磨部K7的后述的下侧细碎环K25协作来将粗碎得到的咖啡豆粉碎为更细的状态(以下称为“细碎”)。

[0512] 料斗K11由塑料的成形品构成，在其外周面，在比上下方向的中央高少许的位置设置有齿轮部K14。另外，在料斗K11的外周面的下半部形成有外螺纹部K15，在将该外螺纹部K15拧入的状态下，料斗K11被安装于外壳K1。因而，如图88等所示，通过将具有与齿轮部K14啮合的蜗轮K10a的粒度调整螺丝K10适当转动，不动研磨部K6相对于外壳K1一边以转动的方式移动一边进行升降，来调整不动研磨部K6的上侧细碎环K13与旋转研磨部K7的下侧细碎环K25之间的间隙。由此，能够简单地调整由上侧细碎环K13和下侧细碎环K25细碎得到的咖啡豆的粒度。

[0513] 粗碎环K12由规定的金属(例如铝或其合金)构成，形成为周壁比较厚的圆筒状。在该粗碎环K12的底部设置有粉碎凸部K18，该粉碎凸部K18在粗碎环K12的整个周向上延伸，

并且向内侧突出，与后述的原料送料器K21协作来对咖啡豆进行粗碎。该粉碎凸部K18构成为以与原料送料器K21之间相隔比咖啡豆的粒径小的规定的间隔的状态突出。

[0514] 另外，粉碎凸部K18具有规定的厚度，其上表面K18a形成为沿着与沿上下方向延伸的原料送料器K21正交的平面，与该上表面K18a相连且与原料送料器K21相向的前端面K18b同上表面K18a形成呈直角的角部。除此以外，在粉碎凸部K18，沿着其周向设置有形成为凹状的多个(在本实施方式中为12个)凹部K18c。如图90和图92所示，各凹部K18c形成为在粉碎凸部K18的上表面K18a与前端面K18b之间敞开。

[0515] 另外，在粗碎环K12的内表面，在粉碎凸部K18的上方沿着周向形成有多个(在本实施方式中为12个)凹部K19。如图90和图92所示，各凹部K19形成为从粗碎环K12的上表面起至内表面敞开，各凹部K19的内表面由三角形状的三角面K19a和圆弧面K19b构成，该三角面K19a形成为大致沿着粗碎环K12的径向，该圆弧面K19b与该三角面K19a相连，形成为沿逆时针方向呈圆弧状地延伸。

[0516] 如后述那样，在粉碎咖啡豆时，原料送料器K21沿逆时针方向旋转，由此，原料送料器K21的周围的咖啡豆以与原料送料器K21同样地沿逆时针方向转动的方式移动，但是咖啡豆会与上述凹部K19(三角面K19a)、粉碎凸部K18的凹部K18c的内表面碰撞，由此能够抑制咖啡豆在周向上的移动、滑移。由此，能够高效地通过原料送料器K21将咖啡豆送到下方，并且能够高效地进行粗碎。

[0517] 上侧细碎环K13由规定的金属(例如不锈钢)构成，形成为与下侧细碎环K25呈上下对称。该上侧细碎环K13具有比粗碎环K12的粉碎凸部K18的内径大少许的内径，并且具有比粗碎环K12的外径大少许的外径。另外，上侧细碎环K13形成为从内侧去向外侧而厚度逐渐变厚，在倾斜的下表面的粉碎面K13a形成有分别沿径向延伸并且沿着周向配置的大量的刀(未图示)。

[0518] 图93的(a)表示旋转研磨部K7及其周围，图93的(b)仅示出了旋转研磨部K7，图94将图93的(a)的要素进行分解来表示。如这些图和图91所示，旋转研磨部K7具有：原料送料器K21，其沿上下方向延伸，将投入到料斗K11的咖啡豆送到下方；研磨机齿轮K23，其固定于原料送料器K21的旋转轴K22的下部；粉原料收集/喷出板K24(粉原料收集/喷出部)，其固定于旋转轴K22的研磨机齿轮K23的上方；以及下侧细碎环K25(旋转粉碎部)，其螺纹固定于该粉原料收集/喷出板K24上。

[0519] 原料送料器K21由规定的金属(例如铝或其合金)构成，具有旋转部K21a和螺旋凸部K21b，该旋转部K21a形成为沿上下方向延伸规定长度的圆筒状，该螺旋凸部K21b从该旋转部K21a的外周面突出规定长度，以从旋转部K21a的上端部沿顺时针方向转1周到下端部的方式呈螺旋状地延伸。而且，该原料送料器K21通过以下方式固定于旋转轴K22：沿上下方向延伸的旋转轴K22从下方插入到旋转部K21a，在从该旋转部K21a的上端向上方突出的旋转轴K22的上端部使螺母K21c螺纹结合来紧固。此外，旋转轴K22在其下端部和比上下方向的中央靠下侧少许的位置通过固定于外壳K1内的轴承K22a、K22a被旋转自如地支承。

[0520] 研磨机齿轮K23由具有比较大的直径的斜齿轮构成，如图91所示，研磨机齿轮K23固定于旋转轴K22的上下的轴承K22a、K22a之间。另外，研磨机齿轮K23与中间齿轮K32啮合，该中间齿轮K32与固定于电动机K3的输出轴的驱动齿轮K31啮合。驱动单元由电动机K3、驱动齿轮K31、中间齿轮K32、研磨机齿轮K23以及旋转轴K22等构成。

[0521] 粉原料收集/喷出板K24在粉碎咖啡豆时对送出到后述的粉送出通路K26的咖啡粉进行收集来向前方的粉原料供给部K4侧喷出。该粉原料收集/喷出板K24形成为具有比下侧细碎环K25的外径大一圈的直径的圆盘状，在其外周部设置有相对于中心沿周向每隔相等角度(60°)进行配置的、向上方突出的6个叶片部K24a(可动部)。另外，在粉原料收集/喷出板K24的叶片部K24a的侧方配置有固定于外壳K1内的通路壁环K27(通路壁)，该通路壁环K27与上侧细碎环K13及下侧细碎环K25的外周面之间划分出粉送出通路K26。

[0522] 该通路壁环K27例如由铝或其合金等以铝为主要成分的金属构成，形成为具有比粉原料收集/喷出板K24的外径大少许的内径的圆筒状。如图94所示，在通路壁环K27的前部设置有将通路壁环K27的内外连通的喷出口K27a，在通路壁环K27的后部设置有向后方突出的、用于将电接地用的后述的连接弹簧K29的一端部卡定的弹簧卡定部K27b。这样构成的通路壁环K27以如下方式固定于外壳K1内：通路壁环K27的内周面与上侧细碎环K13及下侧细碎环K25的外周面相向，将该外周面整体包围。由此，在上侧细碎环K13及下侧细碎环K25的外周面与通路壁环K27的内周面之间，划分出在粉碎咖啡豆时从上侧细碎环K13与下侧细碎环K25之间送出咖啡粉的环状的粉送出通路K26。

[0523] 另外，在通路壁环K27的喷出口K27a，连接有将从该喷出口K27a大致水平地喷出的咖啡粉引导到下方的引导构件K28。该引导构件K28由聚缩醛(polyacetal)制的成形品构成，形成为从背面至下表面敞开的规定形状。而且，在引导构件K28的下侧连接有沿上下方向延伸规定长度的筒状的滑槽K36。

[0524] 并且，在通路壁环K27的弹簧卡定部K27b卡定有用于将通路壁环K27与构成电动机K3的外壳的金属制的外壳K3a电连接的连接弹簧K29。该连接弹簧K29由金属制的螺旋弹簧构成，在一端部插入有通路壁环K27的弹簧卡定部K27b，另一端部与电动机K3的外壳K3a抵接。另外，在电动机K3的外壳K3a设置有连接部K3b，在该连接部K3b连接有地线K30的端子K30a。如以上那样，通路壁环K27按顺序与连接弹簧K29、电动机K3的外壳K3a以及地线K30电连接，由此被接地。接地单元由连接弹簧K29、电动机K3的外壳K3a以及地线K30等构成。

[0525] 接着，参照图95来说明如以上那样构成的研磨机K中的咖啡豆的粉碎动作。此外，该研磨机K设置于供给粉碎前的咖啡豆的罐D10的下方，从咖啡豆供给装置向下方延伸的原料滑槽与料斗K11连接。另外，咖啡豆供给装置能够将种类、烘焙度不同的咖啡豆(热咖啡用、冰咖啡用等)供给到研磨机K。

[0526] 首先，从咖啡豆供给装置经由原料滑槽向研磨机K的料斗K11投入规定量的咖啡豆。在其前后，电动机K3工作，借助驱动齿轮K31和中间齿轮K32对研磨机齿轮K23进行旋转驱动。由此，旋转研磨部K7的旋转轴K22沿逆时针方向旋转，随之原料送料器K21、粉原料收集/喷出板K24以及下侧细碎环K25也沿逆时针方向旋转。

[0527] 投入到料斗K11的咖啡豆如图95中上侧的黑箭头所示那样落下来到达原料送料器K21。通过原料送料器K21沿逆时针方向旋转，到达该原料送料器K21的上端部的咖啡豆被送到下方。在该情况下，原料送料器K21的螺旋凸部K21b与粗碎环K12的粉碎凸部K18协作，对咖啡豆进行粗碎。

[0528] 具体地说，由螺旋凸部K21b从上方施加的按压力作用于原料送料器K21的周围的咖啡豆，该咖啡豆从上方被推向粗碎环K12的粉碎凸部K18的前端部，由此被剪断。由此，被粗碎为能够通过原料送料器K21与粉碎凸部K18之间的尺寸的咖啡豆如图95中下侧的黑箭

头所示那样，通过原料送料器K21来穿过该原料送料器K21与上侧细碎环K13之间的空间，被送到上侧细碎环K13与下侧细碎环K25之间。

[0529] 如上述那样被粗碎的咖啡豆通过由旋转的下侧细碎环K25产生的离心力而沿其径向被传送，并被上侧细碎环K13和下侧细碎环K25的粉碎面K13a、K25a弄得更细、即被细碎。通过该细碎而生成的咖啡粉从上侧细碎环K13与下侧细碎环K25之间被送出到粉送出通路K26。另外，在该情况下，伴随粉原料收集/喷出板K24的旋转，多个叶片部K24a在粉送出通路K26内绕圈移动，通过这些叶片部K24a，粉送出通路K26内的咖啡粉一边被收集，一边如图95中上侧的空心箭头所示那样从通路壁环K27的喷出口K27a喷出到前方。然后，所喷出的该咖啡粉撞上引导构件K28的内表面K28a，由此如图95中下侧的空心箭头所示那样转向为下方，经由滑槽K36被供给到未图示的下方的咖啡提取机。

[0530] 如以上那样，根据研磨机K，对咖啡豆在进行细碎之前进行粗碎，因此与直接对咖啡豆进行细碎的情况相比，能够抑制电动机K3的驱动负荷的变动。由此，能够充分且稳定地粉碎咖啡豆，生成粒径大致均匀的咖啡粉，另外，作为电动机K3，能够采用输出转矩小、即尺寸小而廉价的电动机，因此能够制造出作为装置整体而言紧凑且低成本的研磨机K。

[0531] 接着，说明去除在粉碎咖啡豆时在研磨机K的内部产生的静电(除电)的方法。当如上述那样利用研磨机K来粉碎咖啡豆时，在研磨机K的内部，由于与咖啡豆、咖啡粉的摩擦而产生静电。具体地说，原料送料器K21、粗碎环K12、上侧细碎环K13、下侧细碎环K25以及通路壁环K27带有正负电中的一个极性的电，与其相反，所生成的咖啡粉带有正负电中的另一个极性的电。

[0532] 图96示出了带电序列的一例。根据该带电序列可以明确，铁和铝通过与咖啡豆的摩擦而容易带负电，另一方面，咖啡豆容易带正电。因而，在研磨机K中，当粉碎咖啡豆时，由不锈钢或铝等构成的原料送料器K21、粗碎环K12、上侧细碎环K13、下侧细碎环K25以及通路壁环K27带负电，所生成的咖啡粉带正电。特别是，从上侧细碎环K13和下侧细碎环K25送出到粉送出通路K26的咖啡粉是以被在该粉送出通路K26内转圈移动的叶片部K24a推向通路壁环K27的内表面的状态一边滑动一边被收集的，因此产生比较大的摩擦力，其结果，咖啡粉和通路壁环K27的带电量比较大。

[0533] 如前所述，在研磨机K中，通路壁环K27被接地，因此如图97的虚线箭头所示那样，在带负电的通路壁环K27中，其负电荷的大部分经由连接弹簧K29、电动机K3的外壳K3a以及地线K30而被去除。另外，在该情况下，从上侧和下侧细碎环K13、K25送出到粉送出通路K26的咖啡粉作为将两个细碎环K13、K25与通路壁环K27连接的导体发挥功能，由此原料送料器K21、粗碎环K12、上侧细碎环K13以及下侧细碎环K25的负电荷的大部分也经由通路壁环K27、连接弹簧K29、电动机K3的外壳K3a以及地线K30而被去除。

[0534] 另一方面，带正电的咖啡粉如前述那样经由通路壁环K27的喷出口K27a向前方喷出，撞上引导构件K28的内表面K28a后转向为下方。如前所述，引导构件K28由聚缩醛构成，在图96所示的带电序列上，与咖啡豆相比，聚缩醛带正电的倾向大。因此，带正电的咖啡粉通过因与引导构件K28的内表面K28a接触所产生的摩擦而相对地带负电。也就是说，原本带正电的咖啡粉的带电量(电位)下降。另外，在该情况下，引导构件K28带上与咖啡粉的带电量的下降量相应的正电。

[0535] 根据以上，成为咖啡粉和引导构件K28均带相同极性的电、即正电的状态，因此两

者之间有斥力作用，由此咖啡粉难以附着于引导构件K28的内表面K28a，而被顺畅地引导到后续的滑槽K36，进一步被引导到其下方的咖啡提取机。另外，该咖啡粉变为接近电中性的状态，因此在之后的咖啡提取时，容易与水(包括热水)混合，其结果，咖啡的提取效率提高。

[0536] 如以上所详细叙述的那样，根据研磨机K，通过除电，能够降低其内部的带电量，并且能够抑制通过沿通路壁环K27滑动而带电的咖啡粉的带电量的上升。由此，能够大幅减少咖啡粉附着/残留于研磨机K的内部的情况，能够从研磨机K高精度地喷出该咖啡粉。

[0537] <冲泡机构L>

[0538] 下面，参照附图来详细说明冲泡机构L的优选实施方式。图98是示意性地表示具备滤纸式的冲泡机构的杯式自动售货机的内部构造的图，图99是示意性地表示具备永久过滤器式的冲泡机构的杯式自动售货机的内部构造的图。这些杯式自动售货机1LA、1LB利用冲泡机构L(饮料提取装置)，使用咖啡豆和热水(冷水)来提取咖啡，向使用者提供杯装的普通咖啡。

[0539] 滤纸式的冲泡机构L是利用后述的滤纸LP和滤网L72对所提取的咖啡进行过滤的类型，另一方面，永久过滤器式的冲泡机构L是仅利用滤网L72对所提取的咖啡进行过滤的类型。

[0540] 此外，在本项目<冲泡机构L>的说明中，在对滤纸式和永久过滤器式的冲泡机构L进行区分的情况下，分别适当地称呼为“纸冲泡机LA”和“网冲泡机LB”。另外，将具备纸冲泡机LA的杯式自动售货机设为杯式自动售货机1LA，将具备网冲泡机LB的杯式自动售货机设为杯式自动售货机1LB，代表地说时设为杯式自动售货机1。

[0541] 如图98和图99所示，杯式自动售货机1具备：冲泡机构L；分别向该冲泡机构L供给规定量的咖啡粉(以下称为“原料”)和热水的罐D10和温水箱F；将由冲泡机构L提取出的咖啡与奶油、砂糖一起混合的搅拌碗M；以及向该搅拌碗M供给奶油、砂糖的粉末原料供给机构D-1。另外，如图100所示，它们由具有微型计算机的控制部来控制。此外，在能够在配置杯W的烹调位置适当地对热水、粉末原料等进行搅拌的情况下，能够省略搅拌碗M。对于罐D10、温水箱F、搅拌碗M、粉末原料供给机构D-1另行说明。

[0542] 接着，详细叙述冲泡机构L。图100示出了纸冲泡机LA，图101示出了网冲泡机LB。如两图所示，关于纸冲泡机LA和网冲泡机LB，实质进行咖啡的提取的冲泡机主体L20大致共同，纸冲泡机LA在冲泡机主体L20安装有后述的滤纸送出装置L201，另一方面，网冲泡机LB仅由冲泡机主体L20构成。

[0543] 图102和图103按后述的单元将纸冲泡机LA进行分解来表示。此外，在下面的说明中，首先，说明两个冲泡机LA和LB共同的冲泡机主体L20，说明中包括两个冲泡机LA和LB的不同点，之后，说明纸冲泡机LA中的滤纸送出装置L201。

[0544] 冲泡机主体L20由用于提取咖啡的滴漏单元L21以及驱动该滴漏单元L21的主体驱动单元L22构成。主体驱动单元L22通过螺纹固定等来固定于杯式自动售货机1内，在该主体驱动单元L22装卸自如地安装有滴漏单元L21。

[0545] 滴漏单元L21由缸L23(提取容器)和缸架L24构成，该缸L23被供给原料和热水，用于在内部进行咖啡的提取，该缸架L24用于将该缸L23装卸自如地收容。

[0546] 图104示出了从缸架L24拆下了缸L23的状态。该缸L23由塑料构成，如该图和图105所示，形成为沿上下方向延伸并且上表面和下表面敞开的、具有规定的尺寸(例如，高度：

102mm、容积:328ml)的圆筒状。另外,在缸L23的外周面设置有在将缸L23安装到缸架L24或从缸架L24卸下时利用的把手L25和引导部L26。引导部L26由在上下方向上彼此相隔规定间隔地设置的、形成为上下对称的上下2个引导部L26、L26构成。

[0547] 另外,在缸L23的内表面设置有热水引导壁L27,该热水引导壁L27用于沿着内表面的周向引导被供给到缸L23的热水。如图105所示,热水引导壁L27是在缸L23的上端附近与上下方向的中央部之间沿着缸L23的内表面设置的,并且向内侧突出少许,俯视形状形成为向把手L25的相反侧敞开的U字状。并且,在缸L23的内表面设置有热水扩散凸部L28,该热水扩散凸部L28用于使沿着缸L23的内表面向下方流动的热水在缸L23的下半部沿周向扩散。该热水扩散凸部L28在缸L23的上下方向的中央部朝向内侧呈锥状地突出规定长度,在缸L23的整个周向上延伸。

[0548] 如图106所示,缸架L24形成为在内侧具有缸收容部L24a的盒状,具备以下部件等:过滤块L32,其升降自如地设置于缸架L24的内侧的下部,用于将缸L23内的咖啡一边过滤一边输送到外部;接缸器L34,其以从左右将收容于缸收容部L24a的缸L23夹持的状态保持该缸L23;以及前表面罩L35,其在上端部被旋转自如地支承,用于开闭缸架L24的前表面。

[0549] 另外,缸架L24的外廓包括彼此相隔规定间隔地相向的左右的侧壁L41、L41、设置成跨两侧壁L41、L41的后端部之间且覆盖其上半部的背壁L42、以及设置成跨两侧壁L41、L41的下端部之间的底壁L43等,缸架L24的前表面、上表面以及背面下半部敞开。此外,虽未进行图示,但是底壁L43利用多个棒状构件形成为格子状。另外,在左右的侧壁L41、L41的上部,在靠前端的位置设置有将两侧壁L41、L41之间连结的前上罩L36,在该前上罩L36的后方装卸自如地安装有覆盖缸架L24的上表面的架罩L37。

[0550] 并且,在左右的侧壁L41、L41的前端部和后端部,分别在下部的规定位置装卸自如地安装有用于引导滤纸LP的引导辊L38和L39。这些引导辊L38、L39跨左右的侧壁L41、L41之间沿左右方向延伸,旋转自如地被支承于两侧壁L41、L41。另外,两个引导辊L38、L39安装于纸冲泡机LA的缸架L24(参照图102),另一方面,在网冲泡机LB中被拆下。

[0551] 缸架L24的左右的侧壁L41、L41分别具备:箱状的侧壁主体L44,其侧面形状形成为大致矩形,并且外侧的侧面敞开;以及外罩L45,其以覆盖侧壁主体L44的敞开的侧面的方式螺纹固定于侧壁主体L44。而且,如图107所示,在各侧壁L41内设置有缸开闭机构L51,该缸开闭机构L51通过驱动过滤块L32和后述的缸盖L101来分别开闭缸L23的下表面和上表面。此外,左右的缸开闭机构L51、L51在左右的侧壁L41、L41内构成为大致左右对称,因此在下面的说明中,以内置于右侧的侧壁L41的缸开闭机构L51为中心来进行说明。

[0552] 如图107及图108、图109所示,缸开闭机构L51具备:凸轮圆板L55,其旋转自如地支承于在侧壁主体L44内的上半部的中央附近突出设置的支轴L44a,具有第一凸轮槽L53和第二凸轮槽L54;滑动件L56,其沿上下方向滑动自如地设置于侧壁主体L44内的下半部,与凸轮圆板L55的第一凸轮槽L53卡合,并且与过滤块L32连结;以及缸盖锁定构件L57,其旋转自如地支承于在侧壁主体L44内的上部的规定位置突出设置的支轴L44b,与凸轮圆板L55的第二凸轮槽L54卡合,并且用于将后述的缸盖L101锁定为按压到缸L23的上表面的状态。

[0553] 凸轮圆板L55形成为具有规定的直径和厚度的圆板状,在整个周面形成有齿轮部L55a。另外,在凸轮圆板L55的外罩L45侧的周缘部的大致1/2圆弧的部分设置有沿径向突出少许的凸部L55b。并且,在凸轮圆板L55的侧壁主体L44侧的侧面设置有第一凸轮槽L53和第

二凸轮槽L54。

[0554] 如图110所示，第一凸轮槽L53包括：外侧凸轮部L61，其设置于凸轮圆板L55的侧面的周缘部，呈以凸轮圆板L55的支轴L44a为中心的圆弧状地延伸，且沿逆时针方向延伸大致一周；驱动凸轮部L62，其与该外侧凸轮部L61相连，朝向支轴L44a呈圆弧状地延伸；以及内侧凸轮部L63，其与该驱动凸轮部L62相连，呈以支轴L44a为中心的圆弧状地延伸，且在支轴L44a的附近延伸大致一周。另外，外侧凸轮部L61中的驱动凸轮部L62附近的规定角度部分(以下称为“接近部L61a”)形成为与除其以外的外侧凸轮部L61相比更靠支轴L44a。

[0555] 另一方面，第二凸轮槽L54包括：外侧凸轮部L64，其设置于比第一凸轮槽L53的外侧凸轮部L61靠内侧的位置，呈以支轴L44a为中心的圆弧状地延伸，且从外侧凸轮部L61的顶端部附近起沿逆时针方向延伸为大致3/4个圆弧状；驱动凸轮部L65，其与该外侧凸轮部L64相连，朝向支轴L44a延伸；以及内侧凸轮部L66，其与该驱动凸轮部L65相连，呈以支轴L44a为中心的圆弧状地延伸。

[0556] 如图109所示，滑动件L56沿上下方向延伸，并且下部朝向下方扩宽，形成为大致凸字状。在该滑动件L56的上端部设置有向凸轮圆板L55侧突出的卡合凸部L56a，该卡合凸部L56a滑动自如地与凸轮圆板L55的第一凸轮槽L53卡合。另外，在滑动件L56的下端部固定有将滑动件L56与过滤块L32连结的2根连结轴L71、L71。两个连结轴L71、L71以在前后方向(在图108、图109中为左右方向)上彼此隔开间隔且在左右方向(在图108、图109中为图的表里方向)上平行的方式延伸。各连结轴L71贯通侧壁主体L44的沿上下方向延伸的长孔L44c，一端部固定于上述滑动件L56，另一方面，另一端部固定于左侧的缸开闭机构L51的滑动件L56。因而，过滤块L32借助两个连结轴L71、L71而支承于左右的滑动件L56、L56。另外，在滑动件L56的中央部形成有沿上下方向延伸的长孔L56b，在该长孔L56b中滑动自如地贯通有在侧壁主体L44内的下部的规定位置突出设置的支轴L44d。

[0557] 如以上那样构成的滑动件L56随着凸轮圆板L55的旋转，在侧壁主体L44内的沿上下方向延伸的一对导轨L44e、L44e之间被引导的同时沿上下方向滑动。随之，过滤块L32进行升降，来开闭缸L23的下表面。具体地说，图107的(a)及图108、图109所示的凸轮圆板L55沿两图的顺时针方向旋转，滑动件L56的卡合凸部L56a从第一凸轮槽L53的外侧凸轮部L61朝向内侧凸轮部L63地在驱动凸轮部L62上滑动，由此滑动件L56上升。

[0558] 然后，滑动件L56的卡合凸部L56a到达内侧凸轮部L63，由此在纸冲泡机LA的滴漏单元L21中，过滤块L32以隔着滤纸LP来与缸L23的下表面紧贴的状态将其密封(参照图135)。另一方面，在网冲泡机LB的滴漏单元L21中，过滤块L32以直接与缸L23的下表面紧贴的状态将其密封(参照图146、图158)。然后，从这些状态起凸轮圆板L55沿逆时针方向旋转，滑动件L56下降，由此过滤块L32也下降，由此，缸L23的下表面被开放(参照图141、图152、图163)。

[0559] 如图106、图107和图111所示，过滤块L32包括以下部件等：圆形的滤网L72，其用于过滤咖啡；宽环状的密封件L73，其设置成包围该滤网L72的周围；以及块状的支承构件L74，其在上表面支承该滤网L72和该密封件L73，并且具有上下连通的通路。滤网L72由比缸L23的内径小一圈的薄板状的金属板(例如不锈钢板)构成，形成有大量的具有规定的直径(例如30μm)的细孔。这样构成的过滤块L32如前述那样随着滑动件L56的上下方向的滑动而升降，在封闭缸L23的下表面时，密封件L73的上表面以与缸L23的下表面周缘部抵接的状态将

其密封。在该情况下，在纸冲泡机LA中，过滤块L32与缸L23之间夹持滤纸LP，另一方面，在网冲泡机LB中，过滤块L32直接与缸L23抵接。

[0560] 另外，在过滤块L32的支承构件L74与设置于右侧的侧壁L41的背面下端部的接合软管L40(参照图107)之间连接有过滤块管L32a。此外，在滴漏单元L21安装于主体驱动单元L22的状态下，接合软管L40与主体驱动单元L22侧的后述的接合软管L140连接。

[0561] 另外，如图107的(a)及图108、图109所示，在右侧的侧壁L41的下端部设置有与上述接合软管L40连接的废液管L50，并且设置有对该废液管L50进行开闭的废液管夹紧构件L58。废液管L50由橡胶等弹性材料构成，具有从接合软管L40向前方水平地延伸的水平部L50a，从该水平部L50a向下方延伸。另外，废液管夹紧构件L58形成为沿上下方向延伸的板状，在上端部设置有与滑动件L56的长孔L56b滑动自如地卡合的卡合凸部L58a，另一方面，在下端部，在废液管L50的水平部L50a的下侧设置有以横贯该水平部L50a的方式突出且具有梯形的截面的按压部L58b。并且，在废液管L50的水平部L50a的上侧，设置有用于与废液管夹紧构件L58协作来夹紧废液管L50以将其封闭的压紧弹簧L59。该压紧弹簧L59由细长的片簧构成，沿着废液管L50的水平部L50a延伸，配置成与该水平部L50a相接。另外，压紧弹簧L59的两端部向上方弯折，被侧壁主体L44内的设置于废液管夹紧构件L58的前后(在图108、图109中为左右)的2个支承部L44f、L44f所支承。

[0562] 如上述那样构成的废液管夹紧构件L58与伴随凸轮圆板L55的旋转的滑动件L56的升降连动地进行升降。具体地说，当从图108、图109所示的状态起滑动件L56上升时，其长孔L56b的下端部与废液管夹紧构件L58的卡合凸部L58a抵接。然后，当滑动件L56进一步上升时，废液管夹紧构件L58借助卡合凸部L58a被举起，由此上升。由此，废液管夹紧构件L58的按压部L58b从下方挤压废液管L50的水平部L50a，由此，废液管L50被封闭(参照图135等)。此外，从该状态起，通过滑动件L56的下降，废液管夹紧构件L58也下降来返回到原来的位置。

[0563] 另外，如图109所示，缸盖锁定构件L57形成为沿上下方向延伸的规定形状，其中心部旋转自如地支承于侧壁主体L44内的支轴L44b。在缸盖锁定构件L57的下端部设置有向凸轮圆板L55侧突出的卡合凸部L57a，该卡合凸部L57a与凸轮圆板L55的第二凸轮槽L54滑动自如地卡合。另外，在缸盖锁定构件L57的上端部设置有以向后方突出的方式延伸的钩状的锁定部L57b。

[0564] 这样构成的缸盖锁定构件L57伴随凸轮圆板L55的旋转而旋转，通过上端部的锁定部L57b将后述的缸盖L101按压且锁定到缸L23的上表面，由此将缸L23的上表面密封。具体地说，图109和图110所示的凸轮圆板L55沿两图的顺时针方向旋转，缸盖锁定构件L57的卡合凸部L57a从第二凸轮槽L54的外侧凸轮部L64朝向内侧凸轮部L66地在驱动凸轮部L65上滑动，由此缸盖锁定构件L57以支轴L44b为中心沿图109的顺时针方向旋转。然后，缸盖锁定构件L57的锁定部L57b以与后述的缸盖L101的上部的盖引导棒L113卡合并且将其向下方压下的方式进行锁定。由此，缸盖L101以紧贴缸L23的上表面的状态将其密封(参照图138等)。

[0565] 如以上那样构成的缸开闭机构L51如前述那样分别内置于左右的侧壁L41、L41，两个缸开闭机构L51、L51的凸轮圆板L55的齿轮部L55a、L55a与旋转自如地设置于对应的侧壁主体L44内的规定位置的齿轮L76、L76啮合。如图107所示，两个齿轮L76、L76固定于沿左右方向水平延伸的动力传递轴L75的两端部，各齿轮L76配置于对应的侧壁主体L44内的后端

部的上下方向的中央部。如图107的(b)所示，设置于左侧的侧壁主体L44的齿轮L76(以下称为“从动接合齿轮L76a”)向后方露出少许，在滴漏单元L21安装于主体驱动单元L22的状态下与主体驱动单元L22侧的后述的驱动接合齿轮L124啮合。因而，当从动接合齿轮L76a旋转时，与其啮合的左侧的凸轮圆板L55旋转，借助动力传递轴L75和右侧的齿轮L76，右侧的凸轮圆板L55与左侧的凸轮圆板同步地旋转。

[0566] 另外，在左右的侧壁L41、L41分别设置有在将滴漏单元L21从主体驱动单元L22拆下时操作的拆卸杆L84、L84。如图108、图109所示，拆卸杆L84沿前后方向延伸，在其长度方向的大致中央处旋转自如地支承于支轴L44d。拆卸杆L84的前端部(图108、图109的左端部)的操作部L84a面对侧壁L41的外部，并且位于设置于侧壁L41的前部且向前方敞开的凹部L41a的内侧。另外，拆卸杆L84的后端部向下方延伸规定长度，在其下端部设置有向侧方突出的拆卸凸部L84b。如图102等所示，该拆卸凸部L84b经由形成于侧壁L41的外罩L45的规定位置的长孔L45a突出到外部。

[0567] 在此，参照图102、图112、图113、图114、图115来说明滴漏单元L21相对于主体驱动单元L22的装卸构造。如图102及图112、图113所示，在滴漏单元L21的左右的侧面(外罩L45)，在后端部的规定位置设置有上下2个卡合凸部L45b、L45b。各卡合凸部L45b向外侧突出少许，侧面形状形成为向下方开口的コ字状。另外，在滴漏单元L21的左右的侧壁L41、L41，在背面的上端部和下端部形成有共4个向后方敞开的支承孔L41b(参照图107的(b))。

[0568] 另一方面，在主体驱动单元L22的前部的左右端部分别以与滴漏单元L21的上下的卡合凸部L45b、L45b对应的方式设置有向前方突出的上下2个钩状的锁定部L85、L85。如图113所示，这些锁定部L85、L85分别安装于沿上下方向延伸且侧面形状为向前方开口的コ字状的连结构件L86的上下的前端部。另外，左右的连结构件L86、L86在上端部利用片簧L87被连结，并且向下方被施力。并且，在主体驱动单元L22的左右两端部，在与滴漏单元L21的4个支承孔L41b分别对应的位置处设置有共4个向前方突出的支承突起L88(参照图102)。

[0569] 通过如以上那样构成的滴漏单元L21侧和主体驱动单元L22侧的装卸构造，如图113所示，在将滴漏单元L21安装于主体驱动单元L22的前侧的状态下，主体驱动单元L22的各支承突起L88插入于滴漏单元L21的各支承孔L41b，并且主体驱动单元L22的各锁定部L85与滴漏单元L21的各卡合凸部L45b卡合。由此，滴漏单元L21牢固地安装于主体驱动单元L22的前侧。另一方面，在将滴漏单元L21从主体驱动单元L22拆下的情况下，如图115所示，将滴漏单元L21的前表面罩L35开放少许，并将左右的拆卸杆L84的操作部L84a同时压下。由此，各拆卸杆L84的拆卸凸部L84b抵抗片簧L87的施力来将主体驱动单元L22侧的下侧的锁定部L85顶起，其结果，上下的锁定部L85、L85从滴漏单元L21的上下的卡合凸部L45b、L45b脱离。然后，保持该状态地将滴漏单元L21向前方拉出，由此滴漏单元L21从主体驱动单元L22拆下。

[0570] 另外，如图107的(b)所示，在滴漏单元L21的左侧的侧壁L41内，设置有用于在将滴漏单元L21从主体驱动单元L22拆下时使凸轮圆板L55无法旋转的凸轮锁定机构L89。该凸轮锁定机构L89形成为规定形状，包括在从动接合齿轮L76a的下方沿上下方向滑动自如的锁定构件L89a以及对该锁定构件L89a向上方施力的弹簧L89b。在滴漏单元L21从主体驱动单元L22被拆下时，锁定构件L89a从下方与从动接合齿轮L76a卡合，由此使该从动接合齿轮L76a无法旋转。由此，与从动接合齿轮L76a啮合的凸轮圆板L55也变得无法旋转。另一方面，

在滴漏单元L21安装于主体驱动单元L22时，在主体驱动单元L22的前侧突出设置的锁定解除凸部L90(参照图102)与上述锁定构件L89a卡合，将其向下方压下，由此解除锁定构件L89a对从动接合齿轮L76a的锁定。由此，从动接合齿轮L76a变得能够旋转，由此凸轮圆板L55也变得能够旋转。

[0571] 如上述那样在滴漏单元L21从主体驱动单元L22被拆下的状态下将凸轮圆板L55锁定为无法旋转是基于下面的理由。即，如后所述，利用设置于主体驱动单元L22的、具有与凸轮圆板L55同步地旋转的开关齿轮L125a的模式开关L125来进行凸轮圆板L55的旋转角度的控制。因此，需要保持开关齿轮L125a与凸轮圆板L55的旋转角度的一致性。

[0572] 接着，说明对收容于缸架L24内的缸L23进行把持的接缸器L34。如图106所示，接缸器L34包括俯视形状为向前方开口的コ字状的支承构件L91以及分别固定于该支承构件L91的左右的前端部的左右的把持构件L92、L92。支承构件L91由片簧构成，包括沿左右方向延伸规定长度的基部L91a以及在该基部L91a的左右端部分别弯折为直角且向前方延伸规定长度的左右2个臂部L91b、L91b。基部L91a螺纹固定于背壁L42的内侧面。而且，在两个臂部L91b、L91b的前端部固定有把持构件L92、L92。两个把持构件L92、L92彼此相向，它们的相向面形成为凸状。

[0573] 通过这样构成的接缸器L34，利用支承构件L91的弹簧力，由左右的把持构件L92、L92从左右牢固地夹持收容于缸架L24的缸收容部L24a的缸L23。

[0574] 如图100～图103所示，覆盖缸架L24的上表面的架罩L37形成为俯视形状为大致矩形，设置有用于将原料投入到缸L23的原料投入口L37a、用于向缸L23供给热水的热水供给口L37b以及用于排出在烹调咖啡时产生的蒸气的热气排出口L37c。在原料投入口L37a连接有研磨机K的滑槽，在热水供给口L37b连接有热水供给管，而且，在热气排出口L37c连接有排热气用的软管(未图示)。

[0575] 接着，参照图116～图120来说明主体驱动单元L22。主体驱动单元L22对上述的滴漏单元L21的凸轮圆板L55以及对缸L23的上表面进行开闭的缸盖L101进行驱动，并且向缸L23供给空气，并且，在网冲泡机LB中，对用于排出提取渣的刮刀L102进行驱动。

[0576] 图116和图117分别示出了纸冲泡机LA和网冲泡机LB的主体驱动单元L22。如两图所示，主体驱动单元L22具备以下部件等：构成主体驱动单元L22的前壁的塑料制的框架L103(外壳、壁部)；从该框架L103的上部向前方突出且设置成沿前后方向移动自如的缸盖L101；对凸轮圆板L55进行驱动的凸轮驱动机构L104；对缸盖L101和刮刀L102进行驱动的缸盖/刮刀驱动机构L105；对后述的多个夹紧件L8进行驱动的夹紧件驱动机构L106；以及向缸L23供给空气的空气泵L107。上述的凸轮驱动机构L104、缸盖/刮刀驱动机构L105、夹紧件驱动机构L106以及空气泵L107安装于框架L103的背面侧，被前表面和底面敞开的盒状的单元罩L108(外壳)所覆盖。

[0577] 图166示出了从背面侧观察框架L103时的空气泵L107及其周围。该空气泵L107是隔膜式的空气泵，即，通过电动机的旋转使隔膜往复移动，由此吸引空气并喷出该空气。如该图所示，空气泵L107具有在前后方向(该图的表里方向)上彼此隔开间隔且形成为相互平行地突出的空气吸引口L107a和空气喷出口(未图示)。空气吸引口L107a经由空气吸引管L302(空气吸引通路)来与吸气空间划分部L301连接，该吸气空间划分部L301在框架L103的背面侧构成为大致密闭的状态。另一方面，空气喷出口经由空气喷出管及分支管(均未图

示)来与后述的第一空气输送管L9A及第二空气输送管L9B连接。

[0578] 如图167所示,吸气空间划分部L301具有与框架L103成一体且向主体驱动单元L22的内侧突出规定长度的肋L303。该肋L303包括彼此相连的上下左右4个肋L303,通过这些肋L303,在其内侧划分出吸气空间L304,并且形成向主体驱动单元L22的内侧敞开且正面形状为矩形的开口部L305。另外,在上侧的肋L303的右端部设置有更加突出的凸部L303a(抵接部),在下侧的肋L303上设置有螺纹孔L303b。而且,在上述肋L303的前端部安装有将开口部L305封闭的封闭板L311。

[0579] 封闭板L311是通过对金属板进行冲压加工等而形成的,正面形状形成为比上述开口部L305大与各肋L303的厚度相当的一圈的大致矩形。另外,封闭板L311的左缘部和上缘部的左半部被弯折为直角。并且,在封闭板L311中,在左下角部形成有管安装孔L312(通路连接口),该管安装孔L312用于将空气吸引管L302的与空气吸引口L107a相反的一侧的端部以插入的状态进行安装,在下缘部形成有螺纹插入孔L314,该螺纹插入孔L314插入用于将封闭板L311本身螺纹固定于肋L303的螺丝L313。另外,在封闭板L311中,在上缘部的右端部设置有微小的缺口L315。该缺口L315向上方敞开,正面形状形成为V字状。

[0580] 这样构成的封闭板L311与上述肋L303的前端部抵接,螺丝L313以插入到螺纹插入孔L314的状态拧入肋L303的螺纹孔L303b,由此封闭板L311被安装为将开口部L305封闭的状态。在该情况下,封闭板L311的弯折的左缘部和上缘部分别位于左侧和上侧的肋L303的外侧,另外,缺口L315的上缘部从下方与上侧的肋L303的凸部L303a抵接。

[0581] 如以上那样,封闭板L311安装于肋L303,由此构成了划分出内部的吸气空间L304的吸气空间划分部L301。因而,当空气泵L107工作时,吸气空间L304的空气经由空气吸引管L302被吸引到空气吸引口L107a。然后,所吸引的该空气从空气喷出口被加压输送到第一空气输送管L9A和第二空气输送管L9B侧,经由这些空气输送管被供给到缸L23。

[0582] 缸盖L101具有:圆形的盖主体L111,其俯视形状比缸L23的上表面大;以及滑动件L112,其设置成以贯通设置于框架L103的上部的上部开口L103a的状态沿前后方向移动自如,在前端部将盖主体L111以上下自如地摇动少许的方式进行支承。盖主体L111与后述的第一空气输送管L9A连接,在盖主体L111的底面的规定位置设置有用于将经由第一空气输送管L9A输送的空气送出到下方的空气供给口(未图示)。另外,在盖主体L111的上端部设置有比盖主体L111的外形长、且沿左右方向延伸的盖引导棒L113。该盖引导棒L113在滴漏单元L21安装于主体驱动单元L22的状态下,沿前后方向滑动自如地与缸架L24的左右的侧壁L41、L41的上端部卡合。

[0583] 并且,在盖主体L111的前半上部安装有将来自架罩L37的原料投入口L37a的原料以及来自热水供给口L37b的热水引导到缸L23的原料/热水引导构件L114。该原料/热水引导构件L114由设置于盖主体L111的前方的辅助原料滑槽L115以及设置于该辅助原料滑槽L115的左方的热水引导接受部L116来一体地构成。辅助原料滑槽L115形成为沿上下方向延伸的筒状,在缸盖L101位于待机位置时,辅助原料滑槽L115位于架罩L37的原料投入口L37a与缸L23之间,将从原料投入口L37a投入的原料进一步引导到缸L23。

[0584] 另一方面,热水引导接受部L116形成为上表面敞开的箱状,在缸盖L101位于待机位置时,热水引导接受部L116将从架罩L37的热水供给口L37b供给的热水进一步引导到缸L23,并且从热水供给口L37b接受滴漏的热水,由此防止缸盖L101被该热水淋湿。另外,在热

水引导接受部L116的底壁的前端部设置有沿上下方向贯通的、向下方突出少许的辅助热水供给喷嘴L116a。在缸盖L101位于待机位置时，该辅助热水供给喷嘴L116a配置于从正上方面对缸L23内的热水引导壁L27的位置。因而，从热水供给口L37b流入到热水引导接受部L116、并从辅助热水供给喷嘴L116a喷出的热水从上方撞上缸L23内的热水引导壁L27，一边由该热水引导壁L27沿缸L23的内表面的周向引导，一边往下流到缸L23内。另外，沿着缸L23的内表面往下流的热水暂时被缸L23内的热水扩散凸部L28接收，再一边沿缸L23的内表面的周向扩散一边向下方流动。如以上那样，热水被供给到缸L23。

[0585] 如图116的(a)所示，在纸冲泡机LA的主体驱动单元L22中，安装有以从前方覆盖设置于框架L103的中央部的中央部开口L103b的状态沿上下方向延伸的导纸板L109。该导纸板L109具有覆盖框架L103的下半部并且侧面形状为向后方凸弯曲的弯曲部L109b以及从该弯曲部L109b向斜下后方延伸规定长度的倾斜部L109a。

[0586] 在要将滤纸LP放置在滴漏单元L21的缸L23与过滤块L32之间时，手动地将滤纸LP从纸冲泡机LA的下方插入来给送，由此滤纸LP的前端部沿着导纸板L109的倾斜部L109a被引导到上方，再沿着弯曲部L109b被引导到前方。由此，滤纸LP从滴漏单元L21的后侧经过缸L23与过滤块L32之间，到达滴漏单元L21的前方。这样，能够利用导纸板L109来简单地进行滤纸LP的放置。

[0587] 另外，如图117的(a)所示，在网冲泡机LB的主体驱动单元L22中，在框架L103的中央部开口L103b处放置刮刀L102。如图117的(b)所示，刮刀L102包括：支撑件L102a，其俯视形状形成为比过滤块L32的俯视形状大一圈的矩形框状；以及橡胶制的刮刀主体L102b，其以从支撑件L102a的前端部垂下的方式安装于支撑件L102a，正面形状为横长矩形。在支撑件L102a的后端部设置有沿左右方向延伸并且向上方开口的卡合槽L102c，在该卡合槽L102c的规定位置形成有向后方开口的缺口L102d。

[0588] 这样构成的刮刀L102能够在被框架L103的中央部开口L103b的左右的缘部所引导的同时沿前后方向滑动。而且，该刮刀L102被缸盖/刮刀驱动机构L105所驱动，由此前端部的刮刀主体L102b在过滤块L32上沿前后方向移动。由此，作为在提取咖啡后残留在滤网L72上的原料的提取渣被刮刀主体L102b刮下，并被排出到滴漏单元L21的前方或后方。

[0589] 如图118所示，凸轮驱动机构L104具有：第一电动机L121，其由DC电动机构成；输出齿轮L123，其经由齿轮箱L122(参照图120)来与该第一电动机L121连接；以及驱动接合齿轮L124，其与该输出齿轮L123啮合，并且在滴漏单元L21安装于主体驱动单元L22的状态下，与滴漏单元L21侧的从动接合齿轮L76a啮合。

[0590] 在输出齿轮L123的附近设置有用于控制凸轮圆板L55的旋转角度的模式开关L125。该模式开关L125具有开关齿轮L125a，该开关齿轮L125a借助中间齿轮L126来与输出齿轮L123啮合，与凸轮圆板L55同步地以相等角度进行旋转。模式开关L125具有在开关齿轮L125a旋转为多个规定的旋转角度时变为接通状态的多个模式，控制部根据这些模式来识别凸轮圆板L55的旋转角度。

[0591] 缸盖/刮刀驱动机构L105包括以下部件等：第二电动机L131，其由DC电动机构成；齿轮箱L132，其与该第二电动机L131连接，具有沿上下方向延伸且两端部向外部突出的输出轴(未图示)；缸盖驱动部(未图示)和刮刀驱动部L133，它们分别设置于上述输出轴的上下端部。缸盖驱动部与缸盖L101的滑动件L112的后端部卡合，伴随上述输出轴的旋转而旋

转，由此将缸盖L101在待机位置(图118的实线所示的位置)与将缸L23封闭的封闭位置(图118的双点划线所示的位置)之间沿前后方向进行驱动。

[0592] 另一方面，刮刀驱动部L133具有水平地延伸规定长度的臂L133a以及从其前端部向下方突出的卡合凸部L133b。在网冲泡机LB的主体驱动单元L22中，在刮刀L102从框架L103的前方被放置到中央部开口L103b时，刮刀驱动部L133的卡合凸部L133b经由刮刀L102的后端部的缺口L102d来与卡合槽L102c卡合。伴随缸盖/刮刀驱动机构L105的上述输出轴的旋转，刮刀驱动部L133进行旋转，由此卡合凸部L133b在刮刀L102的卡合槽L102c内滑动。由此，刮刀L102在待机位置(图119的实线所示的位置)与刮刀主体L102b比过滤块L32的前端靠前方的位置(图119的双点划线所示的位置)之间沿前后方向移动。

[0593] 此外，上述的缸盖驱动部和刮刀驱动部L133均经由单向离合器来与输出轴连结，在输出轴沿规定方向旋转时，仅缸盖驱动部进行旋转，在输出轴沿与上述方向相反的方向旋转时，仅刮刀驱动部L133进行旋转。

[0594] 夹紧件驱动机构L106在提取咖啡时对用于对输送管L9的多个规定位置进行开闭的夹紧件L8进行驱动，该输送管L9用于输送咖啡、空气。在此，参照图98、图99来简单说明输送管L9与夹紧件L8的配置关系。如两图所示，输送管L9包括连接于空气泵L107与缸盖L101之间的第一空气输送管L9A、连接于空气泵L107与主体驱动单元L22侧的接合软管L140之间的第二空气输送管L9B以及与接合软管L140连接的饮料输送管L9C。这些输送管L9A～L9C均由橡胶等弹性材料构成。上述接合软管L140设置于主体驱动单元L22的前侧的右下端部，在滴漏单元L21安装于主体驱动单元L22的状态下，与滴漏单元L21侧的接合软管L40连接。

[0595] 另外，夹紧件L8包括分别安装于上述输送管L9A～L9C的中途的3个夹紧件、具体地说是第一空气夹紧件L8A、第二空气夹紧件L8B以及饮料夹紧件L8C。这些夹紧件L8A～L8C是相同的。如图120所示，各夹紧件L8包括：管保持件L141，其对自身被安装的输送管L9的部分进行保持；夹紧件主体L142，其旋转自如地安装于管保持件L141，用于与其协作来对输送管L9进行挤压、封闭；以及凸轮L143，其旋转自如地设置于该夹紧件主体L142的与输送管L9相反的一侧，用于将夹紧件主体L142按压到输送管L9侧。

[0596] 在这样构成的夹紧件L8A～L8C中，第一空气夹紧件L8A与第二空气夹紧件L8B左右相邻地配置，饮料夹紧件L8C配置成在第一空气夹紧件L8A的前方与该第一空气夹紧件L8A相向。此外，在这些夹紧件L8A～L8C中，凸轮L143被共用化。

[0597] 夹紧件驱动机构L106具备与前述的凸轮驱动机构L104共用的第一电动机L121和齿轮箱L122、固定于其输出轴的右端部的输出齿轮L144、以及与该输出齿轮L144啮合并且固定于夹紧件L8的凸轮L143的旋转轴L145的驱动齿轮L146等。

[0598] 如上所述，凸轮驱动机构L104和夹紧件驱动机构L106以第一电动机L121为共同的驱动源，将以下部件驱动成相互协同动作：由凸轮驱动机构L104驱动的凸轮圆板L55、过滤块L32、缸盖锁定构件L57及废液管夹紧构件L58；以及由夹紧件驱动机构L106驱动的3个夹紧件L8A～L8C。由此，在提取咖啡时，能够高效且适当地进行缸L23的上表面和下表面的开闭、废液管夹紧构件L58对废液管L50的开闭以及夹紧件L8A～L8C对输送管L9A～L9C的开闭。

[0599] 接着，参照图121～图128来说明纸冲泡机LA的滤纸送出装置L201。该滤纸送出装置L201包括保持滤纸LP的纸架单元L202以及驱动该纸架单元L202的纸驱动单元L203。纸架

单元L202以沿前后方向滑动自如且装卸自如的方式安装于滴漏单元L21的底面，另一方面，纸驱动单元L203以沿前后方向滑动自如且装卸自如的方式安装于主体驱动单元L22的底面左端部。

[0600] 如图122、图123及图124所示，纸架单元L202具备以下部件等：比滴漏单元L21的缸L23的外径宽的带状的连续的滤纸LP；将该滤纸LP以能够送出的方式保持的架主体L204；设置于架主体L204的前侧上部的左右2个进纸滚筒L205、L205；以覆盖两个进纸滚筒L205、L205的方式安装于架主体L204的前端部的放纸门L206；设置于架主体L204的背面侧的纸用尽检测杆L207；以及内置于架主体L204的左侧壁且用于对进纸滚筒L205、L205进行旋转驱动的滚筒驱动机构L208。

[0601] 滤纸LP与咖啡提取用的一般的滤纸同样，是将植物纤维等编织得极细而制作成的，过滤程度比前述的滤网L72高。另外，滤纸LP具有纸卷部LPr，该纸卷部LPr呈纸卷状地卷绕在具有规定的内径的圆筒状的芯部LPs的周围。

[0602] 架主体L204形成为下表面和前表面下半部敞开的盒状，具备在内部收容滤纸LP的纸卷部LPr的塑料制的框架L211。如图123的(b)所示，框架L211的中央部从背面侧至前表面侧地形成为向上方凸的圆弧状，框架L211的前表面下半部被薄膜罩L212所覆盖，该薄膜罩L212安装于框架L211的顶面部且延伸到前表面下端部。另外，框架L211具有左右的侧壁L213、L213，在左侧的侧壁L213的外侧安装有罩L215。在两侧壁L213、L213，均在大致中央的左右对称的位置形成有具有规定的直径的圆形的开口L213a。而且，在各侧壁L213的外侧，经由开口L213a而安装有纸卷部支承构件L216，该纸卷部支承构件L216构成为相对于框架L211的内部出入自如，支承滤纸LP的纸卷部LPr。

[0603] 纸卷部支承构件L216由塑料的成形品构成，如图124所示，包括侧面形状为比上述开口L213a小一圈的圆形的凸部L216a以及从该凸部L216a向下方延伸且具有挠性的腿部L216b。凸部L216a配置成从侧壁L213的开口L213a向框架L211的内侧突出少许，在凸部L216a的下半部形成有以接近侧壁L213的方式朝向下方倾斜的倾斜面L216c。通过如以上那样构成的左右的纸卷部支承构件L216，滤纸LP的纸卷部LPr以在其芯部LPs插入有凸部L216a的状态被旋转自如地支承。

[0604] 另外，能够如下那样简单地进行滤纸LP相对于纸架单元L202的安装和拆卸。即，当将滤纸LP的纸卷部LPr从架主体L204的下方插入其内部时，纸卷部LPr的左右的端面与左右的纸卷部支承构件L216的凸部L216a的倾斜面L216c抵接，并将各凸部L216a按压到侧壁L213侧，由此，原本向内侧突出的各凸部L216a向侧壁L213侧退避。也就是说，两个凸部L216a、L216a向左右扩张(图124的(b)的双点划线所示的状态)。然后，在纸卷部LPr的芯部LPs到达凸部L216a的位置时，两个凸部L216a返回到内侧，与芯部LPs卡合。这样，仅通过将纸卷部LPr从下方插入到架主体L204就能够简单地进行滤纸LP的安装。

[0605] 另一方面，在更换滤纸LP时等要从纸架单元L202拆下滤纸LP的纸卷部LPr的情况下，在架主体L204内暂时顶起该纸卷部LPr。在该情况下，纸卷部LPr的芯部LPs的下半部的缘部与左右的纸卷部支承构件L216的倾斜面L216c抵接，由此与上述的滤纸LP的安装时同样地，左右的纸卷部支承构件L216的凸部L216a、L216a向左右扩张。然后，从该状态起，向斜下前方拉出纸卷部LPr。由此，纸卷部LPr经由架主体L204的前表面下半部被取出到前方。如以上那样，滤纸LP的拆卸也能够通过上述的过程来简单地进行。

[0606] 此外，各纸卷部支承构件L216在其腿部L216b处通过规定的防脱构件L217牢固地安装于框架L211的侧壁L213。因而，在上述的滤纸LP的安装和拆卸时，即使凸部L216a被纸卷部LPr按压，纸卷部支承构件L216也不会从框架L211的侧壁L213脱离。

[0607] 如图122和图123所示，左右的进纸滚筒L205、L205形状和尺寸彼此相同，跨架主体L204的左右的侧壁L213、L213之间沿左右方向延伸，且彼此在左右方向上隔开间隔地固定于被旋转自如地支承于两个侧壁L213、L213的滚筒轴L218。该进纸滚筒L205通过圆弧部L205a、直线部L205b以及小圆弧部L205c来形成为规定形状，其中，该圆弧部L205a具有规定的厚度和直径，该直线部L205b呈直线地与该圆弧部L205a的两端相连，该小圆弧部L205c突出设置于该直线部L205b的内侧缘部，具有比圆弧部L205a的直径小的直径。在圆弧部L205a，沿着其周向形成有大量的齿。

[0608] 放纸门L206具备沿左右方向延伸的门主体L221以及从该门主体L221的两端部呈直角地延伸、且侧面形状为大致弯折90度的左右的臂L222、L222。在门主体L221的背面固定有沿左右方向延伸的辊轴L223，在其两端部，旋转自如地支承有与两个进纸滚筒L205、L205分别对应的辊L224、L224。另外，在门主体L221的前表面安装有用于在利用滤纸LP排出提取渣时将该提取渣从滤纸LP分离的渣分离板L225。在纸架单元L202安装于滴漏单元L21的状态下，该渣分离板L225以从门主体L221向后上倾斜到滴漏单元L21的前侧的引导辊L38附近的方式延伸。

[0609] 左右的臂L222、L222以如下状态被旋转自如地支承：突出设置于其前端部的外表面的卡合凸部L222a从内侧被插入到形成于架主体L204的左右的侧壁L213的前端部的纵长的卡合孔L213b。另外，在各臂L222的长度方向上的大致中央部与对应的侧壁L213之间，安装有对放纸门L206向架主体L204侧施力的弹簧L226。并且，在各臂L222的靠门主体L221的规定位置设置有锁定部L222b，该锁定部L222b向外侧突出，用于通过与设置于对应的侧壁L213的前端上部的卡定部L213c卡定来将放纸门L206锁定为封闭的状态。

[0610] 滤纸LP被架主体L204的背面下端部的引导辊L204a和滴漏单元L21的后侧的引导辊L39所引导，经过缸L23与过滤块L32之间，再被滴漏单元L21的前侧的引导辊L38所引导，以在滴漏单元L21的前侧垂下的方式被放置。而且，滤纸LP的垂下的部分被如上述那样构成的左右的进纸滚筒L205、L205以及放纸门L206的两个辊L224、L224夹持。通过滚筒驱动机构L208对进纸滚筒L205、L205沿规定方向(图123的(b)中的顺时针方向)进行旋转驱动，由此从架主体L204内的纸卷部LPr侧给送如上述那样放置的滤纸LP。

[0611] 另外，如图122的(b)和图123的(b)所示，在两个进纸滚筒L205、L205中，在送出滤纸LP以外的待机时，各直线部L205b与对应的辊L224、L224相向。在该情况下，滤纸LP不被进纸滚筒L205与辊L224夹持。因而，在进行纸冲泡机LA的维护等时，能够通过手动来简单地将滤纸LP拉出到进纸滚筒L205和辊L224的下方。另外，即使在伴随提取咖啡时的过滤块L32的上升而滤纸LP被拉到过滤块L32侧的情况下，由于滤纸LP未被进纸滚筒L205和辊L224夹持，因此能够避免滤纸LP破损等不良状况。

[0612] 另外，在将滤纸LP放置在进纸滚筒L205与辊L224之间的情况下，如图123的(b)所示，通过使放纸门L206向前侧旋转来开放该放纸门L206，由此能够在进纸滚筒L205与辊L224之间确保比较大的空间。然后，在使滤纸LP通过该空间之后，将放纸门L206封闭为原来的状态。这样，能够通过开闭放纸门L206来简单地进行滤纸LP的上述放置。

[0613] 如图123的(b)和图125所示，纸用尽检测杆L207以沿左右方向水平地延伸的支轴L207a为中心来旋转自如地支承于架主体L204的框架L211的背面下端部。另外，纸用尽检测杆L207具有：长条的杆主体L207b，其从支轴L207a的右端部(图125的(a)的上端部)向上方延伸；以及检测杆部L207c，其从支轴L207a的左端部(图125的(a)的下端部)向斜下后方延伸少许。杆主体L207b位于框架L211的内侧，检测杆部L207c向框架L211的后方突出。另外，在纸用尽检测杆L207的支轴L207a的左端部安装有扭转弹簧L228，通过该扭转弹簧L228，沿图123的(b)中的顺时针方向对纸用尽检测杆L207施力。因而，如该图所示，在纸用尽检测杆L207中，杆主体L207b与滤纸LP的纸卷部LPr的外周面抵接，如图125的(b)所示，随着纸卷部LPr的直径的缩小，纸用尽检测杆L207追随该纸卷部LPr的直径的缩小而沿顺时针方向旋转。随之，检测杆部L207c向上方旋转，由纸驱动单元L203侧的后述的纸用尽检测开关L247检测出该情况。

[0614] 接着，说明对左右的进纸滚筒L205、L205进行旋转驱动的滚筒驱动机构L208。如图124所示，滚筒驱动机构L208设置于由架主体L204的左侧壁、即框架L211的左侧的侧壁L213和罩L215围起的空间。该滚筒驱动机构L208具备：前带轮L231，其固定于滚筒轴L218的从左侧的侧壁L213突出的端部；后带轮L232，其旋转自如地设置于左侧的侧壁L213的后端部；同步带L233，其卷绕于两个带轮L231、L232；以及从动齿轮L235，其固定于与后带轮L232共用的支轴L234，配置于后带轮L232与左侧的侧壁L213之间。通过纸驱动单元L203的后述的驱动齿轮L244，沿规定方向(图124的(a)的顺时针方向)对从动齿轮L235进行旋转驱动，由此后带轮L232沿相同方向旋转，因而，借助同步带L233，前带轮L231也沿相同方向旋转。由此，左右的进纸滚筒L205、L205如前述那样旋转来给送滤纸LP。

[0615] 另外，在框架L211的上述从动齿轮L235的附近设置有齿轮锁定机构L236，在纸架单元L202从滴漏单元L21被拆下而与纸驱动单元L203分离时，该齿轮锁定机构L236锁定从动齿轮L235。如图126所示，该齿轮锁定机构L236包括锁定构件L237以及对该锁定构件L237向后方(图126的左方)施力的弹簧L238。锁定构件L237具有：环部L237a，其形成为横长环状，包围与从动齿轮L235的侧面设置成一体的毂部L235a的周围；以及滑动部L237b，其从该环部L237a向前方延伸，沿前后方向滑动自如地支承于框架L211的左侧的侧壁L213。另外，在环部L237a的内侧的前端部设置有向后方突出的锁定凸部L239。

[0616] 另一方面，在从动齿轮L235的毂部L235a的周面的规定位置形成有向外侧开口的卡合凹部L235b。在从动齿轮L235位于待机位置时，如图126所示，该卡合凹部L235b与锁定构件L237的锁定凸部L239相向。

[0617] 在如上述那样构成的齿轮锁定机构L236中，如图126的(a)所示，在纸架单元L202和纸驱动单元L203处于彼此分离的状态时，锁定构件L237被弹簧L238施力，锁定凸部L239与从动齿轮L235的卡合凹部L235b嵌合。由此，从动齿轮L235被锁定。另一方面，在纸架单元L202和纸驱动单元L203彼此连结的状态下，纸驱动单元L203的前端部的锁定构件抵接部L241a从后方与锁定构件L237的环部L237a抵接，抵抗弹簧L238的施力来将锁定构件L237向前方按压。由此，锁定构件L237的锁定凸部L239从从动齿轮L235的卡合凹部L235b脱离，其结果，从动齿轮L235成为能够旋转的状态。

[0618] 这样，在从纸驱动单元L203拆下了纸架单元L202时，从动齿轮L235被锁定，因此除了与其成一体的后带轮L232被锁定以外，经由同步带L233与其连结的前带轮L231也被锁

定。其结果，固定于与前带轮L231共用的旋转轴即滚筒轴L218的两个进纸滚筒L205、L205也被锁定。由此，在从纸驱动单元L203拆下了纸架单元L202的状态下，能够以使各进纸滚筒L205的直线部L205b与对应的辊L224相向的方式锁定进纸滚筒L205。

[0619] 如前所述，优选的是，在待机时，进纸滚筒L205停止为直线部L205b与辊L224相向。因而，在进行维护等时，在纸架单元L202从纸驱动单元L203被拆下、再次安装于纸驱动单元L203之前，能够保持进纸滚筒L205的停止角度位置，因此能够确保待机时的进纸滚筒L205的上述停止角度位置。另外，仅通过将纸架单元L202安装于纸驱动单元L203就能够简单地进行进纸滚筒L205的锁定的解除。

[0620] 图127示出了纸驱动单元L203，而图128示出了纸驱动单元L203的内部构造并且示出了纸架单元L202。如两图所示，纸驱动单元L203具备：电动机L242，其配置于构成该纸驱动单元L203的外廓的外壳L241内的后部；齿轮箱L243，其与该电动机L242连接，安装于外壳L241的右侧面；以及驱动齿轮L244，其配置于外壳L241内的前部，固定于沿齿轮箱L243的左右方向(图128的表里方向)延伸的输出轴L243a。在驱动齿轮L244的左侧面设置有在规定位置具有卡合凹部L245a的凸轮L245。另外，在驱动齿轮L244的后方配置有进纸检测开关L246，该进纸检测开关L246由利用凸轮L245来进行接通/断开切换的微动开关构成。该进纸检测开关L246在其操作杆L246a的前端部具有开关辊L246b，通过该开关辊L246b被按压到驱动齿轮L244的凸轮L245的周面，该进纸检测开关L246成为接通状态，通过开关辊L246b与凸轮L245的卡合凹部L245a相向而被解除按压，该进纸检测开关L246成为断开状态。

[0621] 另外，在纸驱动单元L203，在外壳L241的下端部设置有由微动开关构成的纸用尽检测开关L247，在其下侧配置有对该纸用尽检测开关L247进行接通/断开切换的切换杆L248。纸用尽检测开关L247在其操作杆L247a的顶端部具有开关辊L247b，通过利用切换杆L248从下方按压该开关辊L247b，纸用尽检测开关L247成为接通状态，通过该按压被解除，纸用尽检测开关L247成为断开状态。

[0622] 如图128的(a)所示，切换杆L248沿前后方向延伸，以后端部(该图的左端部)的支点L248a为中心在将纸用尽检测开关L247切换为接通状态的接通切换位置(图128的(a)所示的位置)与将纸用尽检测开关L247切换为断开状态的断开切换位置(图128的(b)所示的位置)之间旋转自如地支承于外壳L241。另外，在切换杆L248的前端部设置有沿斜上和斜下延伸的两岔状的卡合部L248b。并且，在切换杆L248的支点L248a设置有扭转弹簧L249，利用该扭转弹簧L249对切换杆L248沿图128中的逆时针方向施力。

[0623] 因而，如图128的(a)所示，在纸架单元L202与纸驱动单元L203分离的状态下，纸用尽检测开关L247被切换杆L248从下方按压，成为接通状态。另一方面，如图128的(b)所示，在纸架单元L202安装于纸驱动单元L203的状态下，纸架单元L202侧的纸用尽检测杆L207的检测杆部L207c与纸驱动单元L203侧的切换杆L248的前端部的卡合部L248b卡合。

[0624] 如图123的(b)所示，在滤纸LP的余量充分的情况下，纸用尽检测杆L207的下端部的检测杆部L207c位于向后方斜下延伸的位置。在该情况下，如图128的(b)所示，检测杆部L207c与纸驱动单元L203的切换杆L248的卡合部L248b卡合来将其按压到下方。由此，切换杆L248位于断开切换位置，其结果，纸用尽检测开关L247处于断开状态，因此由控制部判别为纸未用尽。

[0625] 另一方面，当因提取咖啡而使用滤纸LP、随之滤纸LP的纸卷部LPr的直径如图125

的(b)的双点划线所示那样变小而达到规定的直径时，纸用尽检测杆L207的下端部的检测杆部L207c位于大致水平地延伸的位置。由此，检测杆部L207c对纸驱动单元L203侧的切换杆L248的按压被解除。由此，由于扭转弹簧L249的施力，切换杆L248位于接通切换位置，其结果，纸用尽检测开关L247处于接通状态，因此由控制部判别为纸用尽。

[0626] 另外，上述的纸用尽检测杆L207除了用于判别纸用尽以外，还用于判别纸架单元L202是否适当地安装于纸驱动单元L203。即，在从纸驱动单元L203拆下了纸架单元L202时，如图128的(a)所示，纸驱动单元L203的切换杆L248位于接通切换位置，纸用尽检测开关L247为接通状态。在从该状态起纸架单元L202适当地安装于纸驱动单元L203时，如图128的(b)所示，纸用尽检测杆L207的检测杆部L207c与纸驱动单元L203侧的切换杆L248的卡合部L248b卡合来将其按压到下方。由此，切换杆L248位于断开切换位置，其结果，纸用尽检测开关L247从接通状态变为断开状态，因此由控制部判别为适当地安装了纸架单元L202。

[0627] 另一方面，在纸架单元L202未适当地安装于纸驱动单元L203时，纸用尽检测杆L207的检测杆部L207c不会适当地与纸驱动单元L203侧的切换杆L248卡合，由此切换杆L248维持为接通切换位置，其结果，纸用尽检测开关L247保持为接通状态。也就是说，在将纸架单元L202安装于纸驱动单元L203时，本来纸用尽检测开关L247应该变为断开状态，但是纸用尽检测开关L247保持为接通状态，由此能够判别为未适当地安装纸架单元L202。如以上那样，能够利用纸用尽检测杆L207来容易地判别纸架单元L202是否适当地安装于纸驱动单元L203。

[0628] 接着，参照图129～图133的流程图和图134～图164的动作图来说明如以上那样构成的冲泡机构L的动作。此外，在动作图中，设上层以凸轮圆板L55的旋转动作为中心来表示，下层以过滤块L32和缸盖L101的动作为中心来表示。另外，在下面说明中，首先参照图134～图144的动作图来说明利用纸冲泡机LA进行的咖啡的烹调动作，之后说明利用网冲泡机LB进行的咖啡的烹调动作。

[0629] 图129示出了在具备纸冲泡机LA或网冲泡机LB的杯式自动售货机1中存在销售指令时的销售动作的执行处理(主例程)，该销售指令基于由使用者利用咖啡的商品选择按钮进行的操作。该控制程序与具备纸冲泡机LA和网冲泡机LB中的任一个的情况均对应，对于两个冲泡机LA和LB而言被共同化。

[0630] 另外，图134示出了纸冲泡机LA的待机状态。在该待机状态下，凸轮圆板L55、过滤块L32以及缸盖L101位于各自的待机位置，并且缸L23的上表面和下表面均被开放。此外，在该待机状态下，如图165的(1)所示，第一空气夹紧件L8A、第二空气夹紧件L8B以及饮料夹紧件L8C均为开放状态，因而，与夹紧件L8A～L8C分别对应的输送管L9A～L9C均被开放。

[0631] 在图129所示的销售动作的主例程中，首先在步骤LS1(图示为“LS1”。以下相同)中，执行提取渣排出用初始处理(副例程)。图130示出了提取渣排出用初始处理。如该图所示，在本副例程中，首先判别是否存在滤纸LP(步骤LS21)。具体地说，根据是否纸驱动单元L203安装于冲泡机主体L20而该纸驱动单元L203的电动机L242与控制部电连接来进行判别。由于纸冲泡机LA具备纸驱动单元L203，因此上述步骤LS21的判别结果为“是”，直接结束本副例程。

[0632] 返回到图129的主例程，在步骤LS2中，使过滤块L32上升。具体地说，在主体驱动单元L22中，凸轮驱动机构L104的第一电动机L121沿规定方向旋转，由此滴漏单元L21的凸轮

圆板L55沿图134中的顺时针方向旋转。由此，与凸轮圆板L55的第一凸轮槽L53卡合的滑动件L56上升，被该滑动件L56支承的过滤块L32与其上侧的滤纸LP一起上升。在该情况下，在滑动件L56的上升中途，滑动件L56的长孔L56b的下缘部与废液管夹紧构件L58的卡合凸部L58a抵接，之后，随着滑动件L56的上升，废液管夹紧构件L58也上升。然后，如图135所示，凸轮圆板L55从待机位置旋转约180度，由此过滤块L32以将滤纸LP压到缸L23的下表面的状态将缸L23的下表面密封。另外，在该情况下，废液管夹紧构件L58在其按压部L58b与压紧弹簧L59之间挤压废液管L50，由此将其封闭。

[0633] 接着，在该状态下，从罐D10和温水箱F分别向缸L23内供给规定量的原料(例如10g)和热水(例如105ml)(步骤LS3)。具体地说，原料经由架罩L37的原料投入口L37a和缸盖L101的辅助原料滑槽L115供给到缸L23。另外，在由使用者操作咖啡的增量按钮来执行后述的大容量提取的情况下，向缸L23供给比上述多的原料(例如15g)。另一方面，热水经由架罩L37的热水供给口L37b和缸盖L101的辅助热水供给喷嘴L116a供给到缸L23。此外，在该原料/热水的供给状态下，如图165的(2)所示，仅第二空气夹紧件L8B为开放状态，其它夹紧件L8A和L8C均变为封闭状态。

[0634] 另外，在供给原料和热水后，保持上述的状态，使空气泵L107工作规定时间，由此向缸L23供给搅拌用空气(步骤LS4)。具体地说，空气从空气泵L107经由第二空气输送管L9B和过滤块管L32a被送到过滤块L32。由此，该空气通过过滤块L32的滤网L72和滤纸LP，对缸L23内的原料和热水进行搅拌。

[0635] 在上述搅拌结束后，如图136所示，从温水箱F向缸L23内供给规定量的热水(例如50ml)来作为后热水(步骤LS5)。通过像这样供给后热水，即使在供给原料时原料附着于缸L23的内表面上部的情况下，也能够利用后热水使该原料从缸L23的内表面脱离。其结果，能够在咖啡的烹调中有效使用供给到缸L23的所有原料，并且防止附着于缸L23的原料在下一次销售时被使用，由此能够在下一次销售中烹调优质的咖啡。

[0636] 接着，在主体驱动单元L22中，缸盖/刮刀驱动机构L105的第二电动机L131沿规定方向旋转，由此缸盖驱动部旋转规定角度(例如180度)，由此，待机位置的缸盖L101前进(步骤LS6)。具体地说，如图137所示，缸盖L101的盖主体L111到达缸L23的正上方。然后，保持该状态，使空气泵L107再次工作规定时间，由此与上述的搅拌同样地向缸L23供给搅拌用空气(步骤LS7)。通过以上，在缸L23的内部提取咖啡。

[0637] 接着，凸轮驱动机构L104的第一电动机L121再次旋转，由此凸轮圆板L55进一步旋转。然后，如图138所示，凸轮圆板L55从待机位置旋转约240度，由此与凸轮圆板L55的第二凸轮槽L54卡合的缸盖锁定构件L57沿该图中的顺时针方向旋转少许，利用其锁定部L57b将盖引导棒L113向下方压下，锁定缸盖L101(步骤LS8)。由此，缸盖L101以盖主体L111与缸L23的上表面抵接的状态将其密封。此外，在该状态下，如图165的(3)所示，第一空气夹紧件L8A和饮料夹紧件L8C为开放状态，另一方面，第二空气夹紧件L8B为封闭状态。

[0638] 然后，在步骤LS9中，执行咖啡的提取处理(副例程)。图131示出了咖啡提取处理。如该图所示，在本副例程中，首先与前述的步骤LS21同样地，判别是否存在滤纸LP(步骤LS31)。在纸冲泡机LA中，步骤LS31的判别结果为“是”，在接下来的步骤LS32中，判别是否进行大容量提取。该大容量提取是在由使用者操作咖啡的增量按钮时执行的咖啡的提取处理。

[0639] 在未操作咖啡的增量按钮时(步骤LS32:“否”),进入步骤LS33,使空气泵L107工作规定时间,由此向缸L23供给运出用空气(步骤LS33)。具体地说,空气从空气泵L107经由第一空气输送管L9A被送到缸盖L101,并供给到缸L23。缸L23内被该空气加压,在内部提取出的咖啡被滤纸LP和滤网L72过滤,依次经过过滤块L32、过滤块管L32a、饮料输送管L9C、搅拌碗M以及饮料管L16后,被供给到放置于烹调位置的杯W。

[0640] 另一方面,在操作了咖啡的增量按钮时(步骤LS32:“是”),进入步骤LS34,执行大容量提取处理(副例程)(步骤LS34)。图132示出了大容量提取处理。如该图所示,在本副例程中,首先与上述的图131的步骤LS33同样地,向缸L23供给运出用空气(第1次)(步骤LS41)。由此,在缸L23内提取出的咖啡作为通过第1次提取得到的咖啡被供给到杯W。但是在该情况下,优选的是,在缸L23内的咖啡被完全运出之前,停止空气泵L107,利用已供给到缸L23的空气的余压来进行咖啡的运出。由此,能够降低原料的微粉末与咖啡一起被运出而供给到杯W的情况,由此,能够向杯W供给无杂味的优质的咖啡。

[0641] 接着,凸轮驱动机构L104的第一电动机L121沿与上述相反的方向旋转,由此凸轮圆板L55也沿反方向旋转规定角度(约60度、从待机位置来看约180度)。在该情况下,如图139所示,缸盖锁定构件L57对盖引导棒L113的锁定被解除,由此解除缸盖L101的锁定(步骤LS42)。此外,在该情况下,该盖引导棒L113被凸轮圆板L55的凸部L55b顶起。

[0642] 接着,缸盖/刮刀驱动机构L105的第二电动机L131沿与上述相同的方向旋转,由此缸盖驱动部进一步旋转规定角度(例如180度),由此如图143所示,缸盖L101后退,返回到待机位置(步骤LS43)。由此,缸L23的上表面被开放。然后,从温水箱F向缸L23内供给规定量的热水(例如140ml)作为追加热水(步骤LS44)。

[0643] 另外,在供给追加热水后,与步骤LS4同样地,向缸L23供给搅拌用空气(步骤LS45),对缸L23内的现有的原料和追加热水进行搅拌。在该搅拌结束后,与步骤LS6和步骤LS8同样地,使待机位置的缸盖L101前进到缸L23的正上方(步骤LS46),并且将该缸盖L101锁定(步骤LS47)。由此,如图144所示,缸L23的上表面被缸盖L101密封。然后,与图131的步骤LS33同样地,向缸L23供给运出用空气(第2次)(步骤LS48)。由此,在缸L23内提取出的咖啡作为通过第2次提取得到的咖啡被供给到杯W。

[0644] 返回到图129的主例程,在上述的步骤LS9的咖啡提取处理结束后,与图132的步骤LS42同样地,解除缸盖L101的锁定(步骤LS10),之后,与步骤LS43同样地,缸盖L101后退,返回到待机位置(步骤LS11)。

[0645] 接着,保持上述的状态,如图140所示,从温水箱F向缸L23投入规定量的热水(例如8ml)来作为用于清洗缸L23的内表面的冲洗热水(第1次)(步骤LS12)。如前所述,根据缸L23的内部的形状以及位于待机位置的缸盖L101的辅助热水供给喷嘴L116a的位置关系,经由辅助热水供给喷嘴L116a投入到缸L23的冲洗热水一边沿着缸L23的内表面且沿周向扩散一边流下。由此,在从缸L23运出咖啡之后,附着于缸L23的内表面的提取渣与冲洗热水一起向下方流下。

[0646] 之后,凸轮驱动机构L104的第一电动机L121沿与上述相同的方向旋转,由此凸轮圆板L55旋转规定角度(约180度),由此,如图141所示,过滤块L32下降(步骤LS13),返回到待机位置。在该情况下,提取渣LG残留于过滤块L32上的滤纸LP。然后,保持该状态,如该图所示,从温水箱F进一步向缸L23投入规定量的热水(例如10ml)来作为冲洗热水(第2次)(步

骤LS14)。通过该第2次的冲洗热水，原本附着/残留于缸L23的下端部的提取渣LG被冲洗，落下到滤纸LP上。

[0647] 然后，执行提取渣排出处理(副例程)(步骤LS15)，结束图129的主例程，返回到待机状态。图133示出了提取渣排出处理。如该图所示，在本副例程中，首先，与前述的步骤LS21同样地，判别是否存在滤纸LP(步骤LS51)。在纸冲泡机LA中，该步骤LS51的判别结果为“是”，将滤纸LP给送规定长度(步骤LS52)，由此，如图142所示，将滤纸LP上的提取渣LG排出到前方。在该情况下，如该图所示，利用纸架单元L202的渣分离板L225将提取渣LG从滤纸LP分离。然后，所排出的提取渣LG被收容到下方的渣桶。

[0648] 通过以上，具备纸冲泡机LA的杯式自动售货机1LA所进行的咖啡的销售结束。

[0649] 接着，参照图145～图164的动作图来说明利用网冲泡机LB进行的咖啡的烹调动作。相对于上述的纸冲泡机LA，在利用该网冲泡机LB进行的咖啡的烹调动作中，仅图129的主例程中的步骤LS1、步骤LS9以及步骤LS15这3个副例程不同，其它控制与上述的纸冲泡机LA共同。因而，在下面的说明中，以这些副例程为中心来进行说明。

[0650] 另外，在网冲泡机LB中，能够预先将提取渣的排出方向设定成排出到滴漏单元L21的前方或后方，并且能够设定成每隔规定次数(例如1次～10次)交替地排出到前方和后方。因而，在下面说明中，首先，参照图145～图155的动作图来说明提取渣的排出方向被设定为前方的网冲泡机LB(以下适当称为“前排出网冲泡机LB”)的动作，之后参照图156～图164的动作图来说明提取渣的排出方向被设定为后方的网冲泡机LB(以下适当称为“后排出网冲泡机LB”)的动作。

[0651] 图145示出了前排出网冲泡机LB的待机状态。在该待机状态下，与上述的纸冲泡机LA同样地，凸轮圆板L55、过滤块L32以及缸盖L101位于各自的待机位置，除此以外，刮刀L102位于过滤块L32的后方的待机位置。

[0652] 如图129所示，在销售动作的主例程中，首先，在步骤LS1中，执行作为副例程的提取渣排出用初始处理，在本副例程中，如图130所示，判别是否存在滤纸LP(步骤LS21)。在本例中，网冲泡机LB不具备纸驱动单元L203，因此上述步骤LS21的判别结果为“否”，进入步骤LS22，判别利用刮刀L102排出提取渣的排出方向是否为前方(步骤LS22)。在本例的前排出网冲泡机LB中，提取渣的排出方向被设定为前方，因此上述步骤LS22的判别结果为“是”，直接结束本副例程。

[0653] 返回到图129的主例程，执行步骤LS2～步骤LS8。图146、图147、图148、图149分别与作为前述的纸冲泡机LA的动作图的图135、图136、图137、图138对应。

[0654] 接着，在步骤LS9中，执行作为副例程的咖啡提取处理，在本副例程中，如图131所示，判别是否存在滤纸LP(步骤LS31)。在本例中，上述步骤LS31的判别结果为“否”，执行步骤LS33，结束本副例程。通过执行该步骤LS33，在缸L23内提取出的咖啡被滤网L72过滤后被供给到烹调位置的杯W。

[0655] 返回到图129的主例程，执行步骤LS10～步骤LS14。图150、图151、图152分别与作为前述的纸冲泡机LA的动作图的图139、图140、图141对应。此外，在本例中，在步骤LS13中，凸轮圆板L55旋转到超过待机位置的角度位置(从待机位置来看约-40度)。在该情况下，如图152所示，滑动件L56借助卡合凸部L56a来与凸轮圆板L55的第一凸轮槽L53的接近部L61a卡合。通过以上，过滤块L32暂时下降至待机位置之后，上升到比该位置高少许的位置后停

止，提取渣LG残留于其滤网L72上。

[0656] 接着，在步骤LS15中，执行作为副例程的提取渣排出处理。在本副例程中，如图133所示，判别是否存在滤纸LP(步骤LS51)，在本例中，该判别结果为“否”，进入步骤LS54。在该步骤LS54中，判别提取渣的排出方向是否被设定为前方。在本例中，该判别结果为“是”，位于待机位置的刮刀L102前进，将提取渣LG排出到前方(步骤LS57)。具体地说，缸盖/刮刀驱动机构L105的第二电动机L131沿规定方向旋转，由此刮刀驱动部L133旋转约180度。由此，如图153所示，刮刀L102从待机位置移动至前方的提取渣排出位置。在该情况下，刮刀主体L102b的下端一边与过滤块L32的滤网L72滑动接触，一边刮下滤网L72上的提取渣LG，将该提取渣LG排出到前方。

[0657] 另外，在该提取渣LG排出到前方之后，凸轮驱动机构L104的第一电动机L121沿规定方向旋转，由此，凸轮圆板L55沿图151中的顺时针方向旋转规定角度(例如约40度)，返回到待机位置。由此，如图154所示，过滤块L32下降少许，返回到待机位置(步骤LS58)。在该状态下，在过滤块L32的滤网L72与刮刀主体L102b的下端之间确保了间隙。

[0658] 之后，缸盖/刮刀驱动机构L105的第二电动机L131沿与上述相同的方向旋转，由此刮刀驱动部L133旋转约180度。由此，如图155所示，刮刀L102后退，返回到待机位置(步骤LS59)。

[0659] 通过以上，具备前排出网冲泡机LB的杯式自动售货机1LB所进行的咖啡的销售结束。

[0660] 接着，说明提取渣的排出方向被设定为后方的后排出网冲泡机LB的动作。图156示出了后排出网冲泡机LB的待机状态。此外，该待机状态与上述的前排出网冲泡机LB相同，刮刀L102位于后方的待机位置。

[0661] 如图129所示，在销售动作的主例程中，首先，在步骤LS1中，执行作为副例程的提取渣排出用初始处理，在本副例程中，进行图130的步骤LS21和步骤LS22的判别。该步骤LS22判别利用刮刀L102排出提取渣的排出方向是否为前方，在本例的网冲泡机LB中，提取渣的排出方向被设定为后方，因此上述步骤LS22的判别结果为“否”，进入步骤LS23。

[0662] 在该步骤LS23中，缸盖/刮刀驱动机构L105的第二电动机L131沿规定方向旋转，由此刮刀驱动部L133旋转约180度。由此，如图157所示，刮刀L102从待机位置移动至前方的与前述的提取渣排出位置相同的位置(以下称为“前侧待机位置”)。

[0663] 返回到图129的主例程，执行步骤LS2～步骤LS14。图158、图159～图161及图162、图163分别与作为进行提取渣的前方排出的前述的前排出网冲泡机LB的动作图的图146、图148～图150、图151、图152对应。

[0664] 接着，在步骤LS15中，执行作为副例程的提取渣排出处理，在本副例程中，进行图133的步骤LS51和步骤LS54的判别。该步骤LS54判别提取渣的排出方向是否为前方，在本例的后排出网冲泡机LB中，提取渣的排出方向被设定为后方，因此上述步骤LS54的判别结果为“否”，进入步骤LS55。

[0665] 在该步骤LS55中，缸盖/刮刀驱动机构L105的第二电动机L131沿与上述相同的方向旋转，由此刮刀驱动部L133旋转约180度。由此，如图164所示，刮刀L102从前侧待机位置向后方移动，由此将提取渣LG排出到后方，返回到待机位置。

[0666] 之后，凸轮驱动机构L104的第一电动机L121沿规定方向旋转，由此凸轮圆板L55沿

图164中的顺时针方向旋转规定角度(例如约40度)。由此,过滤块L32下降少许,返回到待机位置(步骤LS56,参照图156)。

[0667] 通过以上,具备后排出网冲泡机LB的杯式自动售货机1LB所进行的咖啡的销售结束。

[0668] 接着,说明滤网L72。

[0669] 如图168和图169所示,作为过滤器组装品的滤网L72具有圆板状的过滤器主体L721、设置于其下侧的保持板(金属板)L722以及用于将它们相互固定的固定框L723。过滤器主体L721具有网部L721a和遍及网部L721a的整个外周部地设置的凸缘部L721b,该网部L721a由极薄的金属材料构成,具有比缸L23的内径小少许的外径。该凸缘部L721b从自网部L721a的外周部垂下的垂下部的下端向侧方突出。

[0670] 如图170、图171所示,网部L721a是厚度Lt0为50μm的非常薄的金属,在该网部L721a的整面形成有大量的直径LΦ0为100μm且深度d1为5～10μm的浅凹(洼坑)L721d。使孔径LΦ1为30μm以下(例如,20μm)的用于过滤饮料的大量的过滤孔(贯通孔)L721c贯通该浅凹L721d的中心。由于浅凹L721d具有深度d1为5μm～10μm的浅凹构造,因此在利用刮刀L102排出提取渣时,在该浅凹(洼坑)L721d处构成热水水膜,由此能够降低刮刀L102的滑动阻力。

[0671] 该过滤孔L721c以贯通过滤器主体L721的下表面(背面)L721f的方式开口,并且设为随着去向下表面L721f而直径扩大的放射状的曲面锥构造L721g(例如,曲面半径为40μm的锥状扩大形状),使下表面L721f的面积成为比刮刀L102的滑动面的面积小的面积。通过像这样将过滤孔L721c设为随着去向下表面L721f而直径扩大的放射状的曲面锥构造L721g,能够将过滤孔L721c的与浅凹L721d面相对的孔入口部分的前端部作为刀口L721h,从而在使刮刀L102滑动来对提取渣进行废弃时,对于堵在过滤孔L721c的提取渣(粉末原料的微粉),由刮刀L102前端部与过滤孔L721c的刀口L721h协作来使剪切力强力地起作用从而切断并排出提取渣,防止过滤孔L721c的闭塞。并且,通过设为曲面锥构造L721g,能够使通过液流无法冲洗的下表面L721f的面积为极小的面积。

[0672] 而且,通过电铸加工来形成这些浅凹L721d、过滤孔L721c、曲面锥构造L721g,将其加工面(过滤器孔内表面和下表面L721f)加工成平滑的镜面。由此,下表面L721f能够防止饮料提取液的污垢的附着、堆积,能够防止由污垢引起的饮料味道的劣化来维持味道,还能够保持卫生。

[0673] 通过使过滤孔L721c的孔径LΦ1为30μm以下且将过滤孔L721c的内表面加工成平滑的镜面,过滤孔L721c能够将饮料过滤时的液流流速确保为固定以上,防止附着于孔内表面的污垢在孔内产生架桥现象,能够在饮料过滤时冲掉附着于孔内表面的污垢,能够维持孔内表面的清洗功能。当该过滤孔的直径大(例如,70μm)时,饮料过滤时的液流流速变慢,因此难以在饮料过滤时冲掉附着于孔内表面的污垢。

[0674] 通过将过滤孔L721c的内表面加工成平滑的镜面,能够不去除咖啡豆的油分地过滤咖啡,因此能够过滤出包含香味成分的咖啡,该香味成分在利用滤纸LP的情况下是被去除的。

[0675] 另外,过滤孔L721c小至孔径LΦ1为30μm以下,因此能够将原料中包含的微粉完全分离地过滤饮料,过滤后的饮料中不再留有残渣,因此能够过滤出具有滤纸时的透明度以

上的透明度的饮料，并能够使饮料的过滤时间稳定。

[0676] 并且，也可以如图172所示那样，使过滤孔L721c的直孔(垂直部)L721e的深度d2为15μm以下。通过像这样将过滤孔L721c设为15μm以下的直孔L721e，对于堵在过滤孔L721c的提取渣(粉末原料的微粉)，能够由刮刀L102前端部与过滤孔L721c入口部分的前端部的边缘协作来使剪切力强力地起作用从而切断并排出提取渣，防止过滤孔L721c的闭塞，并且能够提高过滤器主体L721的耐久性。

[0677] 保持板L722具有圆板状的支承部L722a以及遍及其整个外周部地设置的截面呈L字形的固定部L722c。该固定部L722c从自支承部L722a的外周部向下方垂下的垂下部的下端部向侧方突出。另外，支承部L722a的直径比网部L721a小少许。另外，支承部L722a的厚度被设定成对于在缸盖/刮刀驱动机构L105工作时作用的载荷而言能够确保足以维持支承部L722a的形状的刚性。另外，在支承部L722a的大致整面形成有大量的孔L722b，孔L722b配置为网状，具有远比前述的网部L721a的过滤孔L721c大的直径(例如4mm)。

[0678] 固定框L723由侧壁L723a以及从其上端部向内侧突出的上壁L723b形成为环状。保持板L722以将过滤器主体L721夹在中间的状态与该固定框L723嵌合，保持板L722的固定部L722c被压入到固定框L723的侧壁L723a的内侧，由此，过滤器主体L721的凸缘部L721b被夹在上壁L723b与固定部L722c之间，这三者被一体化。另外，在该状态下，保持板L722的支承部L722a的整个上表面与过滤器主体L721的网部L721a抵接。

[0679] 如以上那样，根据滤网L72，能够将饮料过滤时的液流流速确保为固定以上，能够防止附着于孔内表面的污垢在孔内产生架桥现象，能够在饮料过滤时冲掉附着于孔内表面的污垢，能够维持孔内表面的清洗功能。另外，能够将原料中包含的微粉完全分离地过滤饮料，过滤后的饮料中不再留有残渣，因此能够过滤出具有滤纸时的透明度以上的透明度的饮料，并能够使饮料的过滤时间稳定。并且，对于堵在过滤孔L721c的提取渣，能够由刮刀L102前端部与过滤孔L721c入口部分的前端部的边缘协作来使剪切力强力地起作用从而切断并排出提取渣，防止过滤孔L721c的闭塞，并且能够提高滤网L72的耐久性。

[0680] <搅拌碗M>

[0681] 首先，参照图173来说明搭载有搅拌碗M的杯式自动售货机1。图173所示的杯式自动售货机1被定位为中型，在顶面左端设置有库内灯M100，在其之下沿着左壁设置有制冰机G。在制冰机G的右侧设置有储液器E，在储液器E安装有与温水箱F相连的水泵E1。在制冰机G的下侧，在左壁的中间设置有饮用水用的水泵E1。制冰机G配置于杯式自动售货机1的里侧。在制冰机G的前侧设置有提取原料供给机构D-2、研磨机K以及冲泡机构L，但是在图173中省略了。

[0682] 在地板面左端设置有冷却单元N，在其上侧且水泵E1的下侧设置有冷却水槽N1。

[0683] 在杯式自动售货机1的内部，在地板面配置贮存有糖浆原液的多个盒中袋(bag in box)P7～P9，并根据需要配置1个以上的筒式的供水箱E32。盒中袋P7～P9的糖浆原液被独立的糖浆泵P1～P3吸出，供水箱E32的饮用水被辅助泵E30吸出，分别供给到储液器E、制冰机G以及烹调位置等。

[0684] 在杯式自动售货机1的内部，在上部的大致右半部分设置有粉末原料供给机构D-1。在粉末原料供给机构D-1的左侧面的下半部分设置有搅拌机构J。在粉末原料供给机构D-1的里侧配置有温水箱F。此外，在粉末原料供给机构D-1的前侧设置有杯供给机构C，但是在

图173中省略了。

[0685] 在粉末原料供给机构D-1的多个罐D10中的最右侧的罐之下安装有搅拌碗M。

[0686] 图174是搅拌碗M的截面侧视图，图175是图174中的c8-c8线剖视图。搅拌碗M包括搅拌容器M11以及安装搅拌容器M11的盖主体M12，搅拌碗M通过盖主体M12而被支承在杯式自动售货机1内。另外，在盖主体M12，在中央部安装有搅拌装置M20的搅拌电动机M21，并且设置有经由温水箱F的热水阀来与热水管路连接的热水导入口M13、经由滑槽D20来导入罐D10中贮存的粉末原料的原料投入口M17以及与图外的风扇相连的排气通路M18。

[0687] 并且，在盖主体M12的外周面，呈环状地形成有利用热水通路M13a来与热水导入口M13相连的热水流下槽M14。在构成该热水流下槽M14的周壁M15设置有突起M15a(参照图176)，热水从构成于搅拌容器M11的内表面M11a与突起M15a之间的间隙M16沿搅拌容器M11的内表面M11a流下。进行调整使得供给到热水导入口M13的热水量比从间隙M16流下的热水量多。因此，冲洗热水遍及整个热水流下槽M14地从整个间隙M16流下。

[0688] 搅拌装置M20包括铅直轴M23以及分别安装于铅直轴M23的烹调用搅拌叶片M24和阀叶片M25，该铅直轴M23的上端部经由接头M22来与搅拌电动机M21连结。烹调用搅拌叶片M24和阀叶片M25具有伴随旋转来阻止混合液或热水流下的阀的功能，并且具有对粉末原料与热水进行搅拌、混合(烹调)的功能。

[0689] 搅拌容器M11由合成树脂形成为变形漏斗状，使得能够高效地进行饮料的搅拌，在其内部具有搅拌装置M20。搅拌容器M11的上端部敞开得大，以与盖主体M12嵌合的方式装卸自如地安装于盖主体M12。另外，安装有下部具有喷出口M19a的饮料注出部M19。搅拌装置M20的铅直轴M23的轴端被该饮料注出部M19覆盖，并且烹调后的饮料由该饮料注出部M19注入到杯W。

[0690] 另外，通过对搅拌容器M11的内表面M11a涂敷亲水性材料，内表面M11a对水的接触角(以下也称为水接触角)形成为50°以下的大小、优选为5°以上且20°以下的大小。能够通过如下的方法来像这样将水接触角形成为特定的范围。例如，在将含有氧化钛微粒子的Hydrotect涂层(TOTO制)用作亲水性材料的情况下，能够通过向搅拌容器M11定期地照射紫外光至可见光来将水接触角保持为10°左右。另外，在将含有聚硅氮烷(polysilazane)的亲水化材料(CLARIANT JAPAN制)用作亲水性材料的情况下，在涂敷该亲水化材料之后，在加热或高温高湿环境下使涂膜进行硅转化，由此能够使水接触角为约20°以下。在使用该亲水化材料进行涂敷的情况下，具有以下优点：能够形成如石英那样的硬质的膜，在将搅拌容器M11拆下来清洗时难以被划伤等。

[0691] 流过使内表面M11a亲水化后的搅拌容器M11的冲洗热水如图177所示那样在整个内表面M11a流下，来冲掉附着于内表面M11a的饮料(图177中的空心星形)，因此能够维持搅拌容器M11的内表面M11a的清洁性。

[0692] 图178示出了搅拌容器M11的饮料附着量与饮料销售(烹调)次数之间的关系。在该图中示出了：与以往使用的成型品的内表面(例如，聚丙烯)相比，在对内表面M11a以使水接触角为约20°的方式进行亲水化的情况下，即使饮料销售次数增加，饮料附着量也少。

[0693] <冷却单元N>

[0694] 如图179所示，冷却单元N是用于对制冰机G和冷却水槽N1进行冷却的冷冻回路。冷却单元N为以下结构：冷却水槽N1、压缩机N2侧的制冷剂配管与制冰机G侧的制冷剂配管之

间能够借助联接器等装卸机构部N3、N4进行装卸。

[0695] 冷却单元N具备压缩机N2、冷凝器N5、设置于冷却水槽N1的蒸发器N6以及设置于制冰机G的作为蒸发器发挥功能的制冷剂通路G13，通过利用制冷剂配管将这些各设备连接来形成冷冻回路。

[0696] 压缩机N2的喷出侧的制冷剂配管在通过冷凝器N5和干燥器N8之后分支为两岔，成为制冷剂配管N9、N10。一方的制冷剂配管N9从与制冷剂配管N10的分支点起向下游侧依次设置有电磁阀N11、毛细管N12、蒸发器N6、合流部N13，最终与压缩机N2的吸引侧连接。另一方的制冷剂配管N10从与制冷剂配管N9的分支点起向下游侧依次设置有电磁阀N14、装卸机构部N3、膨胀阀N15、制冷剂通路G13、装卸机构部N4，在合流部N13处与制冷剂配管N9合流后与压缩机N2的吸引侧连接。

[0697] 冷却单元N在对冷却水槽N1进行冷却的情况下，打开制冷剂配管N9侧的电磁阀N11并关闭制冷剂配管N10侧的电磁阀N14后使压缩机N2工作。由此，由压缩机N2加压后的高温的制冷剂由冷凝器N5进行冷却而冷凝之后，通过干燥器N8后流入到制冷剂配管N9。流入到制冷剂配管N9的制冷剂由毛细管N12减压后在蒸发器N6中蒸发，来对贮存于冷却水槽N1的冷却水进行冷却。离开蒸发器N6的制冷剂通过合流部N13后返回到压缩机N2的吸引侧。此外，风扇N17与冷凝器N5接近配置。从设置于单元基部N18的吸入口经由空气过滤器N19导入的外部空气通过冷凝器N5从喷出口排出到外部。

[0698] 另一方面，冷却单元N在使制冰机G动作的情况下，打开制冷剂配管N10侧的电磁阀N14并关闭制冷剂配管N9侧的电磁阀N11后使压缩机N2工作。由此，由压缩机N2加压后的高温的制冷剂由冷凝器N5进行冷却而冷凝之后，通过干燥器N8后流入到制冷剂配管N10。流入到制冷剂配管N10的制冷剂通过装卸机构部N3，由膨胀阀N15减压后在制冷剂通路G13中蒸发，来在制冰机G内进行制冰。离开制冷剂通路G13的制冷剂通过装卸机构部N4和合流部N13后返回到压缩机N2的吸引侧。

[0699] 另外，作为重物的压缩机N2、冷凝器N5以落在单元基部N18上的方式配置于设备壳体2的下部，另一方面，利用自重来将冰供给到杯W的制冰机G配置于设备壳体2的上部。具体地说，如图179所示，冷却单元N的几乎全部设备配置于冷却水槽N1的下方，仅有制冷剂通路G13、膨胀阀N15与制冰机G一起配置于冷却水槽N1的上方。因此，在冷却单元N中，能够将装卸机构部N3、N4断开来将制冷剂通路G13、膨胀阀N15、制冰机G以及将它们连接的制冷剂配管从压缩机N2侧分离。由此，冷却单元N能够容易地将各设备设置于设备壳体2的上部和下部，制造效率提高。

[0700] 图180是示意性地表示配置于冷却水槽N1内的各设备的结构的俯视图。图181是示意性地表示配置于冷却水槽N1内的各设备的结构的纵截面图。

[0701] 冷却单元N通过使用蒸发器N6对贮存于冷却水槽N1内的冷却水进行冷却来生成冰块，对浸泡于冷却水槽N1内的水冷却盘管E41、多个糖浆冷却盘管N21、碳酸化器Q进行冷却。并且，在冷却水槽N1具备冷却水搅拌用的搅拌装置N22。水冷却盘管E41使从储液器E供给的饮用水在充满冷却水槽N1的冷却水中通过，由此对该饮用水进行冷却。糖浆冷却盘管N21使从盒中袋(BIB)供给的糖浆液在充满冷却水槽N1的冷却水中通过，由此对该糖浆液进行冷却。在图180中，例示了配置有3条糖浆冷却盘管N21以与3种糖浆液对应的结构。碳酸化器Q在浸泡于冷却水槽N1内的冷却水来被冷却的状态下，将碳酸气体高效地溶解于水来制造碳

酸水。

[0702] 在冷却水槽N1内，以沿着该冷却水槽N1的中部区域的内表面N1a将蒸发器N6弯折为U字形状并堆叠的方式进行蒸发器N6的配管，并且在该U字形状的蒸发器N6的内侧配置有呈螺旋状地卷绕几层的水冷却盘管E41。并且，在螺旋状的水冷却盘管E41的内侧，在水平方向上大致并排地配置有碳酸化器Q和搅拌装置N22。在搅拌装置N22的周围，以围绕其搅拌构件N22a的方式具备中空状的送水引导件N23。并且，在形成为U字形状的蒸发器N6的敞开侧，以与U字形状的蒸发器N6的敞开侧相向的方式具备沿横向卷绕成螺旋状的糖浆冷却盘管N21。此外，在弯折为U字形状来形成的蒸发器N6的内表面侧与卷绕成螺旋状的水冷却盘管E41的外周之间，设置有在蒸发器N6周围生成的冰块达不到其内侧的水冷却盘管E41的程度的间隔。同样地，在配置于蒸发器N6的敞开侧的糖浆冷却盘管N21与蒸发器N6的敞开侧端部之间，也设置有相同程度的间隔。

[0703] 另外，在蒸发器N6的周围，设置有对其周围生成的冰块进行探测的电极式的控制传感器N24。该控制传感器N24通过探测与设置于水中的不会生长冰的电极(未图示)之间的电阻，利用冰与水的电导率(电阻值)不同的性质(冰的电阻率比水的电阻率大)来控制在蒸发器N6的周围生成的冰块的冰厚(大小)。而且，将在蒸发器N6的周围生成的冰块作为蓄热源，通过搅拌装置N22的运转来搅拌充满冷却水槽N1内的冷却水来使其循环，对在水冷却盘管E41内通过的饮用水、在糖浆冷却盘管N21内通过的糖浆液以及由碳酸化器Q生成的碳酸水进行冷却。此外，图181中的参照标记N22b是搅拌装置N22的电动机。

[0704] <糖浆供给机构P>

[0705] 如图182所示，糖浆供给机构P具备糖浆泵P1～P3和糖浆供给线路P4～P6。糖浆供给机构P是将盒中袋(BIB)P7～P9内的糖浆供给到杯W的机构。

[0706] 盒中袋P7～P9贮存有糖浆原液。糖浆泵P1～P3是分别从盒中袋P7～P9吸出糖浆原液来喷出的泵。在本实施方式的情况下，糖浆泵P1、P2是齿轮式泵，糖浆泵P3是波纹管式泵。

[0707] 糖浆供给线路P4～P6是将分别由糖浆泵P1～P3喷出的糖浆原液供给至杯W的配管。在糖浆供给线路P4～P6的中途分别设置有浸泡配置于冷却水槽N1的糖浆冷却盘管N21。在糖浆供给线路P4、P5，在糖浆冷却盘管N21与杯W之间的位置分别设置有糖浆阀P10、P11。糖浆阀P10、P11例如是电磁式的开闭阀，对是否能够从糖浆供给线路P4、P5向杯W供给糖浆原液进行控制。

[0708] 因而，在这种糖浆供给机构P中，当在通常销售时发来销售信号时，糖浆泵P1～P3适当工作，盒中袋P7～P9内的糖浆原液被送出到糖浆供给线路P4～P6。接着，糖浆原液在糖浆冷却盘管N21中被冷却为规定温度之后，被供给到杯W。注入杯W内的糖浆原液根据需要被饮用水、来自碳酸化器Q的碳酸水稀释之后，被提供给使用者。此外，波纹管式的糖浆泵P3在送出糖浆原液之后，进行吸入动作来从盒中袋P9将糖浆原液吸入到内部。然后，当糖浆泵P3内充满糖浆原液时停止吸入动作，待机到下一个销售信号为止。

[0709] 如图183所示，齿轮式的糖浆泵P1、P2例如是以下结构：在泵主体P15内具有由电动机P12进行旋转驱动的一对齿轮P13、P14。一对齿轮P13、P14彼此啮合。而且，能够在彼此逆向旋转的齿轮P13、P14之间喷出糖浆原液，通过控制齿轮P13、P14的转速来控制糖浆原液的喷出量。

[0710] 如图184～图188所示，波纹管式的糖浆泵P3是利用波纹管P17来密封由连杆机构

驱动的活塞P16的构造。糖浆泵P3在内置有机构部的主体P18的一个侧面设置有兼作糖浆原液的贮存部的缸P19。在缸P19的前端设置有吸入口P20和喷出口P21。在吸入口P20连接有来自盒中袋P9的配管，在喷出口P21连接有糖浆供给线路P6。在吸入口P20安装有止回阀P20a，在喷出口P21安装有止回阀P21a。

[0711] 在缸P19的内部，隔着O形密封圈而嵌合有活塞P16。在活塞P16的下表面垂设有棒P23。两端具有凸缘部的波纹管P17以两端的凸缘部分别被夹住的方式安装在活塞P16的下表面与缸P19的下端部之间。波纹管P17是形成为逐渐扩展的圆筒形状的弹性膜，将缸P19的内部与主体P18侧的外部空气之间隔离。波纹管P17是用于防止尘埃等异物从主体P18侧进入缸P19内、并保证活塞P16的往复动作的密封构件。

[0712] 在主体P18的内部设置有齿轮电动机P26，在其输出轴安装有凸轮P27。第一连杆臂P29枢轴支承于驱动销P28，该驱动销P28枢轴支承于凸轮P27的靠外周的位置。第一连杆臂P29呈大致L字形状，L字的弯折部枢轴支承于从主体P18突出的轴销P30。在第一连杆臂P29的一端侧形成有长孔P29a，驱动销P28以能够沿长边方向进退的方式插入到该长孔P29a。第二连杆臂P31的一端部使用连结销P32来枢轴支承于第一连杆臂P29的另一端侧。棒P23的与活塞P16侧相反一侧的端部使用连结销P33来与第二连杆臂P31的另一端部连结。该第一连杆臂P29和第二连杆臂P31构成将齿轮电动机P26的旋转力变换为活塞P16的往复运动的连杆机构。该连杆机构构成为设置有沿着活塞P16的棒P23配设的第二连杆臂P31以及L字形状的第一连杆臂P29，由此能够将来自齿轮电动机P26的旋转力顺畅地变换为直线运动，能够笔直地推压活塞P16。

[0713] 在与凸轮P27相邻的位置设置有待机位置开关P35。待机位置开关P35借助凸轮P27来检测作为活塞P16的待机位置的后端位置。待机位置开关P35在凸轮P27侧的侧面具有检测部P35a。检测部P35a被开关抵接构件P36按压而接通，该开关抵接构件P36由凸轮P27按压来进退。开关抵接构件P36通过与凸轮P27的外周面以及形成于该外周面的一部分的凹部P27a接触来移动，将待机位置开关P35接通和断开。

[0714] 在齿轮电动机P26附设有电动机旋转传感器P38。糖浆泵P3是能够通过利用电动机旋转传感器P38探测齿轮电动机P26的转速来控制活塞P16的冲程的、能够设定为规定的定量的定量泵。

[0715] 因而，在这种糖浆泵P3中，当对齿轮电动机P26通电来使凸轮P27旋转时，驱动销P28在圆上移动。该驱动销P28的圆运动被第一连杆臂P29和第二连杆臂P31变换为直线运动后传递到棒P23。在图185所示的状态下，活塞P16处于返回到缸P19的后表面的待机位置，在缸P19内填充有糖浆原液。当从该状态起接收销售信号而齿轮电动机P26正向旋转与设定脉冲相当的量时，借助作为连杆机构的第一连杆臂P29和第二连杆臂P31，活塞P16前进，缸P19内的糖浆原液被喷出(参照图186)。在喷出所需量的糖浆原液之后，使齿轮电动机P26逆向旋转来使凸轮P27向反向旋转。由此，开关抵接构件P36从凸轮P27的外周面返回到凹部P27a，开关抵接构件P36对待机位置开关P35的检测部P35a的按压状态被解除。其结果，待机位置开关P35断开，齿轮电动机P26停止于该断开点(参照图187)。在此期间，糖浆原液再次被吸引到缸P19内。

[0716] 此外，待机位置开关P35能够通过调整其动作点(断开点)来调整活塞P16的冲程、也就是说糖浆原液的喷出量。例如松弛图185中的固定螺丝P39来调整待机位置开关P35(检

测部P35a)相对于凸轮P27的位置。由此，能够调整为：如图187所示，在活塞P16后退来进行糖浆原液的吸引时，活塞P16的位置在后退端(缸P19后表面)时待机位置开关P35断开。此外，待机位置开关P35例如是以下构造：通过被开关抵接构件P36按压的弹性片P35b来将检测部P35a接通和断开。因此，例如，待机位置开关P35的接通点可以调整成：在待机位置开关P35被开关抵接构件P36按压的期间，检测部P35a的突出长度P40例如为0.3mm～0.5mm。

[0717] <碳酸化器Q>

[0718] 如图189所示，碳酸化器Q是在浸泡配置于冷却水槽N1的密闭容器Q1的内部生成碳酸水的装置。碳酸化器Q使从碳酸气瓶Q2供给的碳酸气体混入从储液器E通过水冷却盘管E41供给的饮用水来生成碳酸水。所生成的碳酸水被供给到杯W。在密闭容器Q1的上表面设置有供水接头Q3、供气接头Q4以及碳酸水喷出接头Q5。

[0719] 如图189和图190所示，从浸泡于冷却水槽N1的水冷却盘管E41分支的分支配管经由电磁供水阀E44来与供水接头Q3连接。供水接头Q3与突出到密闭容器Q1内的水喷射喷嘴Q7连通。水喷射喷嘴Q7是从密闭容器Q1内的上部向下加压喷出饮用水的喷嘴。此外，从水冷却盘管E41分支的分支配管的一方与供水接头Q3连接，另一方是经由电磁冷水阀E42向杯W供给冷水的冷水供给线路。

[0720] 在供气接头Q4连接有来自碳酸气瓶Q2的气体配管Q9。供气接头Q4与突出到密闭容器Q1内的气体喷嘴连通。由此，贮存于碳酸气瓶Q2的碳酸气体经由气体配管Q9、供气接头Q4以及气体喷嘴被导入到密闭容器Q1内。

[0721] 在碳酸水喷出接头Q5连接有在密闭容器Q1内垂下的碳酸水导出管Q10以及向杯W供给碳酸水的碳酸水供给线路E43。碳酸水导出管Q10是用于将在密闭容器Q1内生成的碳酸水从底部侧提取到外部的配管。碳酸水导出管Q10从配置于密闭容器Q1内的下部的接收盘Q12之下将碳酸水吸上来。由此，即使例如正在从水喷射喷嘴Q7向密闭容器Q1内供给饮用水，也能够防止碳酸气体混入到碳酸水导出管Q10。在碳酸水供给线路E43设置有电磁碳酸水阀E45。

[0722] 因而，这种碳酸化器Q通过在从碳酸气瓶Q2通过供气接头Q4和气体喷嘴供给到密闭容器Q1内的碳酸气体的环境中喷出来自水喷射喷嘴Q7的饮用水来生成碳酸水。所生成的碳酸水被贮存在密闭容器Q1内，根据需要从碳酸水导出管Q10经由碳酸水供给线路E43供给到杯W。此外，在能够在贮存于密闭容器Q1内的碳酸水中漂浮的位置设置有浮子开关Q14。碳酸化器Q例如在由浮子开关Q14探测出的碳酸水的贮存量为规定量以下的情况下执行碳酸水的生成动作。

[0723] <排水机构A>

[0724] 如图191和图192所示，排水机构A具备排水容器A1、排水托盘A10、排水开关A2、排水盘A3以及电极开关A4。排水机构A用于贮存设备壳体2内从各机构溢出的饮用水、饮料、清洗水等排水。

[0725] 排水容器A1是贮存上述的排水的桶状的容器。贮存于排水容器A1内的排水在维护时等被废弃。排水托盘A10是在比排水容器A1靠上方的部位大致水平地配置于设备壳体2的内部的接收构件，周缘部朝向上方弯折。根据图也可以明确，排水托盘A10具有比排水容器A1大的面积，设置成覆盖原料供给机构D、储液器E、氯发生器B、温水箱F、制冰机G、杯输送机构H、搅拌机构J、研磨机K、冲泡机构L、冷却单元N、糖浆供给机构P、碳酸化器Q以及后述的取

出口机构S的下方。在该排水托盘A10设置有朝向排水容器A1的内部开口的排水通路A11。

[0726] 排水开关A2是探测排水容器A1内的水位的开关。排水开关A2是具有浮子A7的浮子开关，该浮子A7将支承于安装台A5的微动开关A6接通和断开。浮子A7借助绳索A8从板条状的检测片A6a的一端垂下，配置于排水容器A1内。

[0727] 在排水容器A1内的水位上升、且伴随该水位上升而浮子A7上升到规定水位的情况下，微动开关A6被接通。杯式自动售货机1的控制部R基于来自微动开关A6的接通信号来停止从自来水管口、供水箱E32的供水。

[0728] 如图191所示，排水盘A3例如配设于设备壳体2的底面板A9的下表面侧且设备壳体2的外部。排水盘A3是在例如由于对从自来水管口向储液器E的供水进行控制的电磁供水阀E3、E4产生不良状况等原因而从排水容器A1溢出排水的情况下接收该溢出的排水的容器。电极开关A4是探测排水盘A3中贮存有排水的传感器。在由电极开关A4探测出向排水盘A3漏水的情况下，杯式自动售货机1的控制部R例如切断向对从自来水管口向储液器E的供水进行控制的电磁供水阀E3、E4的通电。其结果，电磁供水阀E3、E4被强制性地关闭，从而强制停止水进一步流入储液器E。

[0729] 如图193所示，排水盘A3也可以配设于底面板A9的上表面侧且设备壳体2内。在该情况下，排水容器A1例如配置于排水盘A3内。

[0730] <取出口机构S>

[0731] 作为取出口机构S，存在自动门式的取出口机构S-1和手动门式的取出口机构S-2。首先，说明自动门式的取出口机构S-1。

[0732] <自动门式的取出口机构S-1>

[0733] 自动门式的取出口机构S-1是用于由使用者取出注入有饮料的杯W的部分，设置于前表面门3的正面大致中央。

[0734] 如图194、图195及图196所示，取出口机构S-1具有正面侧的取出口门S10、正面框体S12、向里侧突出的矩形的保持架S14、取出口门开闭电动机S16、阻尼器(damper)S18以及取出口门锁定螺线管S20。另外，取出口机构S-1具有取出口门关闭探测开关S22、一对取出口杯探测传感器S24a、S24b以及取出口照明S26。

[0735] 正面框体S12是用于对杯式自动售货机1的前表面门3进行安装的安装部，是取出口机构S-1的基部。取出口门S10是对正面框体S12进行开闭的半透明的门。取出口门S10构成为从正面看时左侧为铰链、右侧打开。在取出口门S10的从正面看时的右侧端部设置有卡合片S10a。在卡合片S10a设置有用于卡合的缺口。

[0736] 取出口门开闭电动机S16是DC齿轮电动机，设置于正面框体S12的背面侧的上部一端部，使取出口门S10开闭。阻尼器S18是将取出口门开闭电动机S16的旋转传递到取出口门S10的部分，并且，在施加过重的力时作为限制器起作用，还作为致动器的动作凸轮起作用。

[0737] 保持架S14是从杯输送机构H将杯W输送过来的受理场所，从正面框体S12向后侧突出，背面侧开口，正面侧由取出口门S10来开闭。在保持架S14的内部左右的里侧设置有一对加强肋S28，突出片S30从各个加强肋S28的下端附近向后方突出。

[0738] 左右一对加强肋S28为上方部彼此相离、且随着去向下方部而缩窄的形状。通过该形状，保持架S14适应于杯W的形状地上方开口大、下方开口小。

[0739] 如图197所示，能够沿XY方向移动的杯输送机构H的引导片H183插入在一对突出片

S30之间，X方向的位置被固定。因而，即使使用者沿X方向对杯W和杯输送机构H施加力，通过与突出片S30抵接，杯W和杯输送机构H的位移也会被限制，从而稳定地载置杯W。此外，如后所述，杯输送机构H在Y方向上也被固定。

[0740] 取出口杯探测传感器S24a、S24b相向地设置在保持架S14的左右两壁。取出口杯探测传感器S24a是用于探测杯W已被输送到保持架S14内的光传感器中的发光元件，取出口杯探测传感器S24b是与发光元件对应的受光元件。取出口杯探测传感器S24a、S24b的高度被设定在杯输送机构H的台H181与杯挡板H182L、H182R之间，点划线所示的光轴不会被杯W以外之物所遮挡。加强肋S28也设置于避开该光轴的位置。因而，取出口杯探测传感器S24a、S24b能够不受台H181和杯挡板H182L、H182R影响地仅探测杯W。

[0741] 保持架S14的底面S14a以从正面侧到背面侧地下降的方式平缓地倾斜，即使饮料溢出到保持架S14内也能够向内侧(图195的面前侧)流而排出到托盘，不会污染前表面门3、地板面。

[0742] 在取出口机构S-1和杯输送机构H的下方设置有托盘。托盘用于接住溢出的饮料、原料，所接住的饮料、原料通过排水软管流入到搭载于设备壳体2的内部下方右侧的排水容器。

[0743] 返回到图194～图196，取出口门锁定螺线管S20是在待机时和杯W的提供准备过程中将取出口门S10锁定为关闭状态的螺线管，将卡合片S10a卡合/释放。当杯W在保持架S14内的提供准备完成时，取出口门锁定螺线管S20将卡合片S10a从卡合状态释放，使取出口门S10能够开放。通过利用取出口门锁定螺线管S20将取出口门S10锁定为关闭状态，能够防止使用者在杯W的提供准备完成之前不经意地将手伸入到取出口机构S-1内。

[0744] 取出口门关闭探测开关S22是探测取出口门S10是否处于关闭状态的开关。

[0745] 取出口照明S26是对输送到保持架S14内的杯W进行照射的LED照明，设置于保持架S14的上表面。利用取出口照明S26，能够使使用者取出杯W时的手边变得明亮，并且能够呈现高级感。取出口照明S26的照明开始时刻例如可以设为杯W被运入到保持架S14内的时间点。取出口照明S26的照明结束时刻例如可以设为由取出口杯探测传感器S24a、S24b确认出杯W的取出的时间点、或者在此后由取出口门关闭探测开关S22确定出取出口门S10已关闭的时间点。

[0746] 取出口机构S-1如以下那样起作用。即，当由取出口杯探测传感器S24a、S24b确认出装有饮料的杯W的运入时，在取出口门锁定螺线管S20的作用下，取出口门S10的关闭锁定被解除。然后，通过取出口门开闭电动机S16的正转来打开取出口门S10。由取出口门关闭探测开关S22探测出取出口门S10已打开。由取出口杯探测传感器S24a、S24b探测出使用者取出了杯W，在从此起经过规定时间之后，通过取出口门开闭电动机S16的反转来关闭取出口门S10。由取出口门关闭探测开关S22探测出取出口门S10已关闭。之后，在取出口门锁定螺线管S20的作用下，将取出口门S10关闭锁定。

[0747] 另一方面，在规定时间内杯W未从取出口被取出的情况下，也由取出口杯探测传感器S24a、S24b探测出该情况，通过取出口门开闭电动机S16来闭塞取出口门S10，通过取出口门锁定螺线管S20进行锁定。

[0748] 在该情况下，对于配置于取出口机构S-1的杯W，通过驱动杯输送机构H-1的XY台H10，能够使杯把持装置H12从取出口机构S-1移动到烹调位置。然后，在搅拌桨J10下降来插

入到杯W之后，驱动XY台H10，由此杯把持装置H12移动到比烹调位置更靠深处的位置，由此装有饮料的杯W从台H181落下到下方。这样，装有饮料的杯W落下到排水托盘A10，所装的饮料流入排水容器A1。因而，只要之后使搅拌桨J10上升，使杯把持装置H12经由烹调位置移动到待机位置，就能够准备下一次饮料销售。

[0749] <手动门式的取出口机构S-2>

[0750] 图198所示的取出口机构S-2除了省略了取出口门开闭电动机S16以外，基本结构与取出口机构S-1相同。在取出口机构S-2中取出口门S10为手动式。

[0751] 取出口机构S-2如以下那样起作用。即，当由取出口杯探测传感器S24a、S24b确认出装有饮料的杯W的运入时，在取出口门锁定螺线管S20的作用下，取出口门S10的关闭锁定被解除。然后，由使用者打开取出口门S10。由取出口门关闭探测开关S22探测出取出口门S10已打开。由取出口杯探测传感器S24a、S24b探测出杯W被使用者取出，此后，通过使用者松开手，取出口门S10自动关闭。利用未图示的弹簧来进行取出口门S10的自动的关闭动作。由取出口门关闭探测开关S22探测出取出口门S10已关闭。之后，在取出口门锁定螺线管S20的作用下，将取出口门S10关闭锁定。

[0752] 在规定时间内杯W未从取出口被取出的情况下的处理与自动门式的取出口机构的处理相同。

[0753] <控制功能>

[0754] <位置校正功能>

[0755] 接着，说明杯式自动售货机1中的控制部R的几个控制功能。首先，说明位置校正功能。

[0756] 在杯式自动售货机1中，需要杯输送机构H(参照图76)对杯把持装置H12和杯W的定位精度，对此设置有位置校正功能。在出厂时、对设备进行分解组装的情况下以及在由于某种原因而产生了误差的情况下进行位置校正功能的定位调整，使得能够在控制部R的控制下个别地进行以下的各位置的校正。

[0757] 即，从原料供给机构D接受原料的供给的位置；利用搅拌机构J对装有咖啡、热水、粉末原料等的杯W进行搅拌的烹调位置；将不需要的杯W废弃的杯废弃位置；在取出口机构S提供装有饮料的杯W的位置；销售待机位置等。具体地说，在位置校正模式下，利用杯输送机构H使杯把持装置H12移动到各位置，由服务人员分别测量与目标位置之间的X方向误差和Y方向误差，以mm为单位向控制部R进行数值输入/登记。

[0758] 此后，控制部R将所输入的数值识别为校正量，在实际的销售准备时的各动作中使杯把持装置H12移动到校正后的位置，来抵消误差。由此，基本上服务人员仅通过误差测量和按键输入的简便操作就能够在短时间内进行调整。

[0759] 另外，能够将服务人员所输入的校正量存储到与控制部R连接的USB存储器，能够加载到其它杯式自动售货机1或在个人计算机上进行确认。

[0760] <卫生功能>

[0761] 接着，说明卫生功能。杯式自动售货机1具备几个卫生功能以清洗饮用水所通过的流路来保持清洁。根据卫生功能的种类，存在在控制部R的控制下完全自动地进行的卫生功能以及基于控制部R的指示来由服务人员进行一部分作业的卫生功能。卫生功能例如包括被称为热系卫生、冷系卫生以及自动冲洗的卫生功能。

[0762] 在热系卫生中，对热水流过的流路进行清洗。具体地说，在热系卫生模式下，控制部R向冲泡机构L(参照图102)的缸L23流通热水来进行预备清洗。接着，按照控制部R的引导，服务人员从冲泡机构L的原料投入口L37a投入规定量的药剂(例如漂白剂)，之后，在控制部R的控制下流通热水来对缸L23的内表面进行药剂清洗。并且，使热水流通几次来进行漂洗后结束热系卫生。

[0763] 在冷系卫生中，对饮用水流过的流路进行清洗。具体地说，在冷系卫生模式下，按照控制部R的引导，服务人员从储液器E投入规定量的药剂(例如漂白剂)。之后，在控制部R的控制下，使投入有药剂的水在饮用水流动的流路中循环来进行清洗。然后，在排出投入有药剂的水之后，利用未投入药剂的水漂洗几次后结束冷系卫生。

[0764] 自动冲洗是在控制部R的控制下完全自动地定期进行的，对冲泡机构L的缸L23、搅拌碗M的搅拌容器M11流通热水来进行清洗。自动冲洗的执行定时能够任意地设定，例如1天1次、1周1次或者每隔设定销售次数地进行，在使用者少的夜间进行。

[0765] 也能够不依靠控制部R的作用而由服务人员通过完全手动式来进行流路的卫生。

[0766] <使用者支持功能>

[0767] 接着，说明使用者支持功能。在杯式自动售货机1中，具备用于向使用者提供更好的服务的几个使用者支持功能。

[0768] 其中，原料增减功能是根据使用者的嗜好来增减咖啡原料、砂糖、奶油等的功能，能够利用设置于前表面门3的表面的增开关、减开关来指定。也可以是能够将各增减指定为多级。

[0769] 无冰功能是根据使用者的嗜好来不向冷饮料投入冰的功能，能够利用设置于前表面门3的表面的无冰开关来指定。

[0770] 无杯盖功能是在带有对杯W附加杯盖的功能的机种中根据使用者的判断来省略杯盖的功能，能够利用设置于前表面门3的表面的无杯盖开关来指定。

[0771] 个人用杯(my cup)功能是取代作为标准的纸制的杯W而向使用者自带的个人用杯提供饮料的功能，能够利用设置于前表面门3的表面的个人用杯开关来指定。当指定了个人用杯功能时，首先取出口机构S(参照图194)的取出口门S10被解锁，使用者能够打开取出口门S10来载置个人用杯。当由传感器探测出载置了个人用杯时，控制部R将取出口门S10锁定为关闭状态。然后，对个人用杯进行此后的饮料注入/搅拌工序，将注入有饮料的个人用杯运入到取出口机构S。在尽管按下了个人用杯开关但是在规定时间内未探测出个人用杯的情况下，停止个人用杯功能而如通常那样向纸制的杯W注入饮料来进行提供。

[0772] <成果呈现功能>

[0773] 一般来说，与销售罐饮料的自动售货机不同，在杯式自动售货机1中，到提供饮料为止需要一些时间。而且，该时间根据杯式自动售货机1的机种、饮料的种类和量而不同，因此使用者不知道需要等待的时间。另外，在提供饮料的准备完成时，需要向使用者进行通知。因此，在杯式自动售货机1中，具备向使用者通知需要等待的时间的几个功能以及通知提供饮料的准备已完成的几个功能。

[0774] 倒计时功能是在设置于前表面门3的数值显示器中以秒为单位来显示到提供饮料为止的时间的功能。数值显示器也可以兼作在销售待机时显示温水箱F的温度的温度显示器等。通过倒计时功能，使用者能够直接识别需要等待的时间。

[0775] 多指示器点亮功能是使排列于前表面门3的多个(例如5个左右)LED等指示器适当点亮、例如通过点亮的指示器的数量来显示饮料准备工序的大体的推测的功能。具体地说，最初是一端的指示器闪烁，接着一端的指示器从闪烁切换为点亮，并且第二个指示器闪烁。像这样指示器依次逐渐闪烁/点亮，最后在另一端的指示器从闪烁切换为点亮的时间点饮料准备工序完成。在多指示器点亮功能中，也可以是，随着饮料准备工序的进行，指示器点亮数从全亮状态依次减少。通过多指示器点亮功能，使用者能够识别需要等待的时间的大体的推测。

[0776] 提取工序指示器功能是使排列于前表面门3的多个(例如5个左右)LED等指示器适当点亮来显示该时间点的饮料准备工序阶段的功能。提取工序指示器功能例如应用于销售咖啡时，准备与提取原料的放出工序、研磨工序、提取工序、搅拌工序、输送工序等饮料准备工序对应的指示器。在销售咖啡时，使与当前时间点的工序阶段对应的指示器点亮或闪烁。或者，也可以如上述的多指示器点亮功能那样，根据工序阶段来使指示器的点亮数增减。通过提取工序指示器功能，使用者能够具体地识别饮料准备工序的进行状况。

[0777] 取出口照明功能是在装有饮料的杯W被运入到取出口机构S(参照图196)来完成了提供饮料的准备时通过取出口照明S26来对杯W进行照明的功能。通过取出口照明功能，使用者能够识别出提供饮料的准备已完成，并且取出口机构S内变得明亮从而易于取出杯W。另外，取出口照明功能还能够呈现出杯式自动售货机1的高级感。

[0778] 自动门功能是在装有饮料的杯W被运入到取出口机构S(参照图196)来完成了提供饮料的准备时自动打开取出口门S10的功能。当探测出杯W已被取出时，取出口门S10自动关闭。通过自动门功能，使用者能够识别出提供饮料的准备已完成，并且不需要进行取出口门S10的开闭操作，单手也能够取出杯W。另外，该自动门功能能够呈现出杯式自动售货机1的高级感。

[0779] 灯闪烁功能是装有饮料的杯W被运入到取出口机构S(参照图196)来完成了提供饮料的准备时使设置于前表面门3的灯(包括按钮内灯)的全部或一部分闪烁的功能。当使设置于前表面门3的很多灯闪烁时很显眼，因此使用者易于识别出提供饮料的准备已完成。

[0780] 也可以还通过蜂鸣器、声音等来向使用者通知提供饮料的准备已完成。

[0781] <布局>

[0782] 分别说明杯式自动售货机1中的4个机种中的设备壳体2的内部布局。

[0783] <中型的杯式自动售货机1-1>

[0784] 首先，参照图199和图200来说明中型的杯式自动售货机1-1。中型的杯式自动售货机1-1应用于销售杯数多的情况，要贮存于设备壳体2的内部的饮料原料的量和杯的收容数多。

[0785] 如图199所示，在中型的杯式自动售货机1-1中，在设备壳体2的内部，在顶面左端设置有库内灯T100，在其里侧沿着左壁设置有制冰机G。在制冰机G的右侧设置有储液器E，在储液器E安装有与温水箱F相连的水泵E1。在制冰机G的下侧，在左壁的中间设置有饮用水用的水泵E1。在制冰机G的面前侧设置有存储咖啡豆的提取原料供给机构D-2(参照图200)、研磨机K以及冲泡机构L。

[0786] 在地板面左端设置有冷却单元N，在其上侧且水泵E1的下侧设置有冷却水槽N1。冷却单元N和冷却水槽N1设置于制冰机G的下方，适于利用配管将两者连接。在冷却单元N的下

方的右侧面设置有水坝开关T106。在由于某种原因而液体积存于设备壳体2的地板面的情况下，通过水坝开关T106探测出该情况，控制部R采取系统停止等需要的措施。

[0787] 在设备壳体2的内部，在地板面配置存储有糖浆原液的多个盒中袋P7～P9，并且根据需要而配置有1个以上的筒式的供水箱E32。盒中袋P7～P9中存储的糖浆原液被相同数量的糖浆泵P1～P3吸出，另一方面，供水箱E32的饮用水被辅助泵E30吸出，分别供给到储液器E、制冰机G以及烹调位置等。

[0788] 在设备壳体2的内部，在上部的大致右半部分设置有粉末原料供给机构D-1。粉末原料供给机构D-1具有沿横向宽度方向并排排列的多个(在图199中为8个)罐D10以及安装于各罐D10之下的滑槽D20。在粉末原料供给机构D-1的左侧面的下半部分设置有搅拌机构J。同样地在左侧面的上端部设置有清洗用具F60。保持清洗用具F60的卡定部设置于使前端的喷嘴F61位于比温水箱F内的热水水面高的位置的位置。在粉末原料供给机构D-1的左侧的下端部设置有排气风扇T110。

[0789] 如图200所示，在粉末原料供给机构D-1的里侧配置有温水箱F。在粉末原料供给机构D-1的面前侧设置有两种圆形杯供给机构C-2。

[0790] 中型的杯式自动售货机1-1在正面左侧设置有用于开闭前表面门3的铰链T116。在设备壳体2的内部，制冰机G配置于左端的最里侧，在其面前侧设置有提取原料供给机构D-2。提取原料供给机构D-2的前表面接近前表面门3，如果打开前表面门3则易于进行维护。在提取原料供给机构D-2的左侧，在设备壳体2的左壁设置有电源盒T118。

[0791] 制冰机G在俯视时呈大致圆形，其直径比较大，但是比排列于右侧的主要设备的横向宽度小。提取原料供给机构D-2的横向宽度比较小，深度方向宽度比较大。若将深度方向宽度比较大的制冰机G和提取原料供给机构D-2沿深度方向排列，则设备壳体2的内部的深度方向宽度大致被填满。另外，提取原料供给机构D-2的横向宽度比较小，因此能够在左侧配置电源盒T118。这样，在设备壳体2的内部的左侧部分，将深度方向宽度比较大的制冰机G和提取原料供给机构D-2集中排列，成为没有浪费的布局。并且，与几乎免维护的制冰机G相比，提取原料供给机构D-2需要原料补给、部件补给以及维护，通过设置于前表面侧而易于操作。

[0792] 在设备壳体2的内部的从中央部到右侧部分，从里侧依次设置有温水箱F、粉末原料供给机构D-1以及两种圆形杯供给机构C-2。

[0793] 两种圆形杯供给机构C-2能够利用设置于设备壳体2的右壁的铰链T120来打开到面前侧，从而能够使里侧的粉末原料供给机构D-1暴露。前表面门3向左侧打开，另一方面，两种圆形杯供给机构C-2向右侧打开，由此能够使各自的开度大，能够容易地进行对粉末原料供给机构D-1的维护。

[0794] 温水箱F的深度方向宽度小，但是横向宽度比制冰机G的横向宽度大。两种圆形杯供给机构C-2的深度方向宽度和横向宽度均比温水箱F大。粉末原料供给机构D-1的深度方向宽度与两种圆形杯供给机构C-2为相同程度，但是横向宽度为中型的杯式自动售货机1-1的一半左右，比较大。

[0795] 在设备壳体2的内部的从中央部到右侧部分，横向宽度大的温水箱F、粉末原料供给机构D-1以及两种圆形杯供给机构C-2被集中排列，不存在空间的浪费。特别是，温水箱F的深度方向宽度小，因此能够进一步将粉末原料供给机构D-1和两种圆形杯供给机构C-2配

置为同列。两种圆形杯供给机构C-2位于接近前表面门3的位置，易于进行杯W的补给等操作。通过利用铰链T120打开两种圆形杯供给机构C-2，粉末原料供给机构D-1被暴露，易于进行原料补给等操作。温水箱F大致免维护，而且温度比较高，因此配置于最里侧以避免不经意地接触。温水箱F配置于上方，因此能够得到高的水头压力，易于向机内各部供给热水。

[0796] 这样，根据中型的杯式自动售货机1-1，比较需要设置空间的制冰机G与两种圆形杯供给机构C-2及粉末原料供给机构D-1在设备壳体2的内部配置于左右，因此能够实现前后的尺寸的小型化，从而能够防止装置的大型化。

[0797] <小型的杯式自动售货机1-2>

[0798] 图201示出了小型的杯式自动售货机1-2中设备壳体2的内部俯视图。小型的杯式自动售货机1-2比中型的杯式自动售货机1-1小，应用于销售杯数为中等程度的情况，贮存于设备壳体2的内部的饮料原料的量大，杯的收容数稍少。

[0799] 在中型的杯式自动售货机1-1中，粉末原料供给机构D-1的罐D10为并排8个，与此相对，在小型的杯式自动售货机1-2中，粉末原料供给机构D-1的罐D10为并排6个。另外，在中型的杯式自动售货机1-1中，使用两种圆形杯供给机构C-2，与此相对，在小型的杯式自动售货机1-2中，使用单种圆形杯供给机构C-1，小型的杯式自动售货机1-2的整个宽度也变小了与这些机构的横向宽度相应的量。小型的杯式自动售货机1-2除了粉末原料供给机构D-1和单种圆形杯供给机构C-1以外，与杯式自动售货机1-1相同，省略正视图及其详细的说明。小型的杯式自动售货机1-2具有与中型的杯式自动售货机1-1同样的布局上的效果。

[0800] <紧凑型的杯式自动售货机1-3>

[0801] 图202和图203示出了紧凑型的杯式自动售货机1-3。紧凑型的杯式自动售货机1-3比小型的杯式自动售货机1-2小，应用于销售杯数为中等程度的情况，贮存于内部的饮料原料的量大，杯的收容数稍少。

[0802] 在中型的杯式自动售货机1-1中，粉末原料供给机构D-1的罐D10为并排8个，与此相对，在紧凑型的杯式自动售货机1-3中粉末原料供给机构D-1的罐D10为并排7个。

[0803] 另外，在中型的杯式自动售货机1-1中，提取原料供给机构D-2的罐D10为并排2个，与此相对，在紧凑型的杯式自动售货机1-3中，提取原料供给机构D-2为并排3个，横向宽度稍大。在中型的杯式自动售货机1-1中，电源盒T118设置于左壁，与此相对，在紧凑型的杯式自动售货机1-3中，与提取原料供给机构D-2的横向宽度稍大相应地，电源盒T118设置于设备壳体2内的背面的稍下方。在中型的杯式自动售货机1-1中，使用两种圆形杯供给机构C-2，与此相对，在紧凑型的杯式自动售货机1-3中，使用单种方形杯供给机构C-4。另外，在紧凑型的杯式自动售货机1-3中，使用小型的温水箱F，省略了盒中袋P7～P9。在紧凑型的杯式自动售货机1-3中，也具有与中型的杯式自动售货机1-1同样的布局上的效果。

[0804] <超小型的杯式自动售货机1-4>

[0805] 图204和图205示出了超小型的杯式自动售货机1-4。超小型的杯式自动售货机1-4比紧凑型的杯式自动售货机1-3小，应用于办公室所需等节省空间且多菜单用途，贮存于内部的饮料原料的量和杯的收容数稍少。

[0806] 在超小型的杯式自动售货机1-4中，前表面门3为利用设置于右侧的铰链T116来开闭的左开式。

[0807] 在超小型的杯式自动售货机1-4中，在内部，在左侧的上端设置有温水箱F，在其前

方并排配置有单种方形杯供给机构C-4和提取原料供给机构D-2。单种方形杯供给机构C-4配置成以长边方向为深度方向，有效利用了空间。

[0808] 在单种方形杯供给机构C-4之下设置有排气风扇T110，再之下设置有研磨机K和冲泡机构L。

[0809] 在超小型的杯式自动售货机1-4的内部，在右侧的上端设置有制冰机G，在其前方的右壁设置有电源盒T118。

[0810] 在超小型的杯式自动售货机1-4的内部，在中层的前方设置有粉末原料供给机构D-1。粉末原料供给机构D-1与提取原料供给机构D-2在俯视时有一部分重叠，但是前者设置于上方，后者设置于中层，由此不会发生干扰。研磨机K和冲泡机构L设置于比提取原料供给机构D-2稍向下偏离的位置且左壁的附近，确保了粉末原料供给机构D-1的配置空间。在冲泡机构L之下设置有盛渣容器T119，在再之下设置有载置于地板面的DC电源继电器盒T122。

[0811] 在超小型的杯式自动售货机1-4的内部，在稍下方部，在右侧设置有冷却单元N，在中央设置有氯发生器控制盒B10。在氯发生器控制盒B10的左侧设置有盛渣容器T119。

[0812] 在冷却单元N之下设置有冷却单元过滤器T126、排水容器开关T128、滤水器T130。在再之下的地板面附近设置有水坝开关T106。

[0813] 超小型的杯式自动售货机1-4虽然与中型的杯式自动售货机1-1左右相反，但是具有与中型的杯式自动售货机1-1大致同样的布局上的效果。另外，通过在布局上下工夫来实现了超小型尺寸。

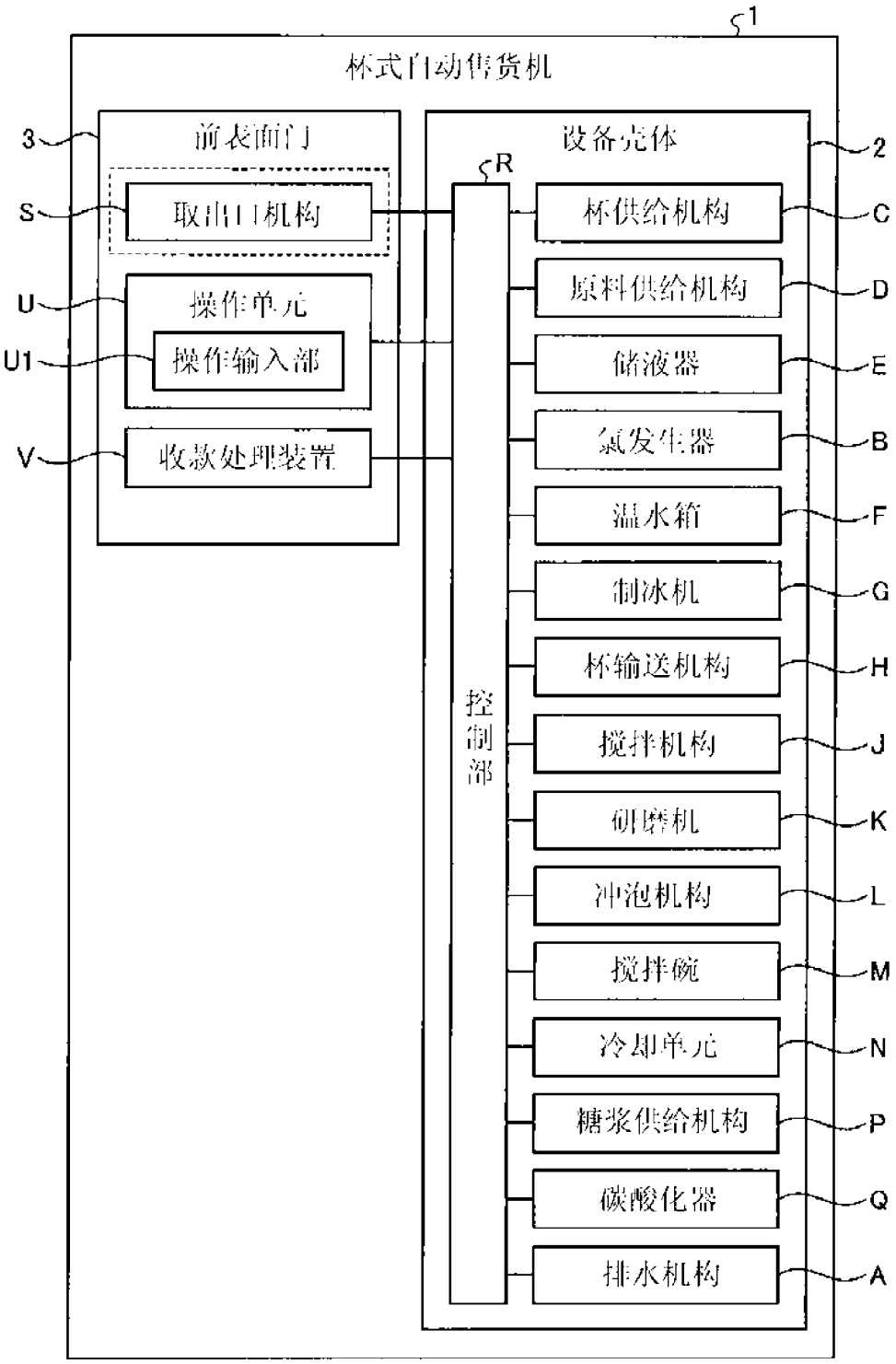


图1

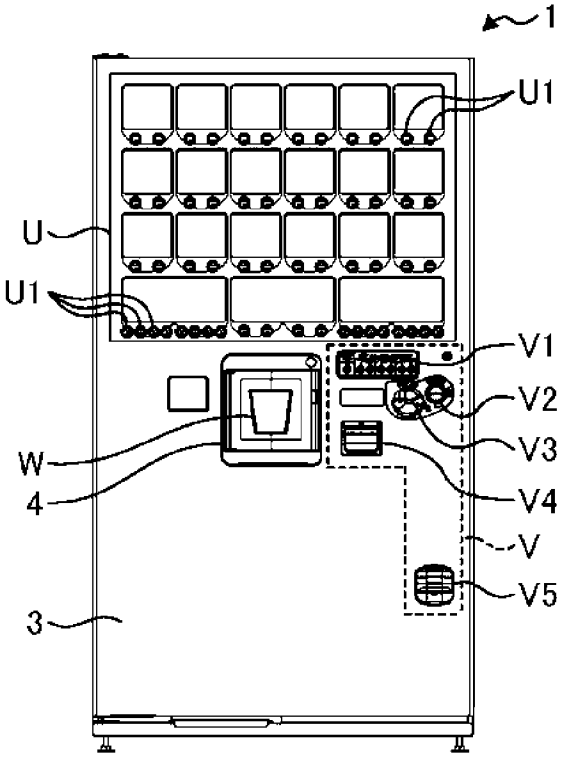


图2

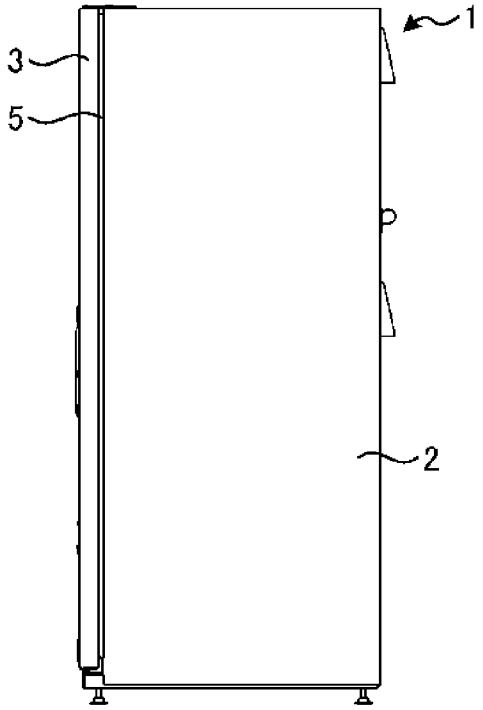


图3

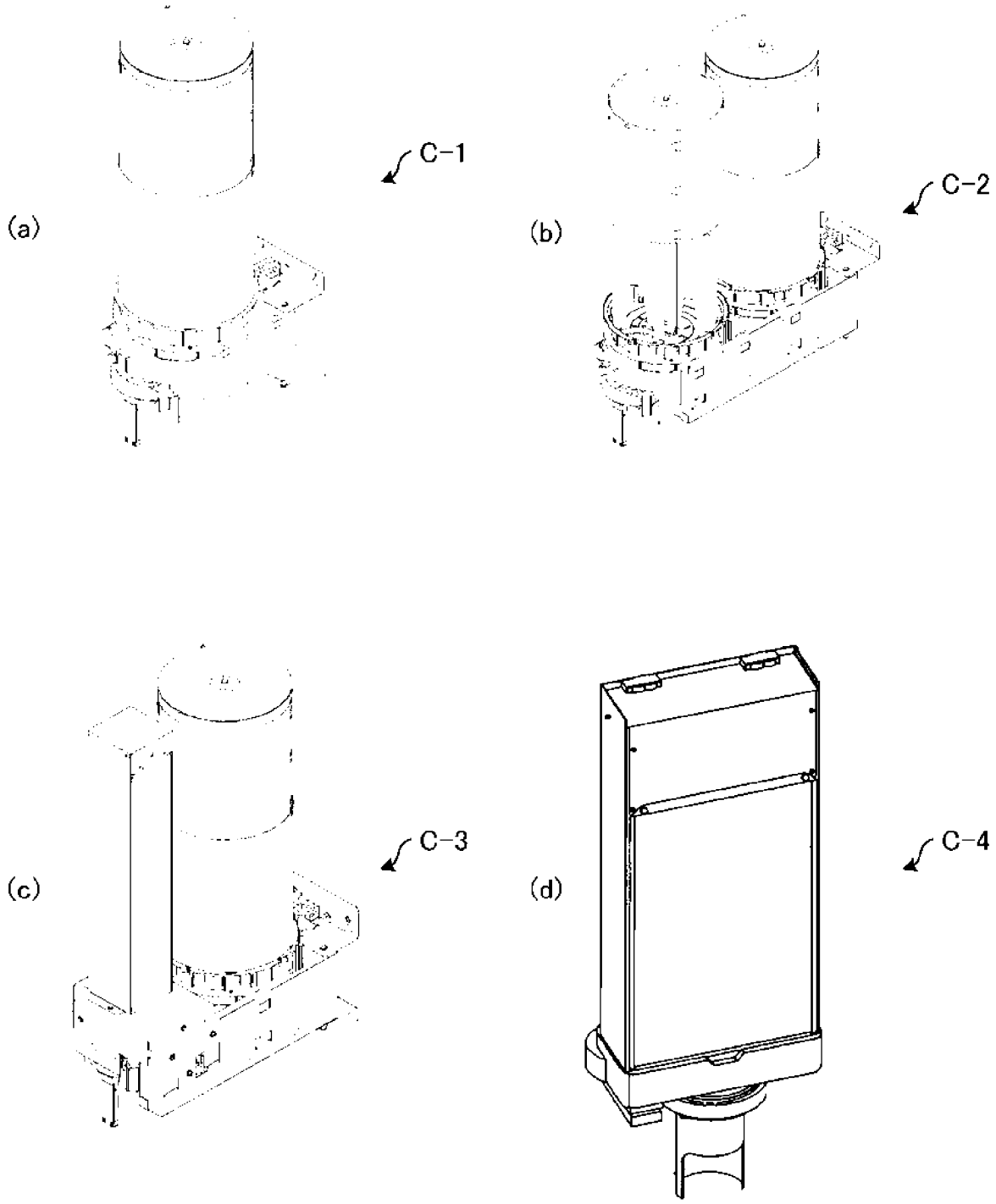


图4

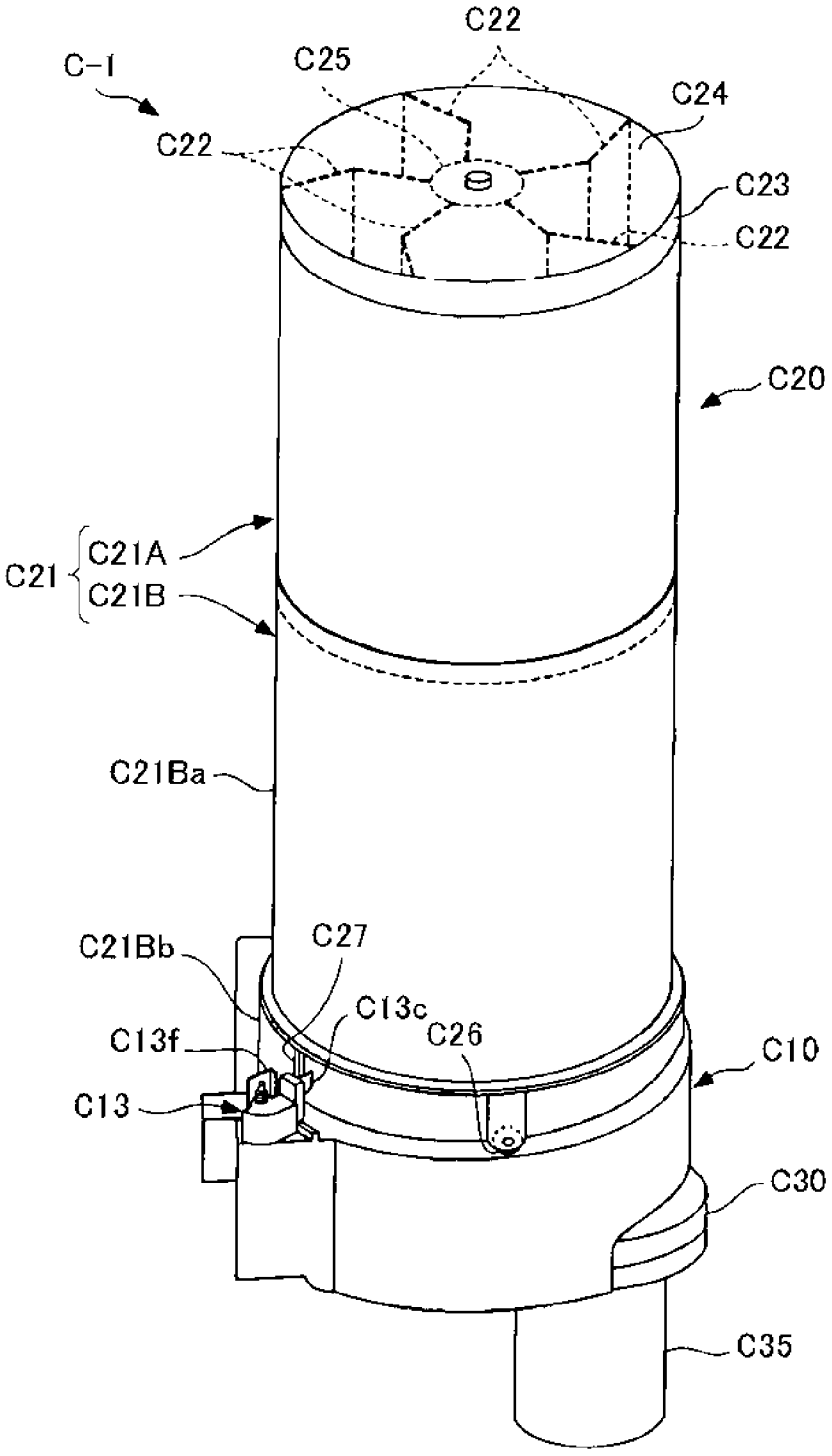


图5

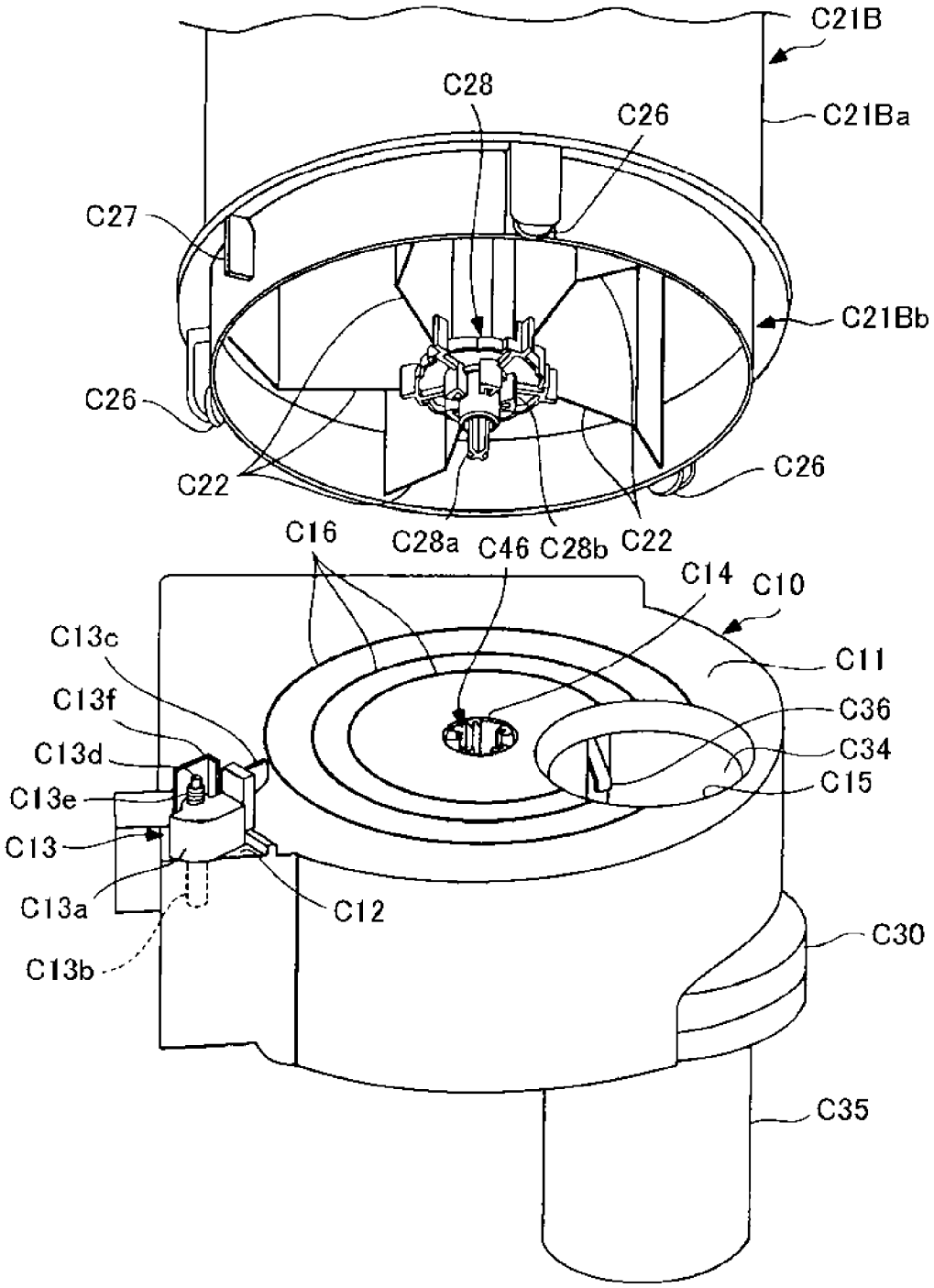


图6

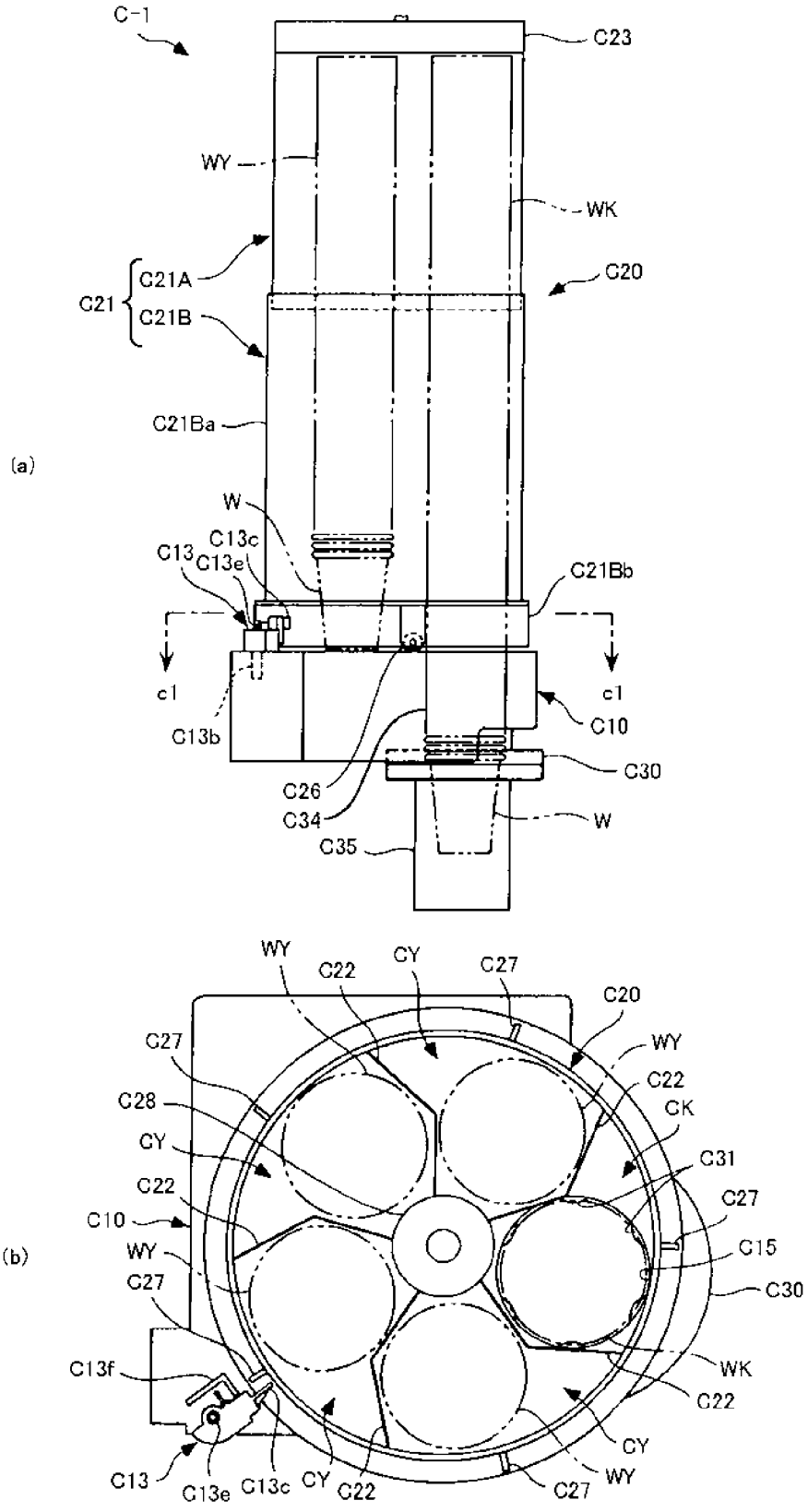


图7

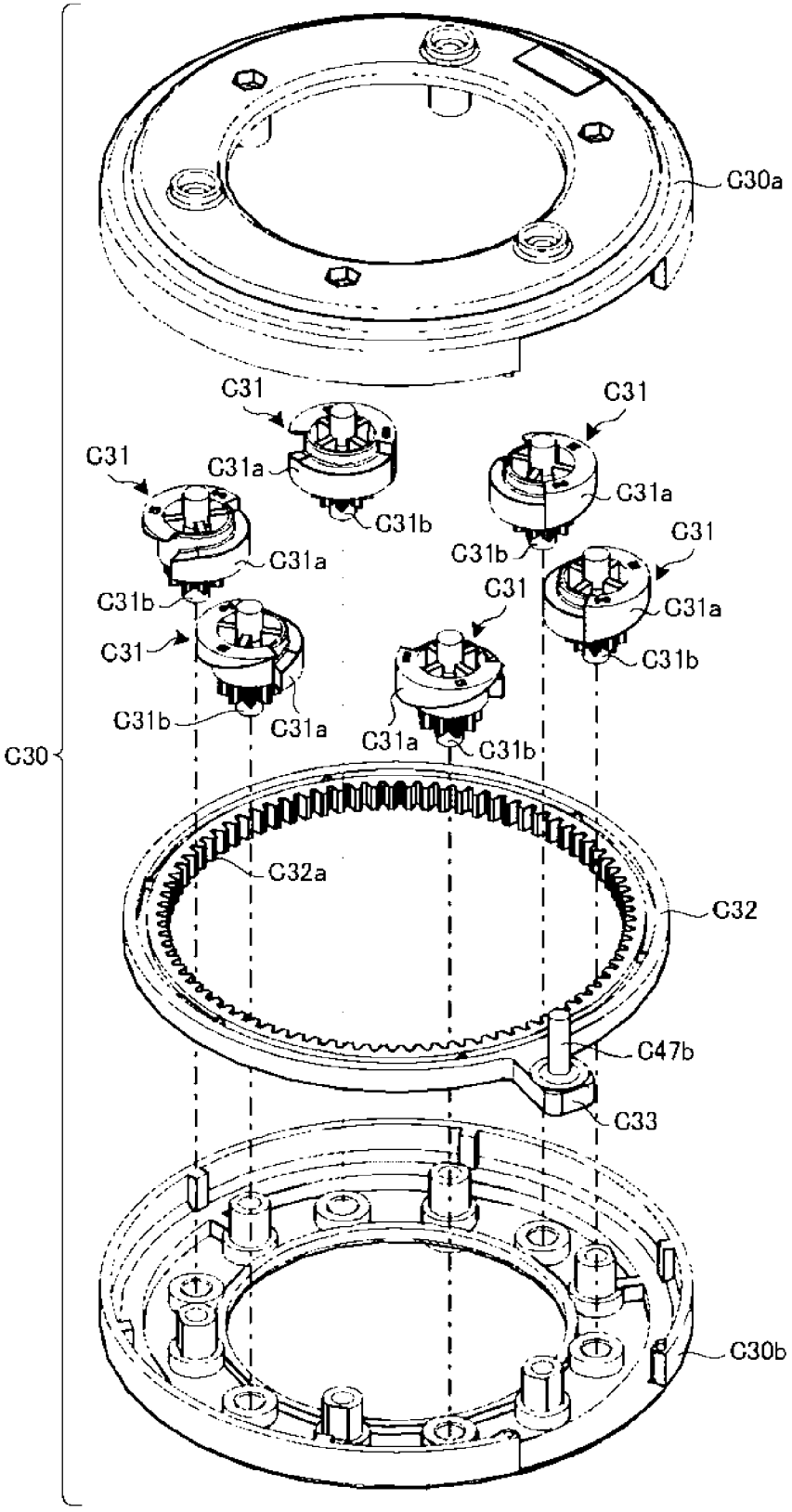


图8

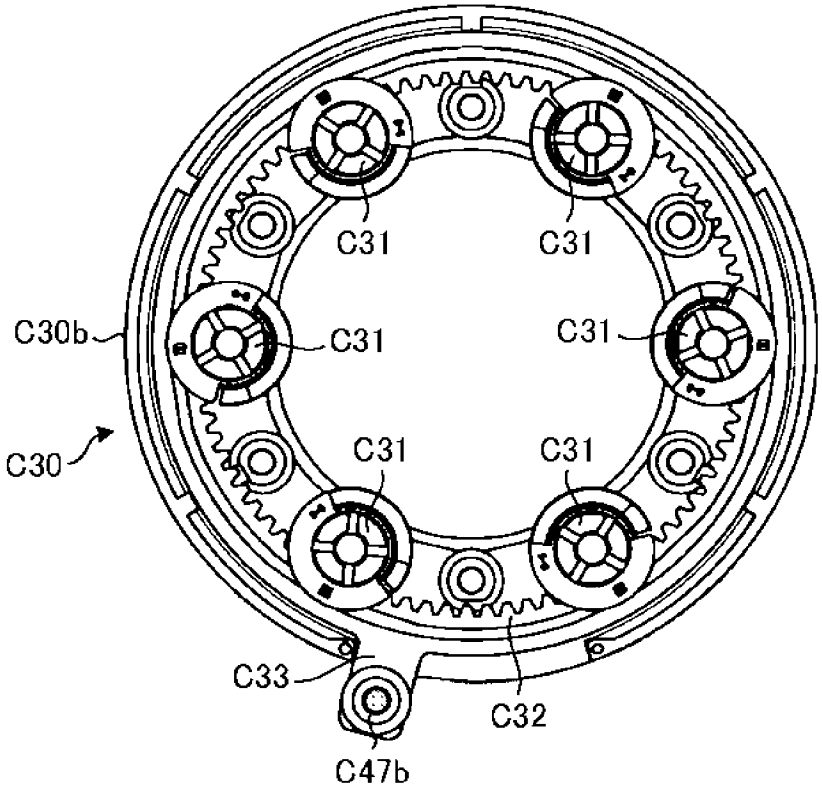


图9

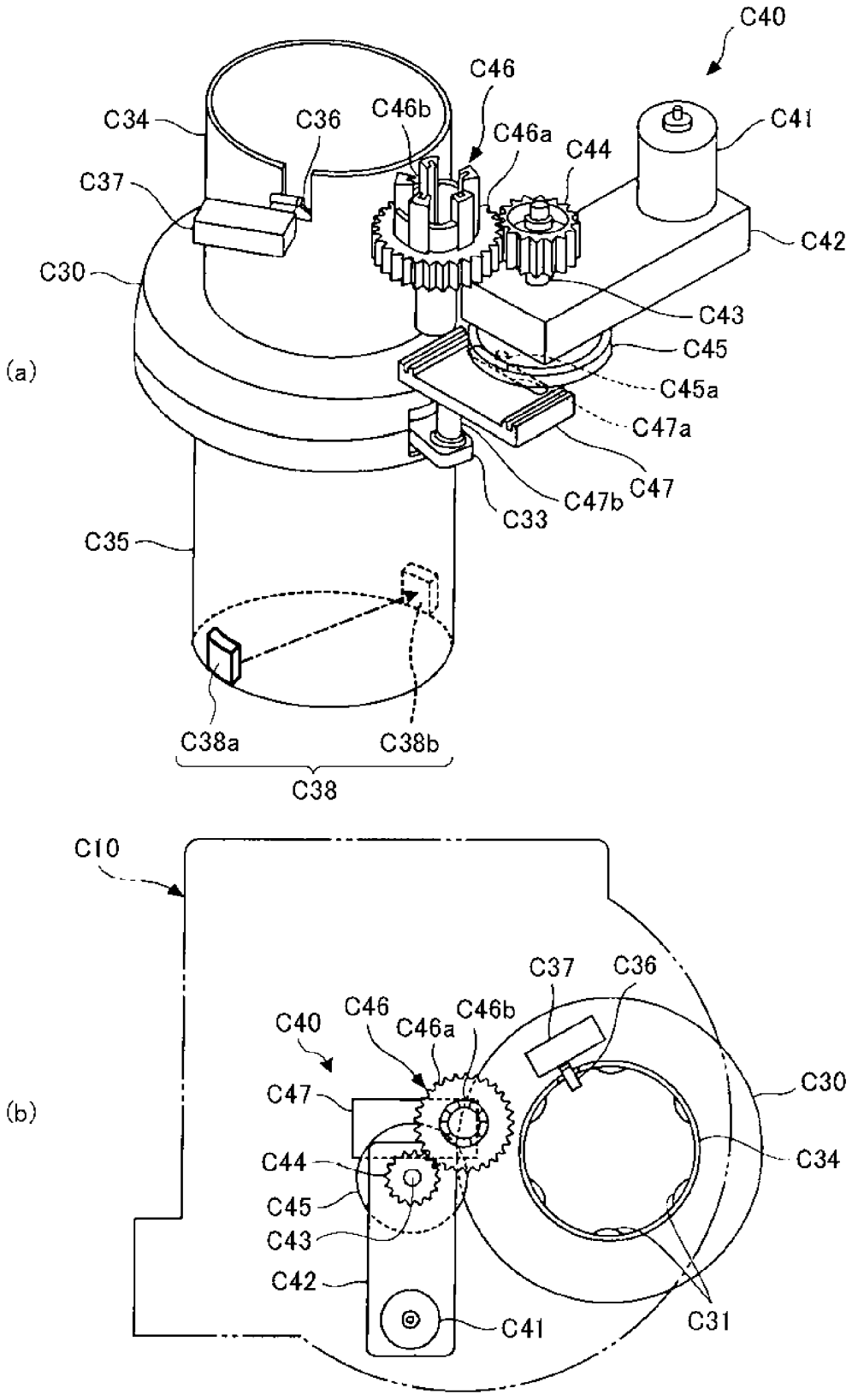


图10

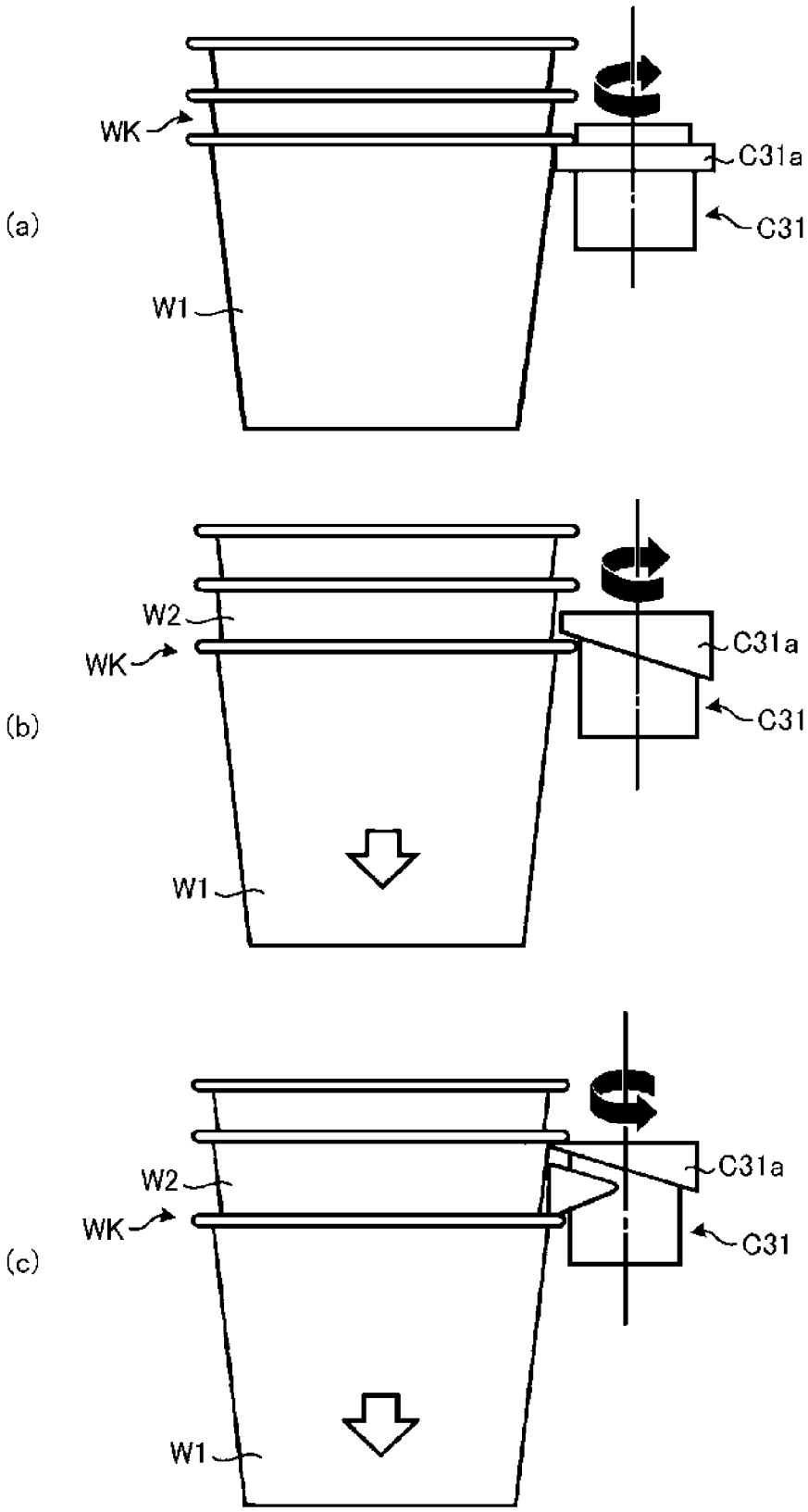


图11

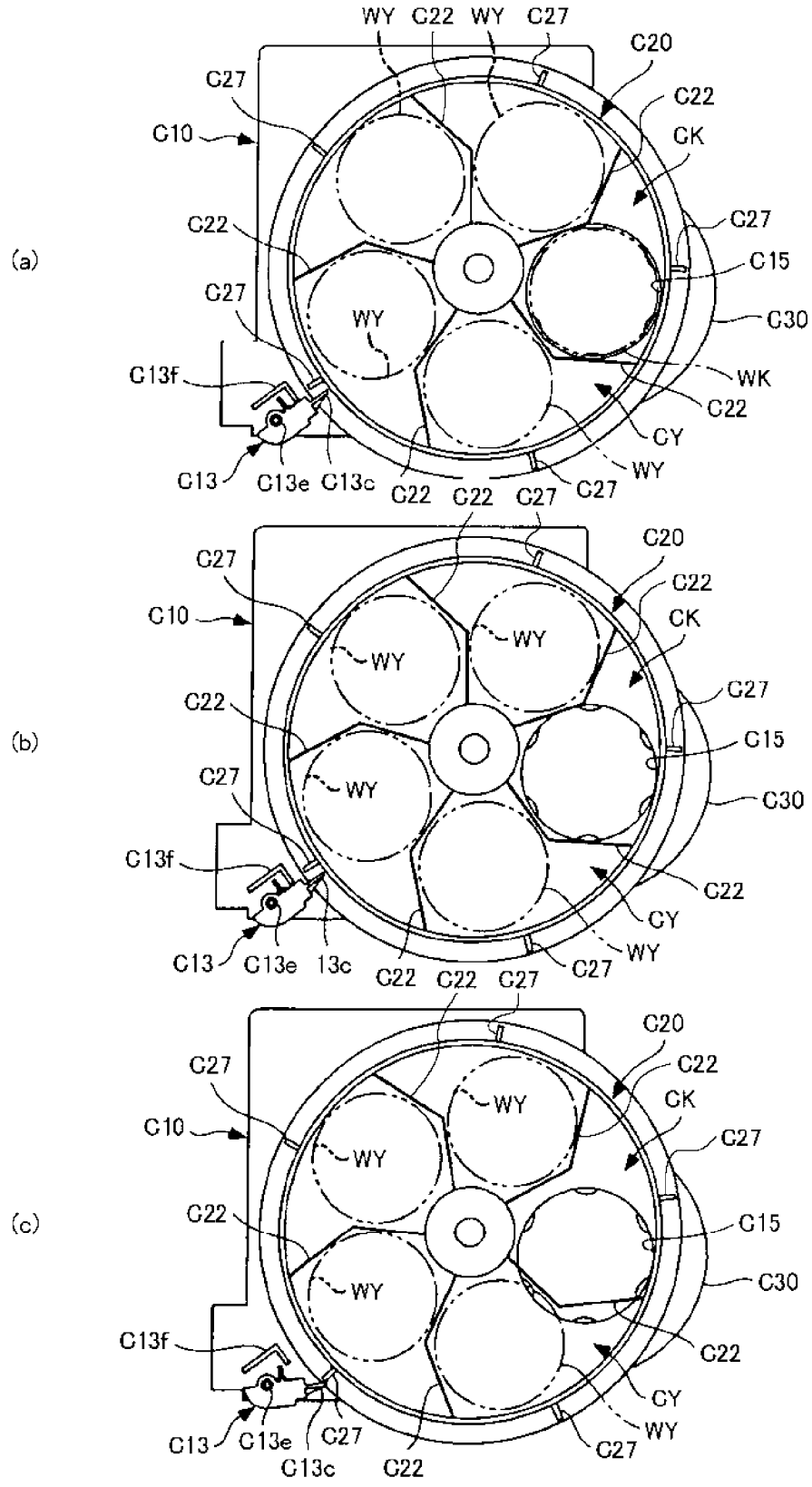


图12

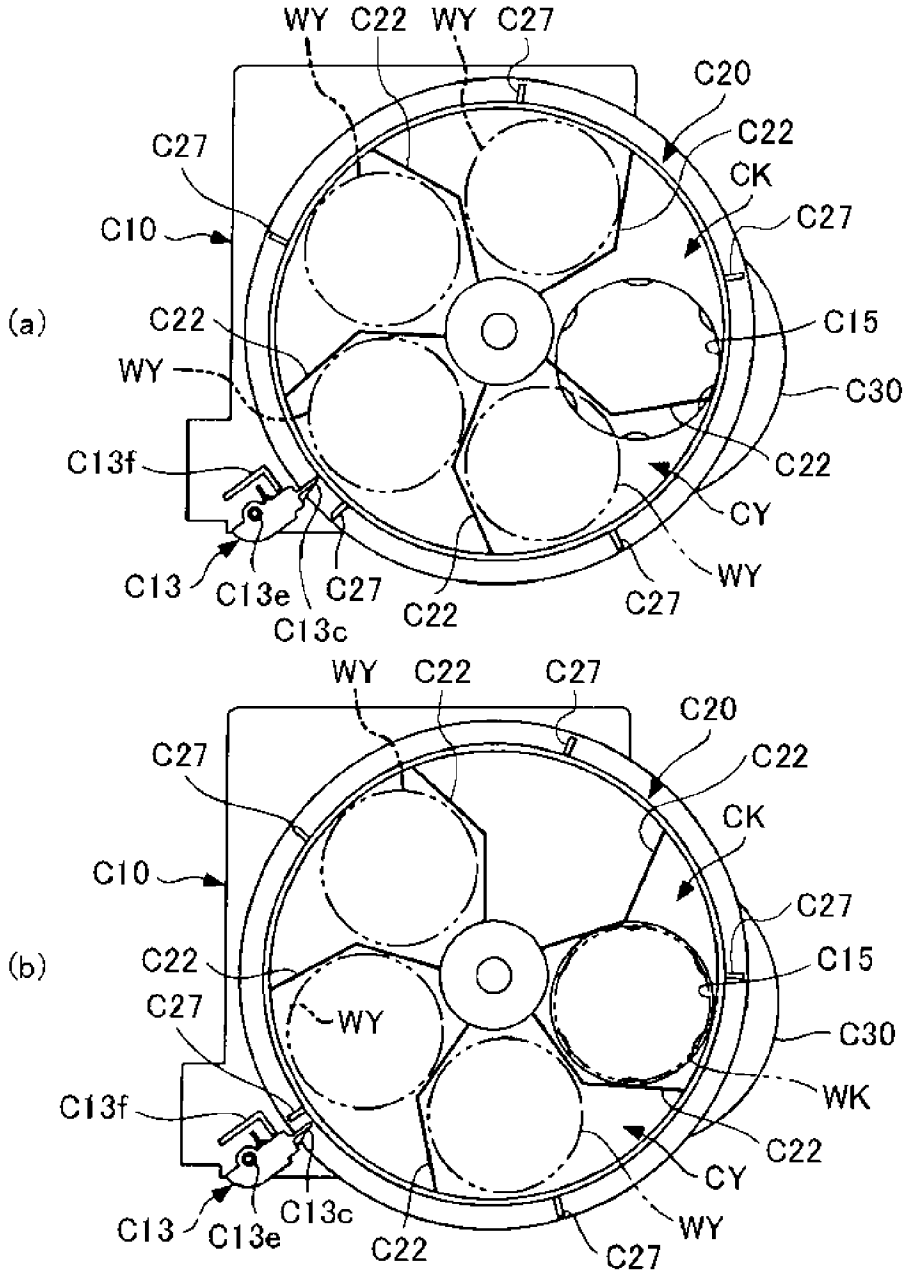


图13

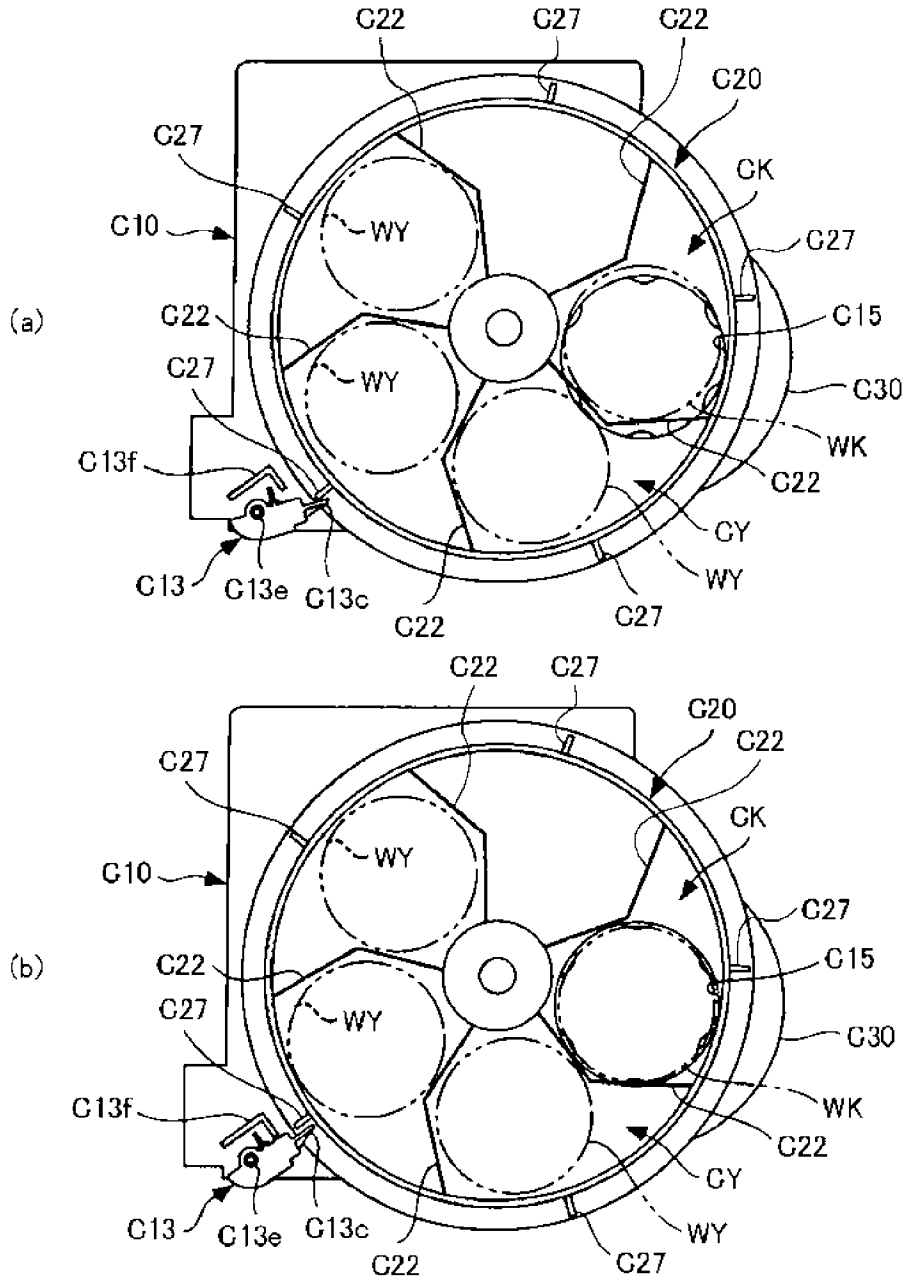


图14

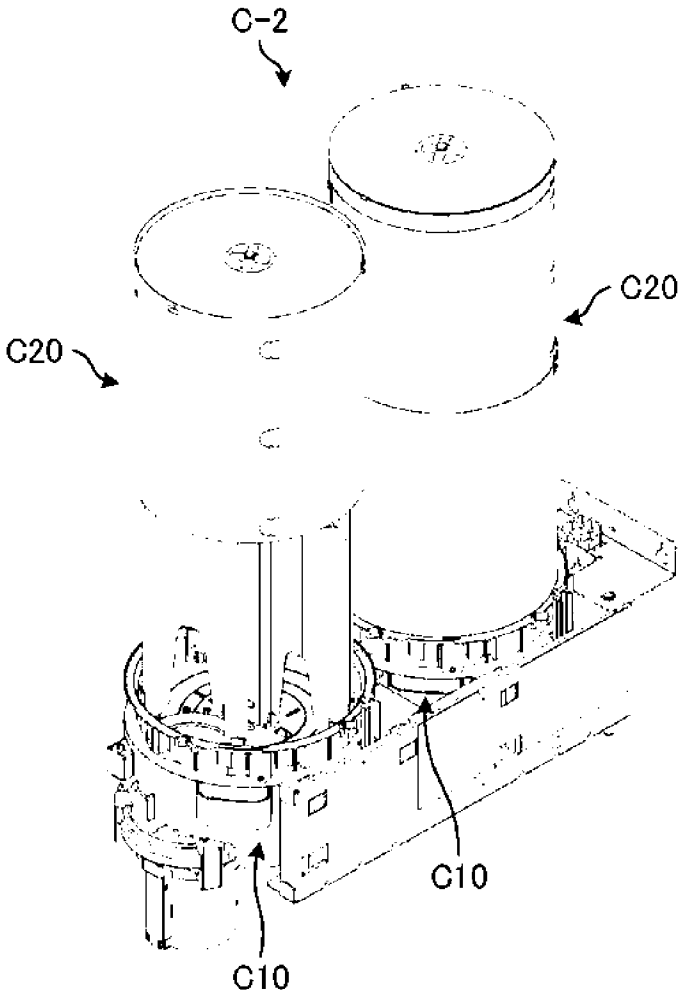


图15

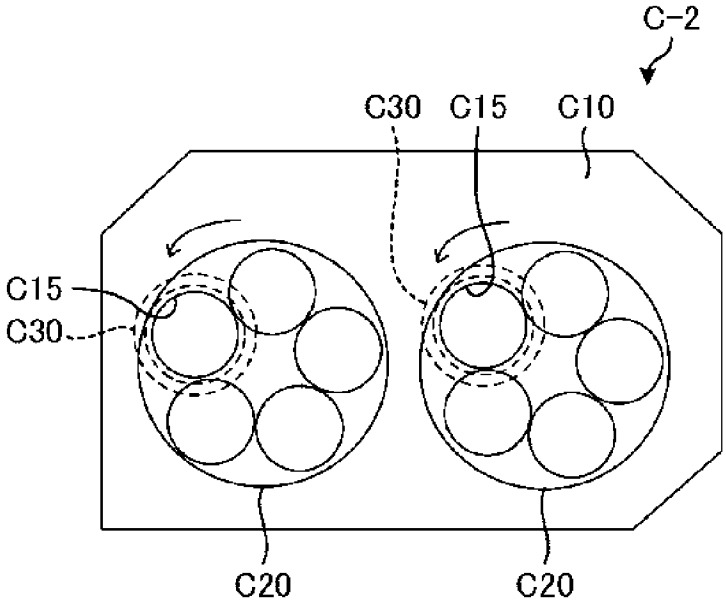


图16

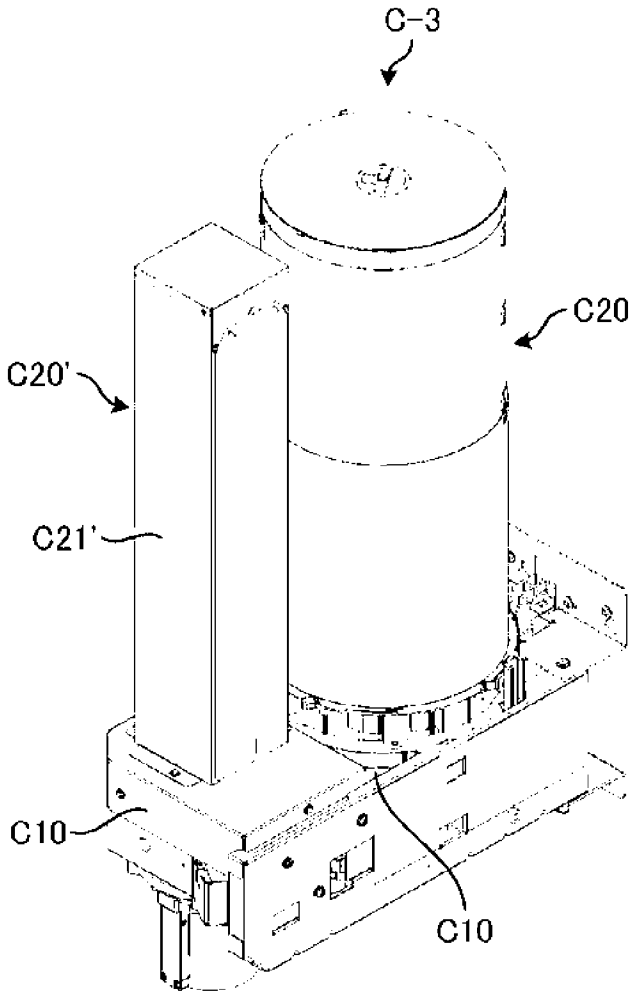


图17

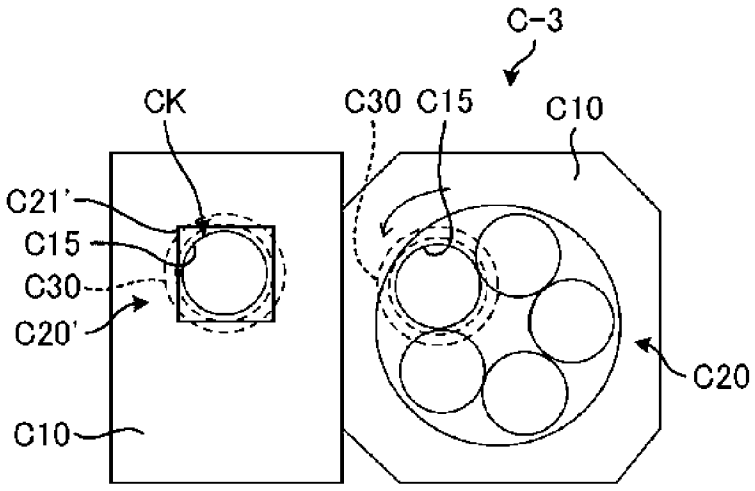


图18

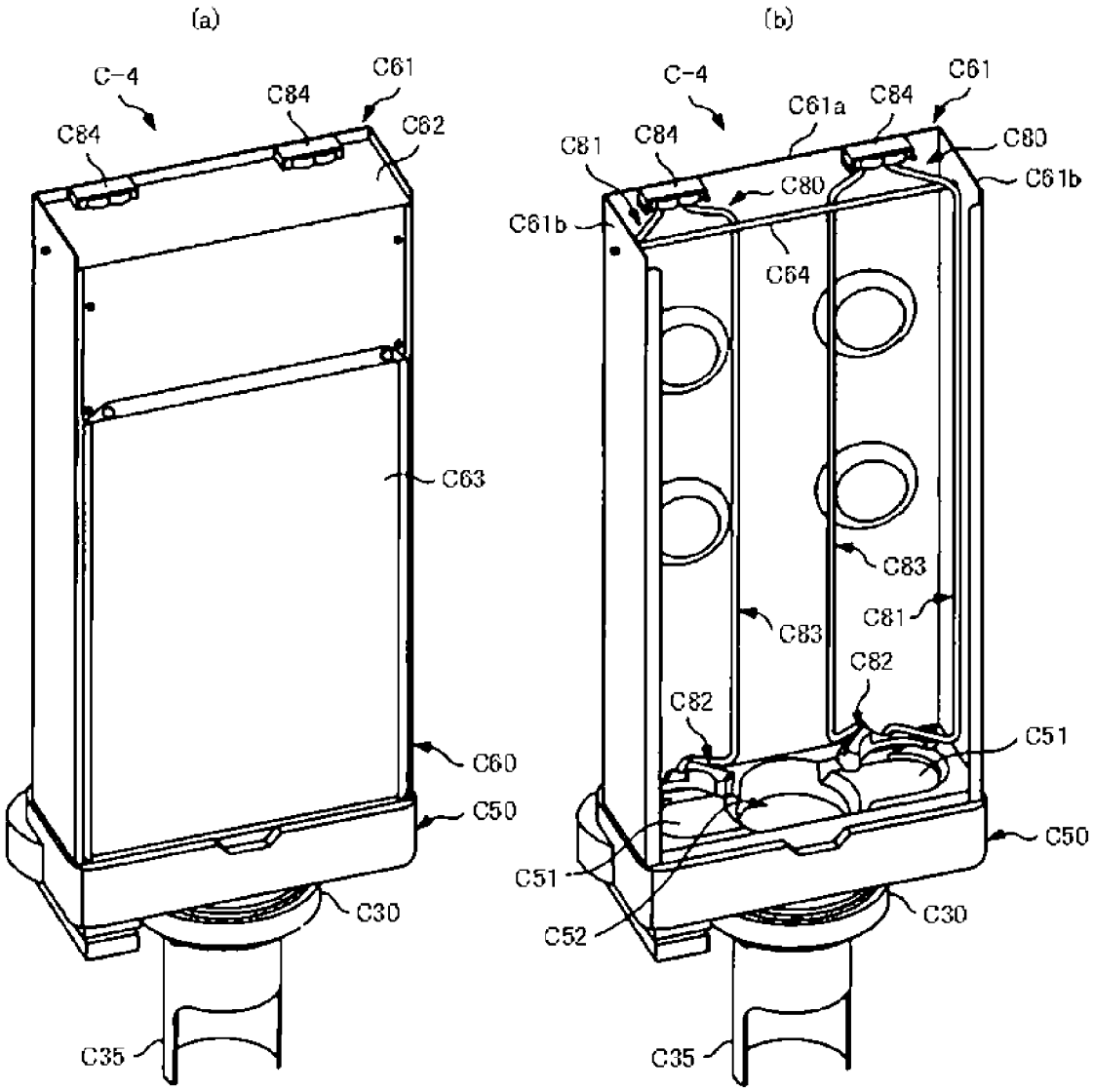


图19

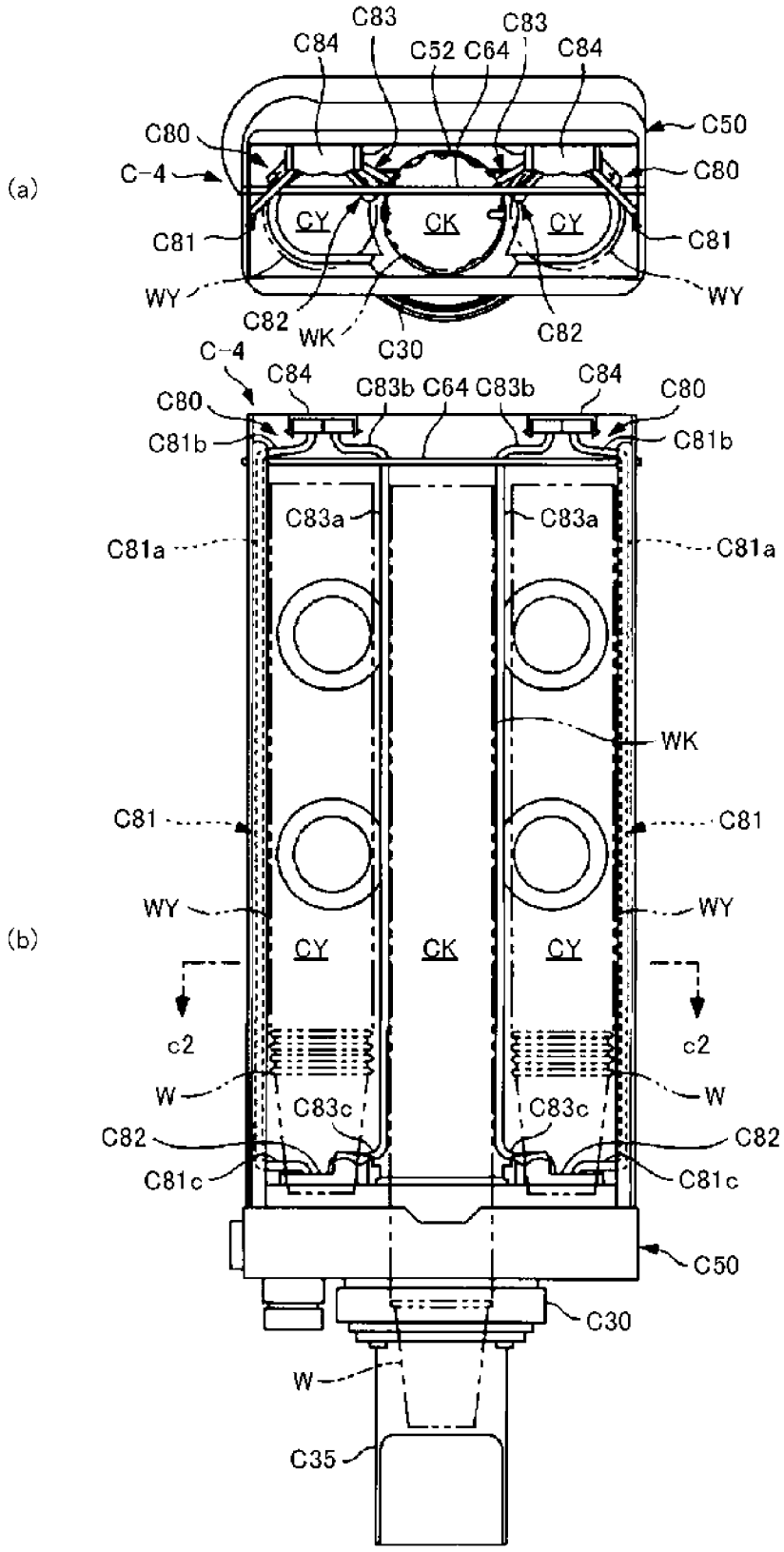


图20

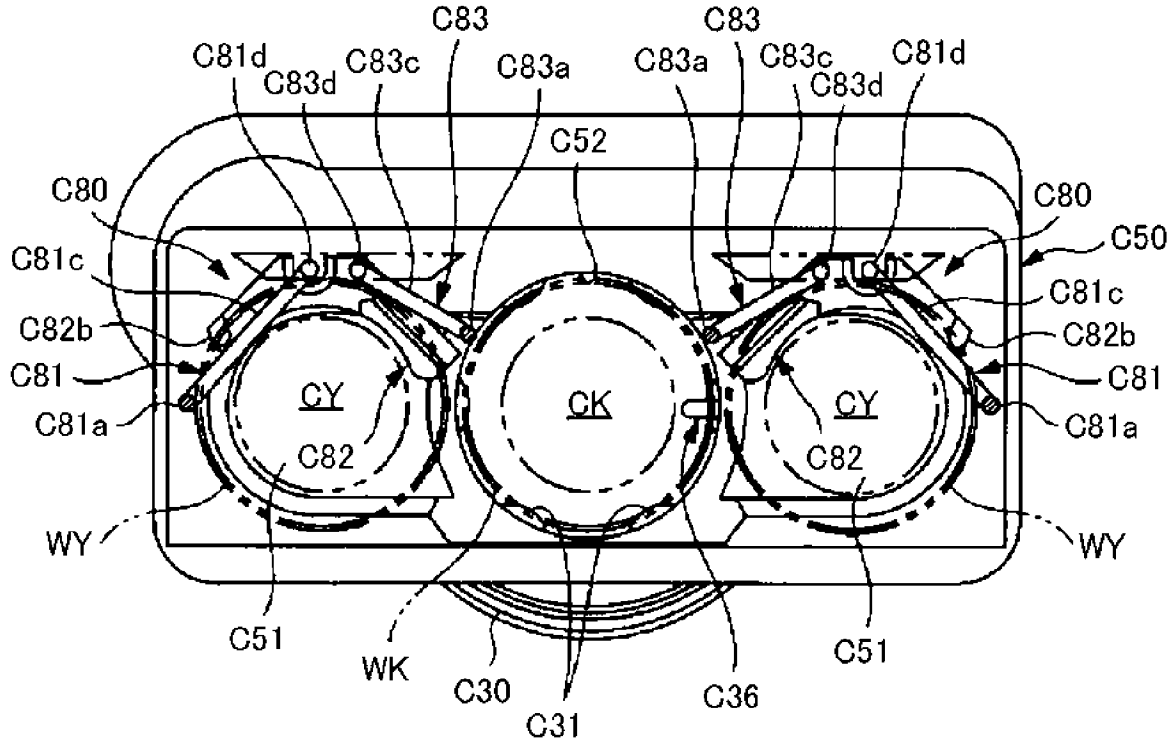


图21

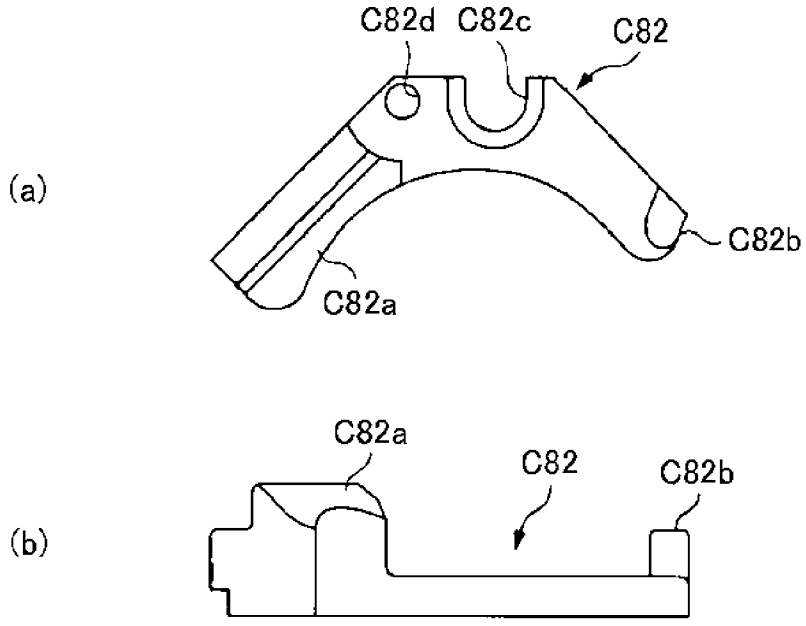


图22

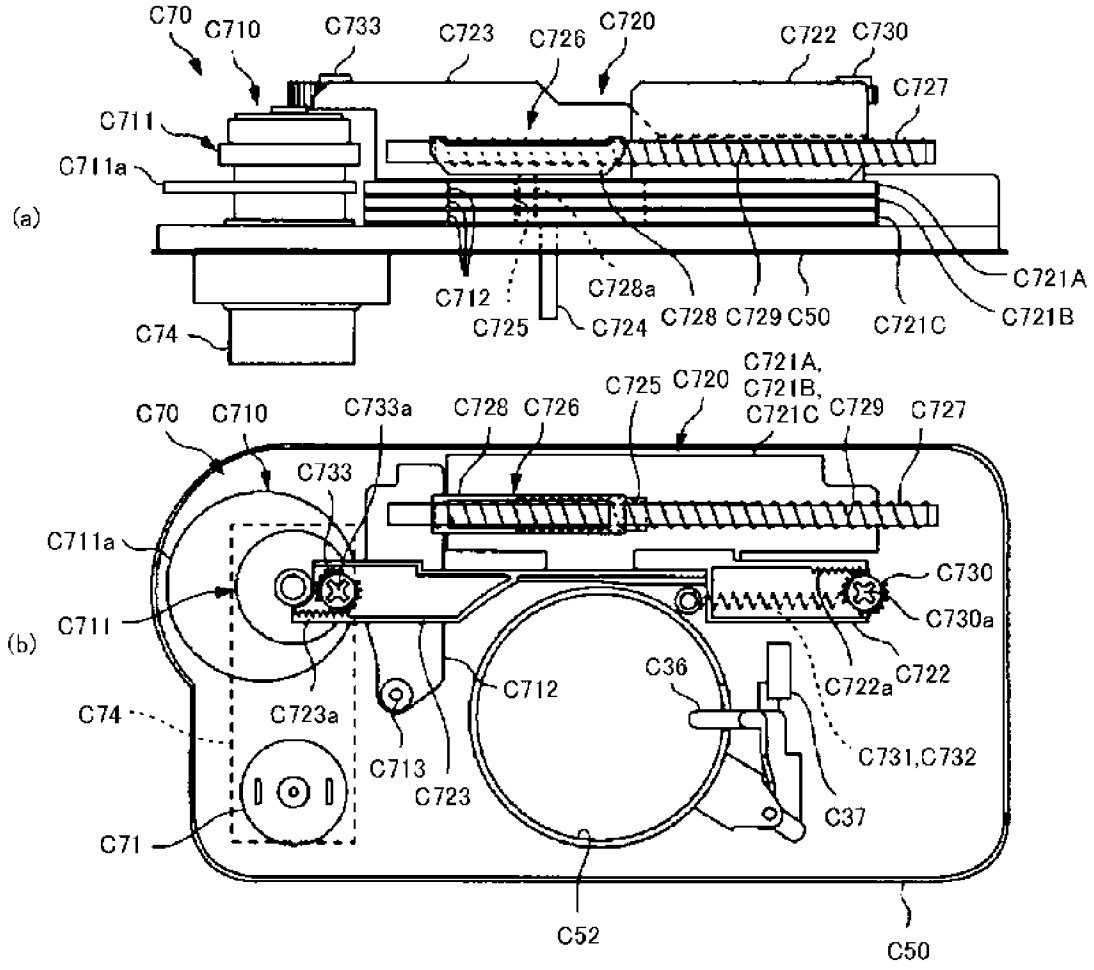


图23

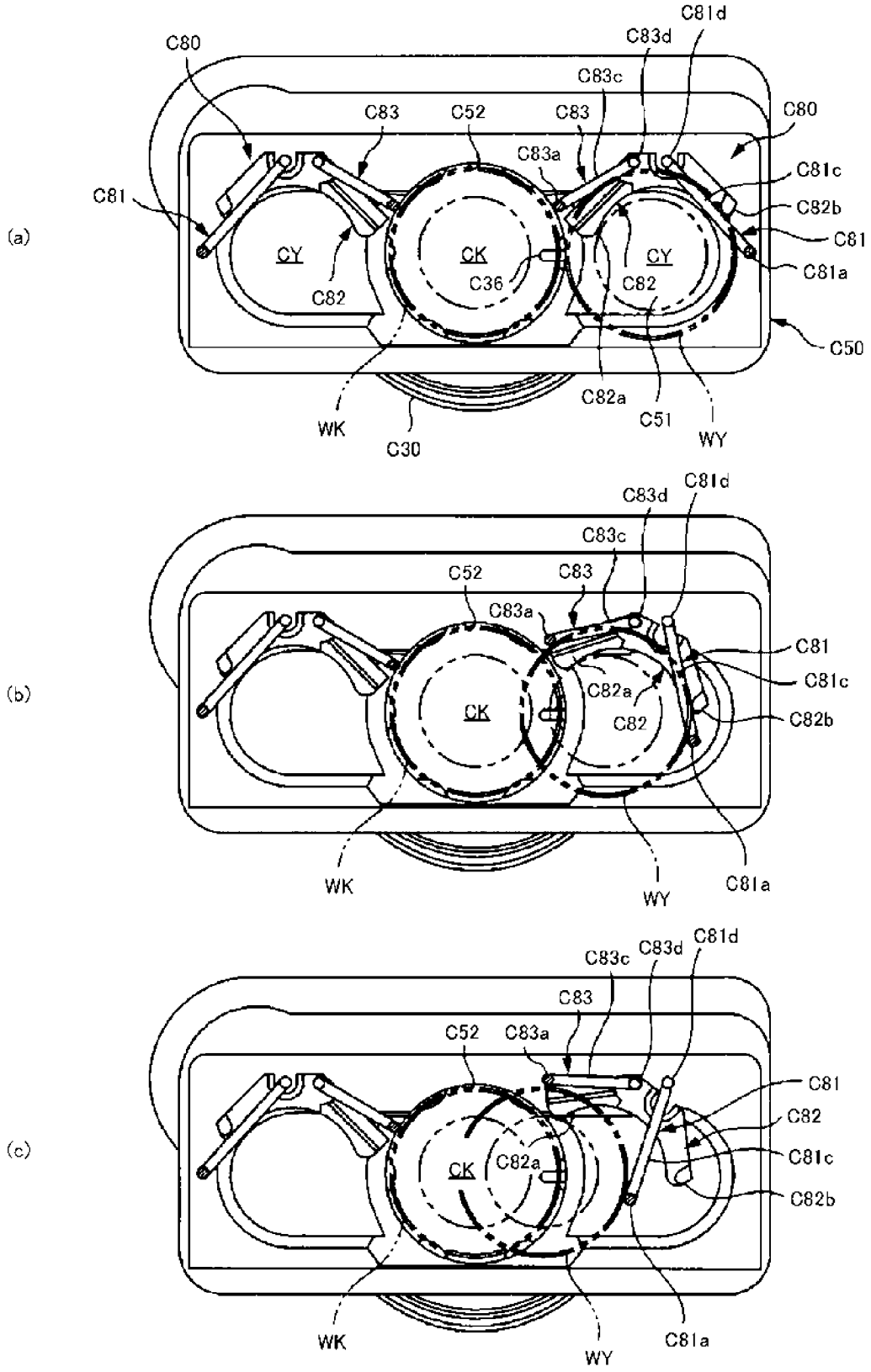


图24

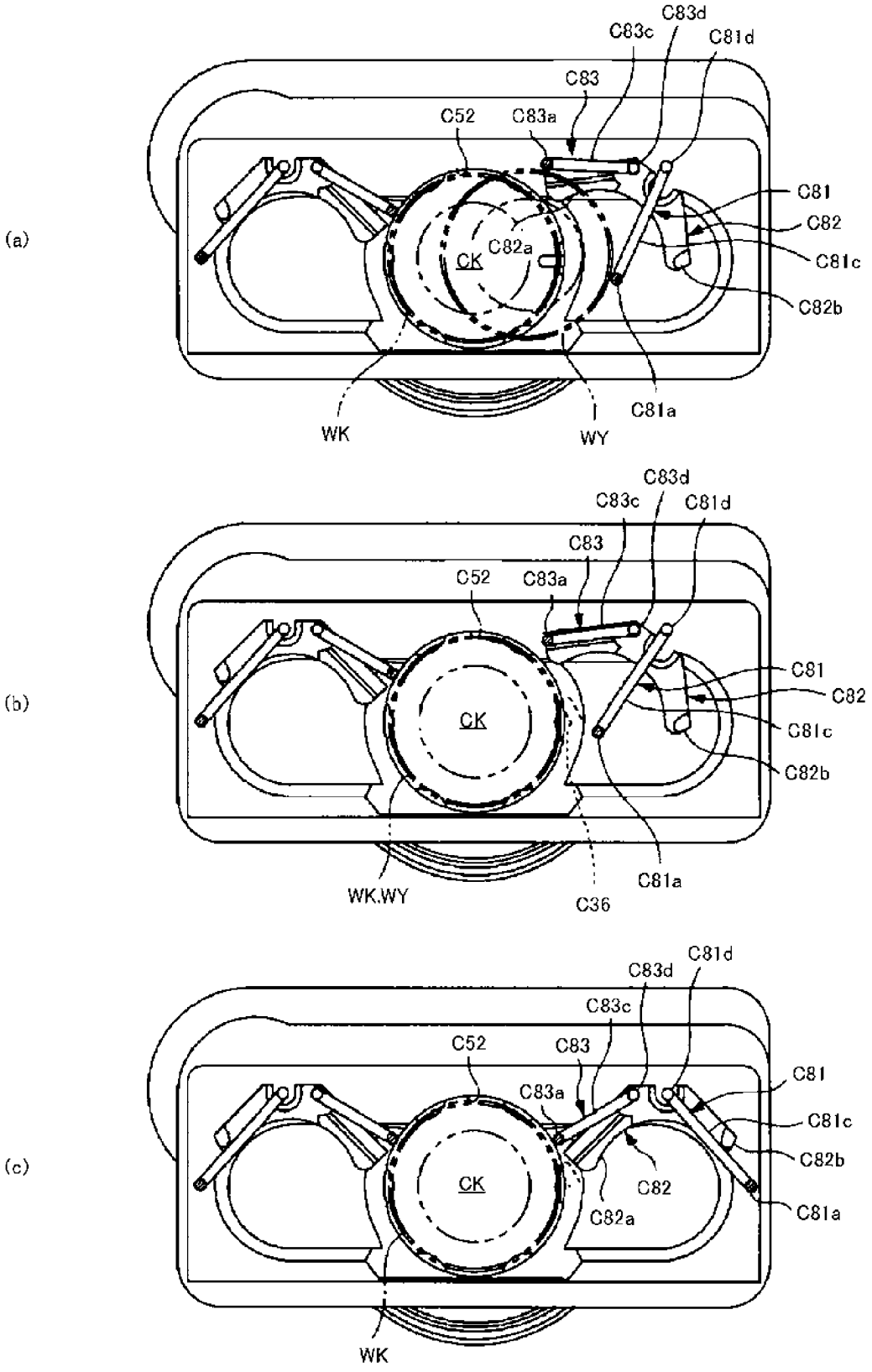


图25

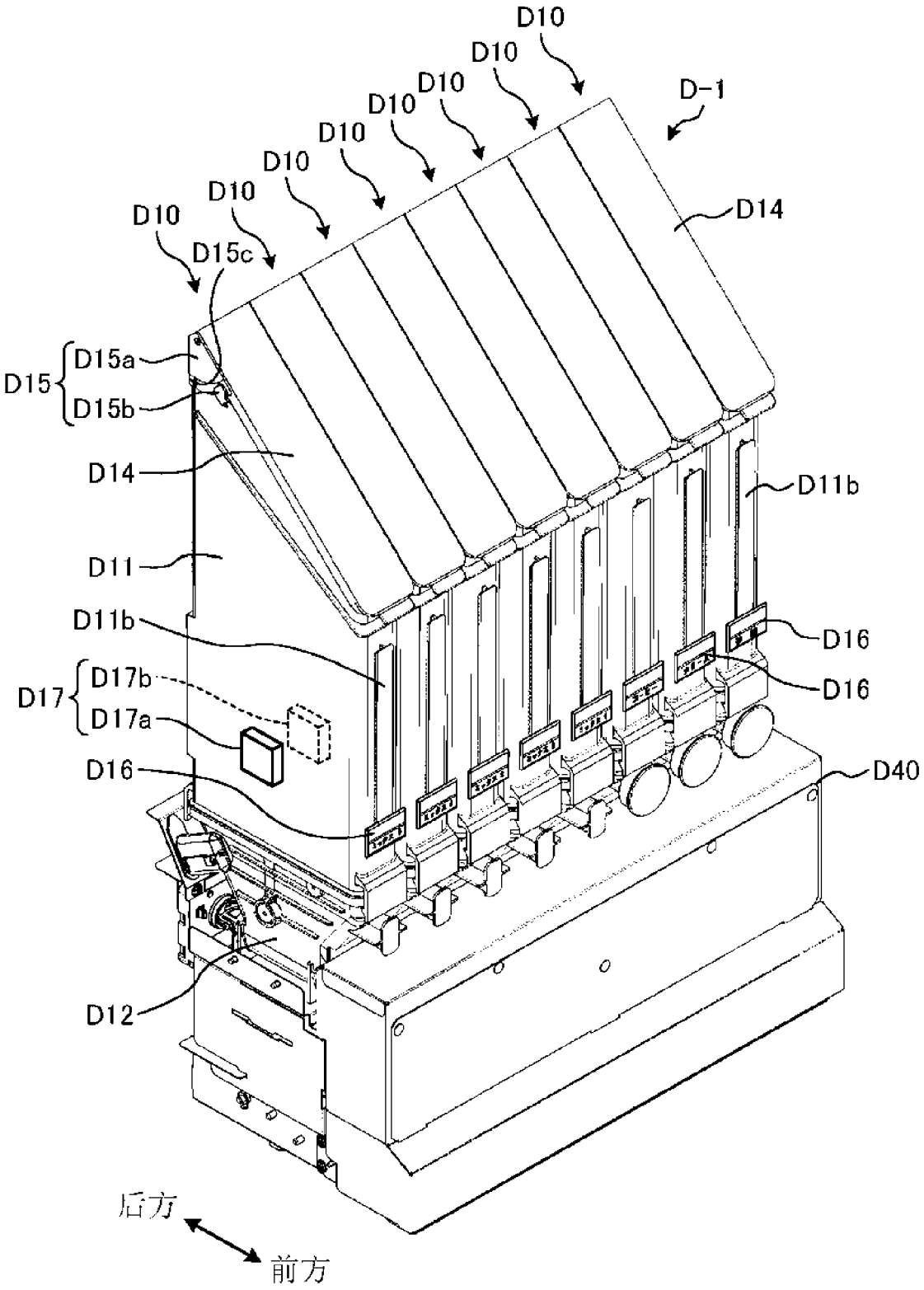


图26

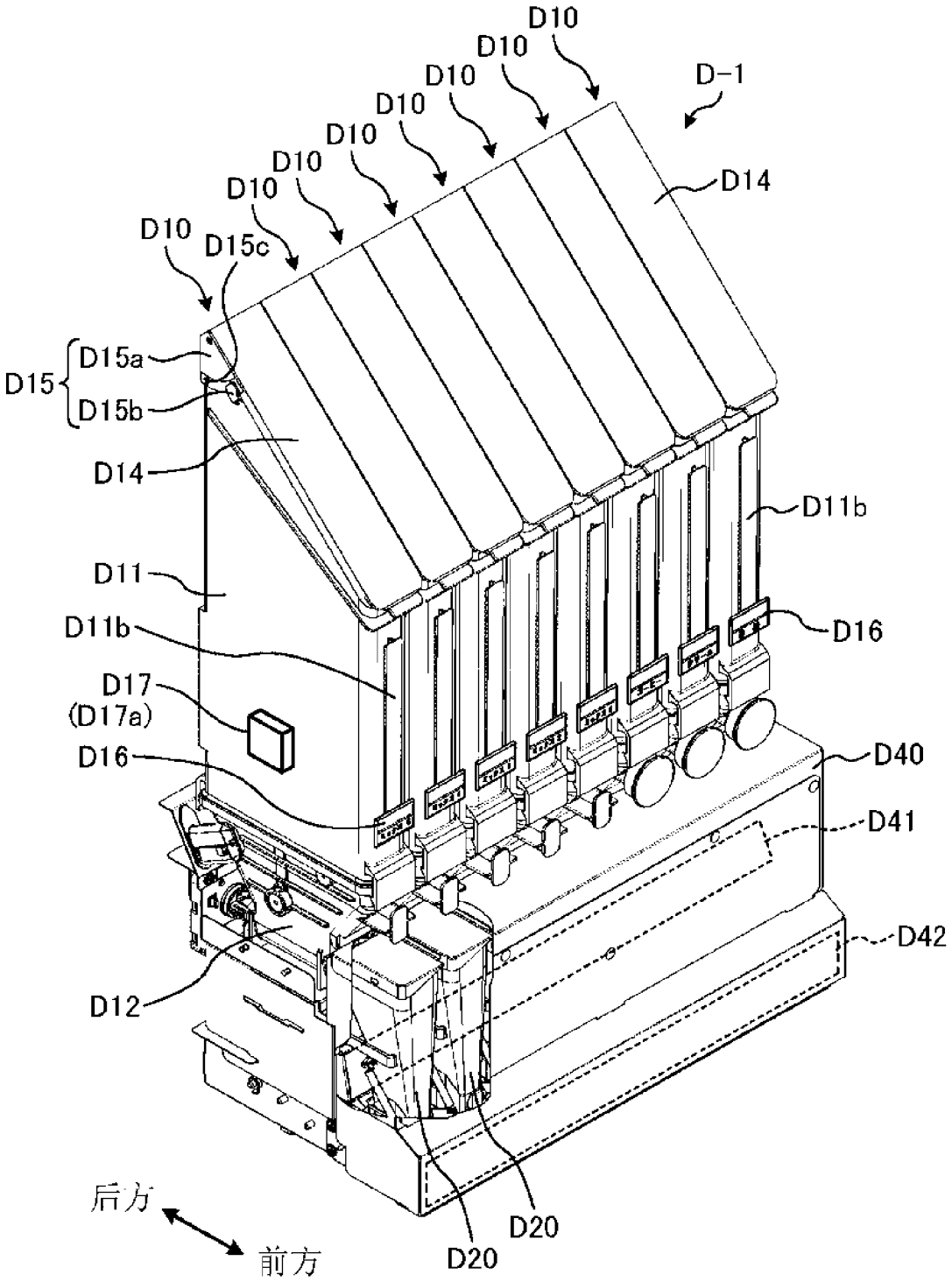


图27

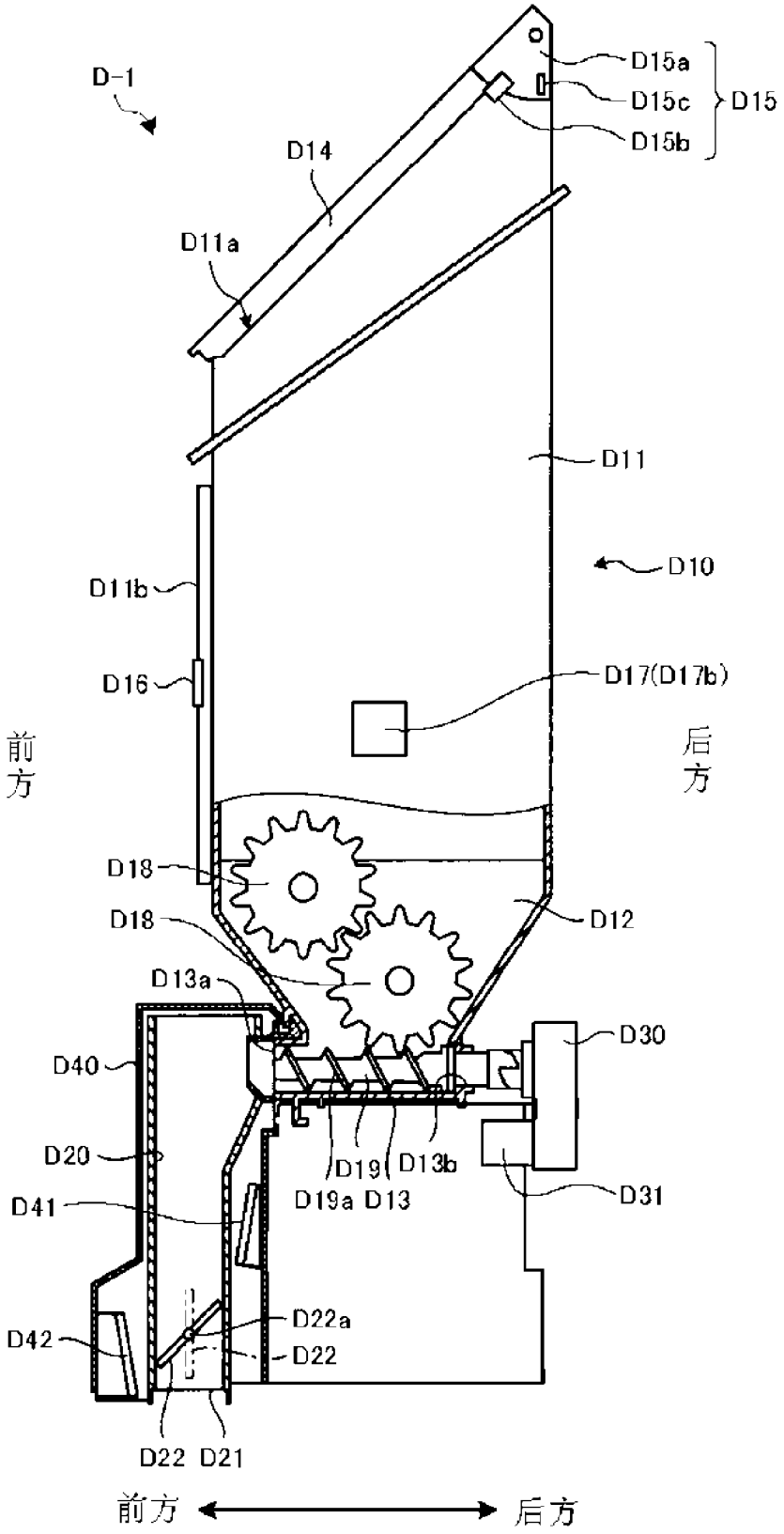


图28

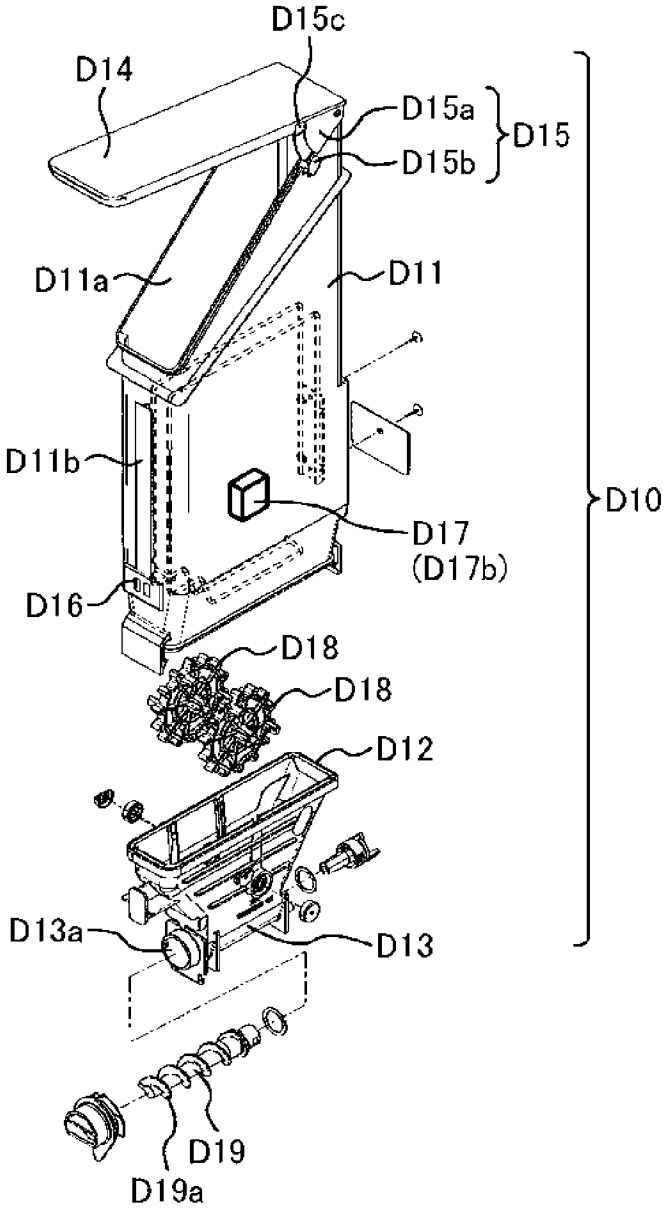


图29

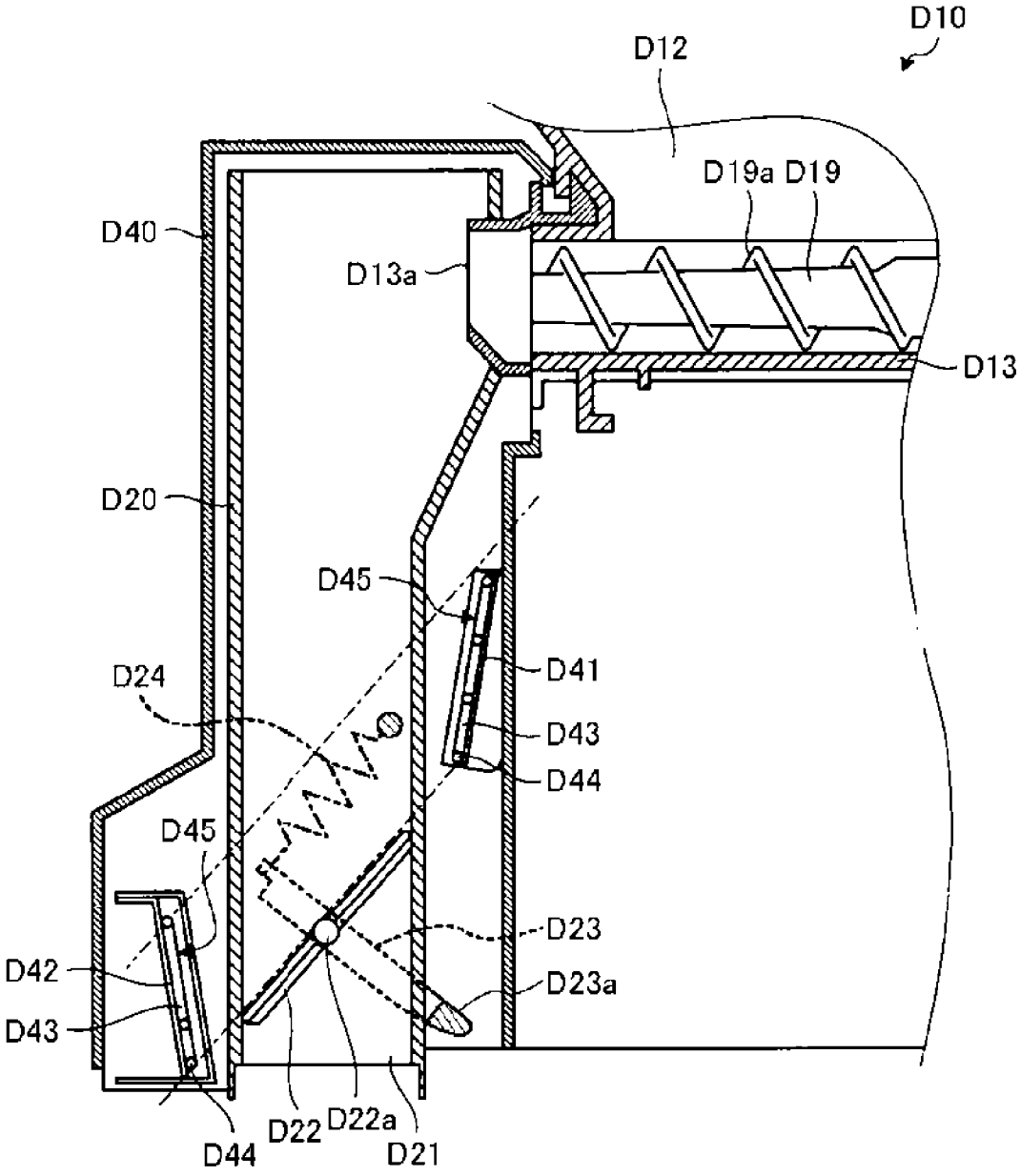


图30

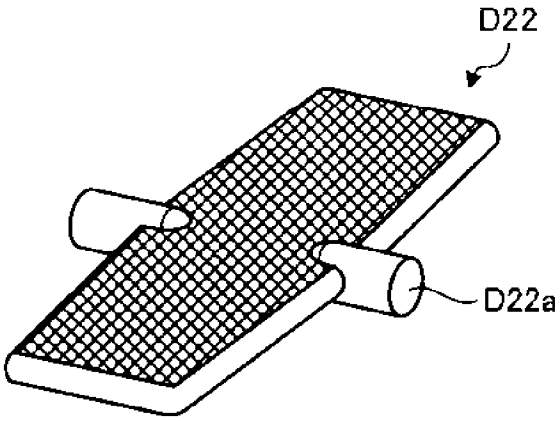


图31

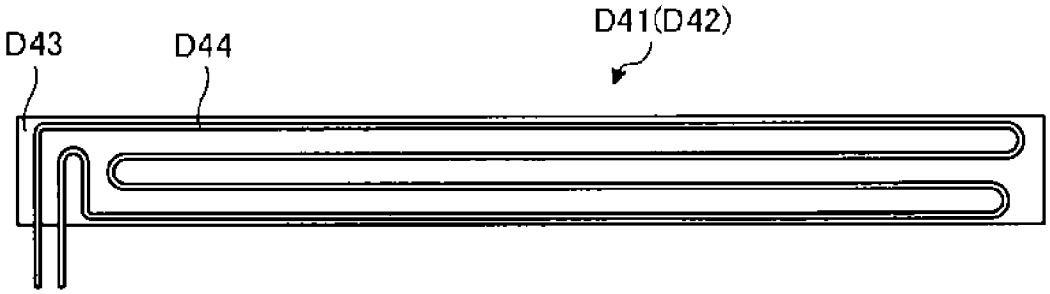


图32

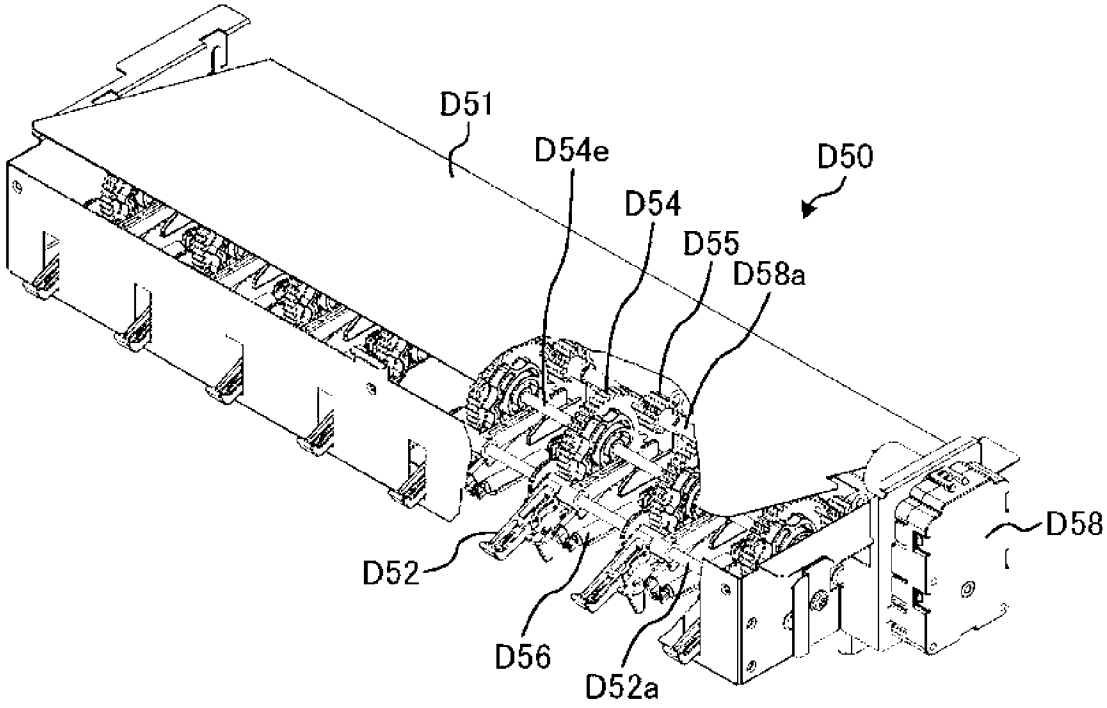


图33

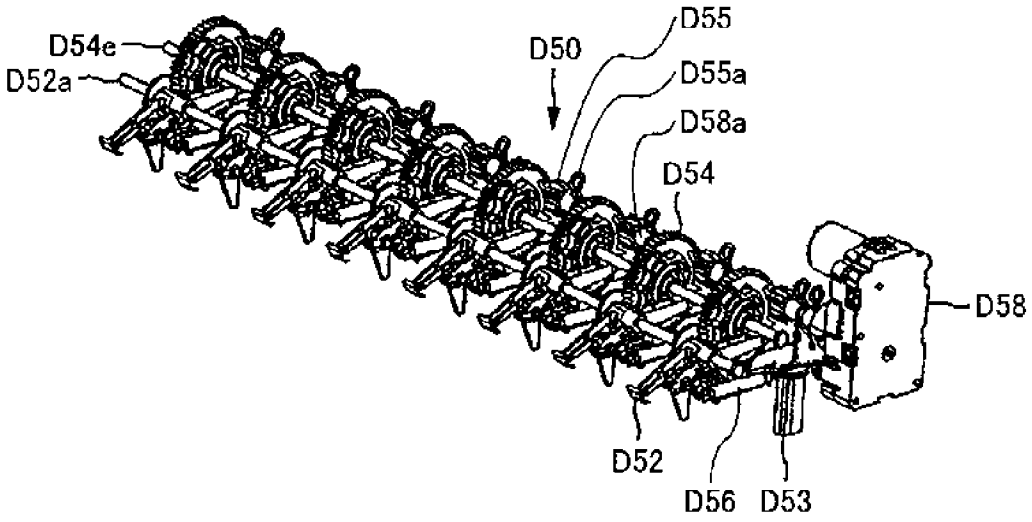


图34

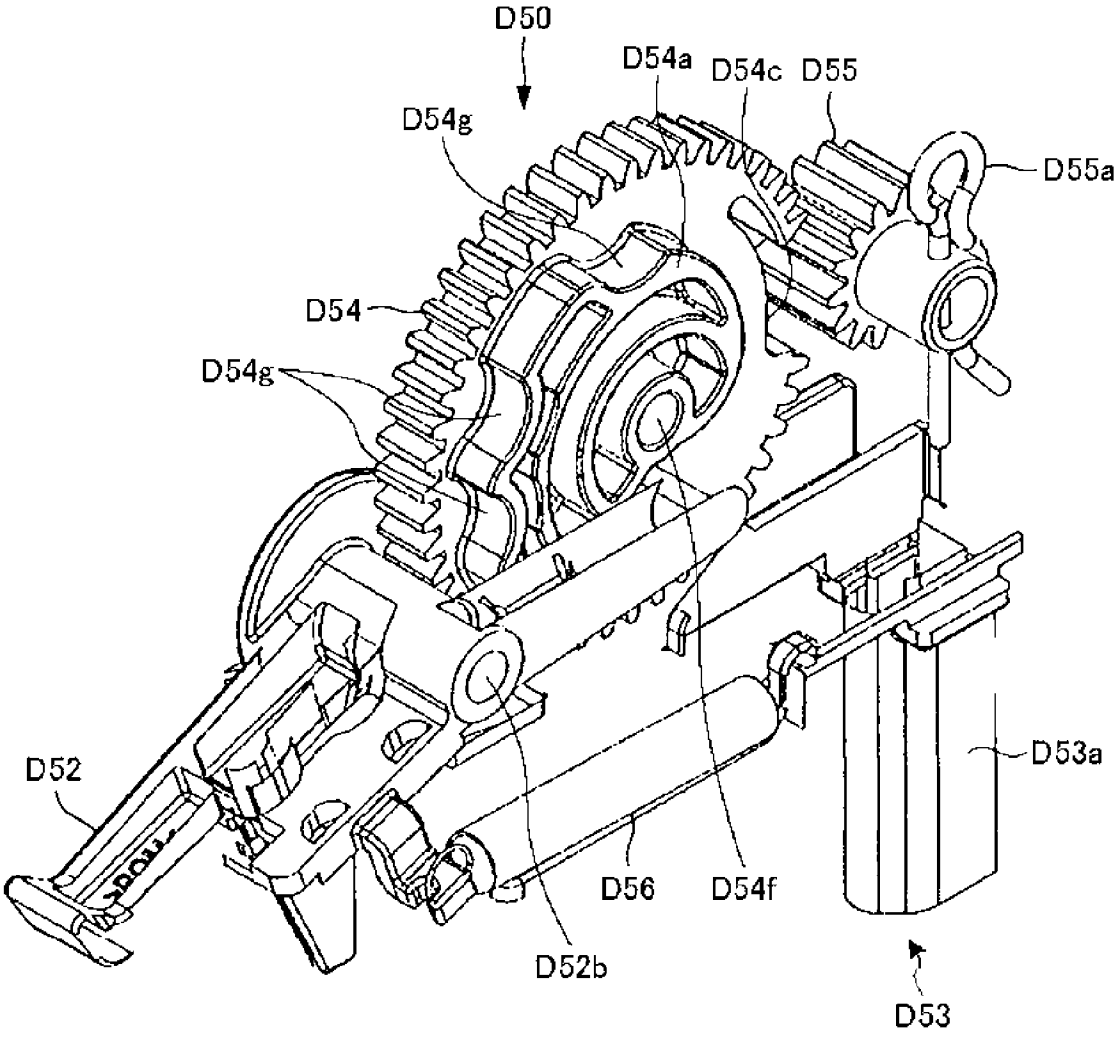


图35

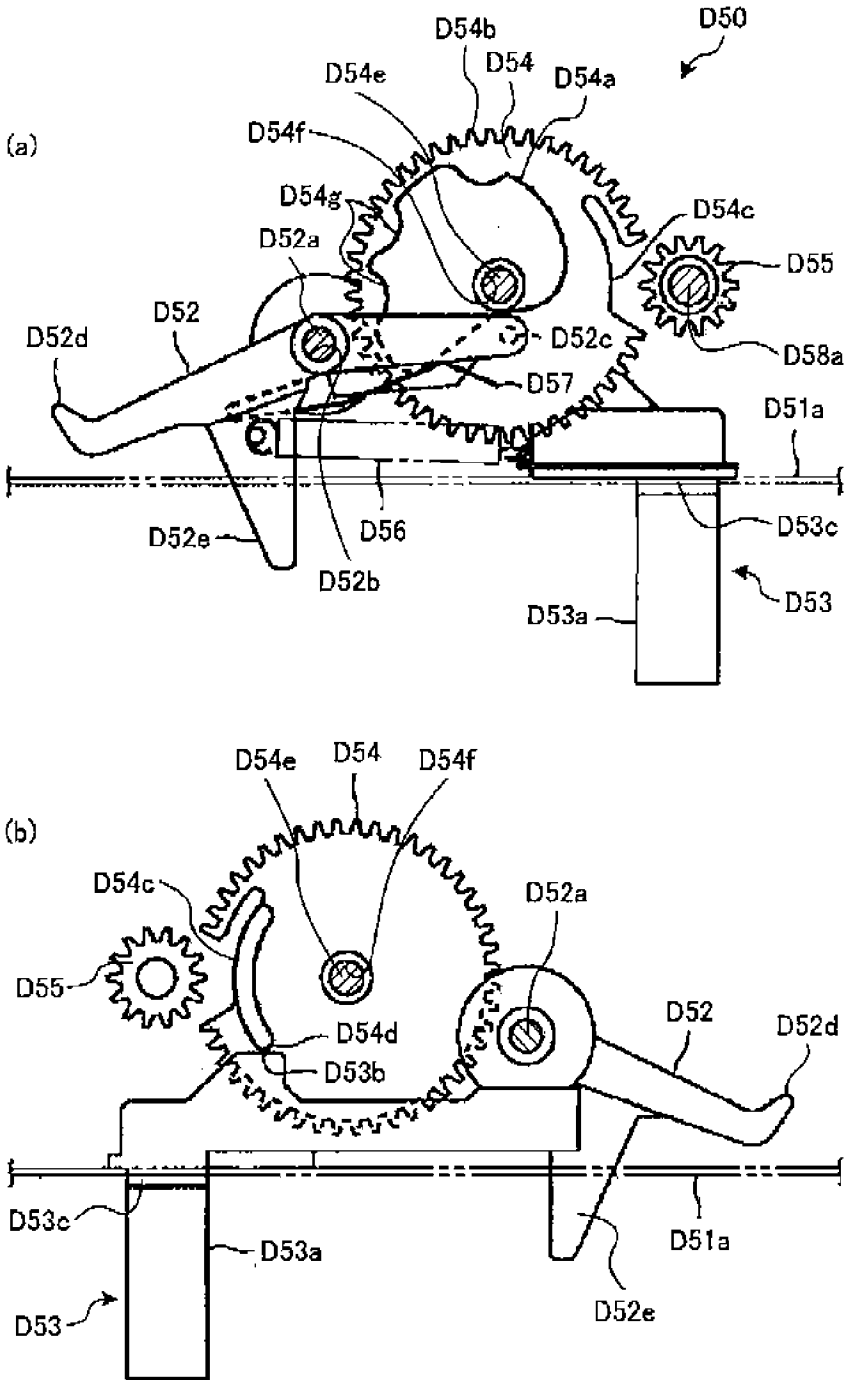


图36

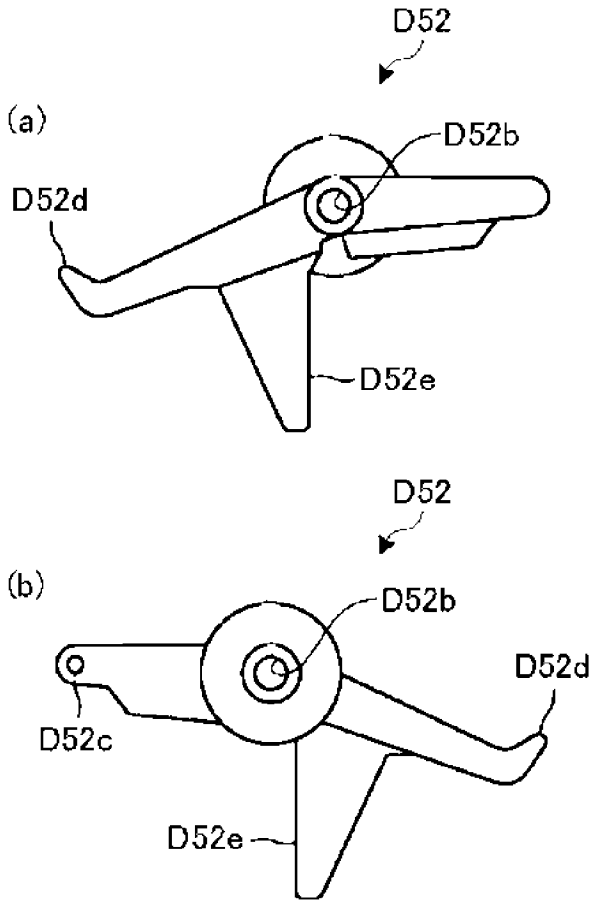
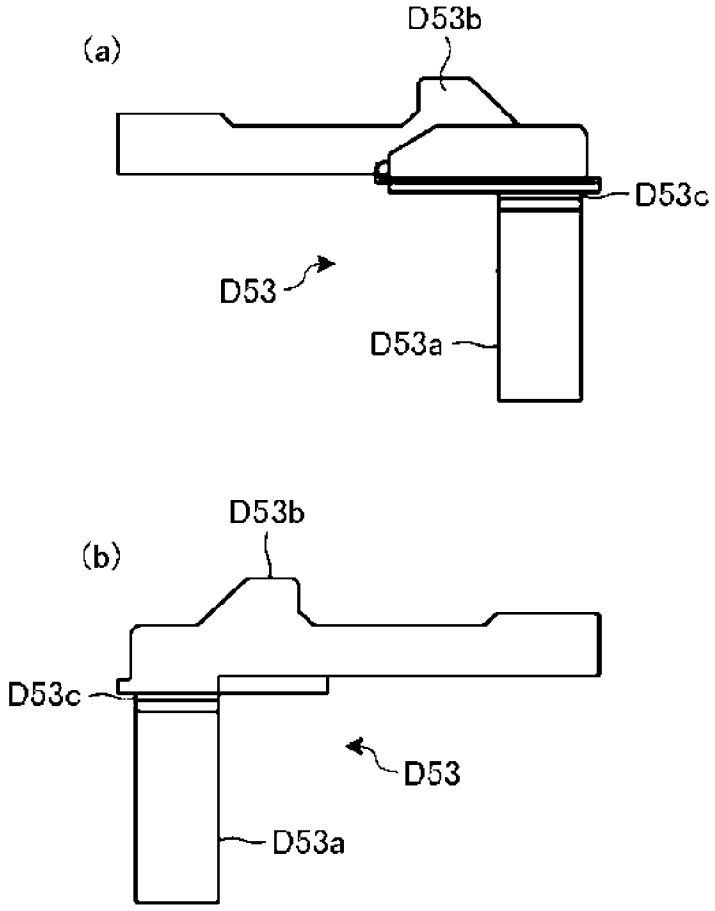


图37



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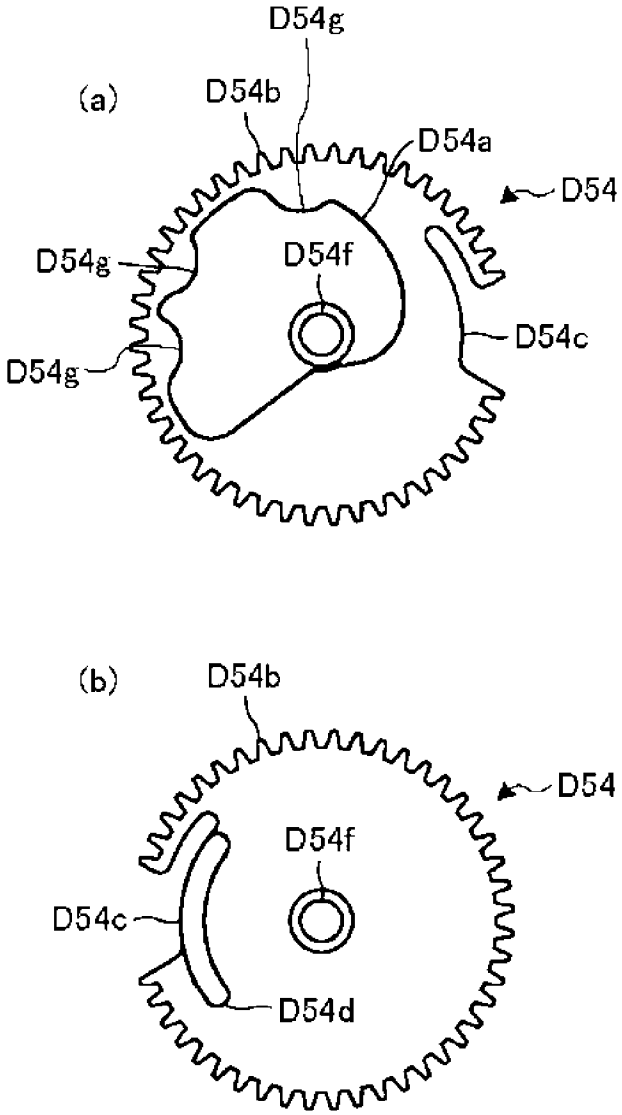

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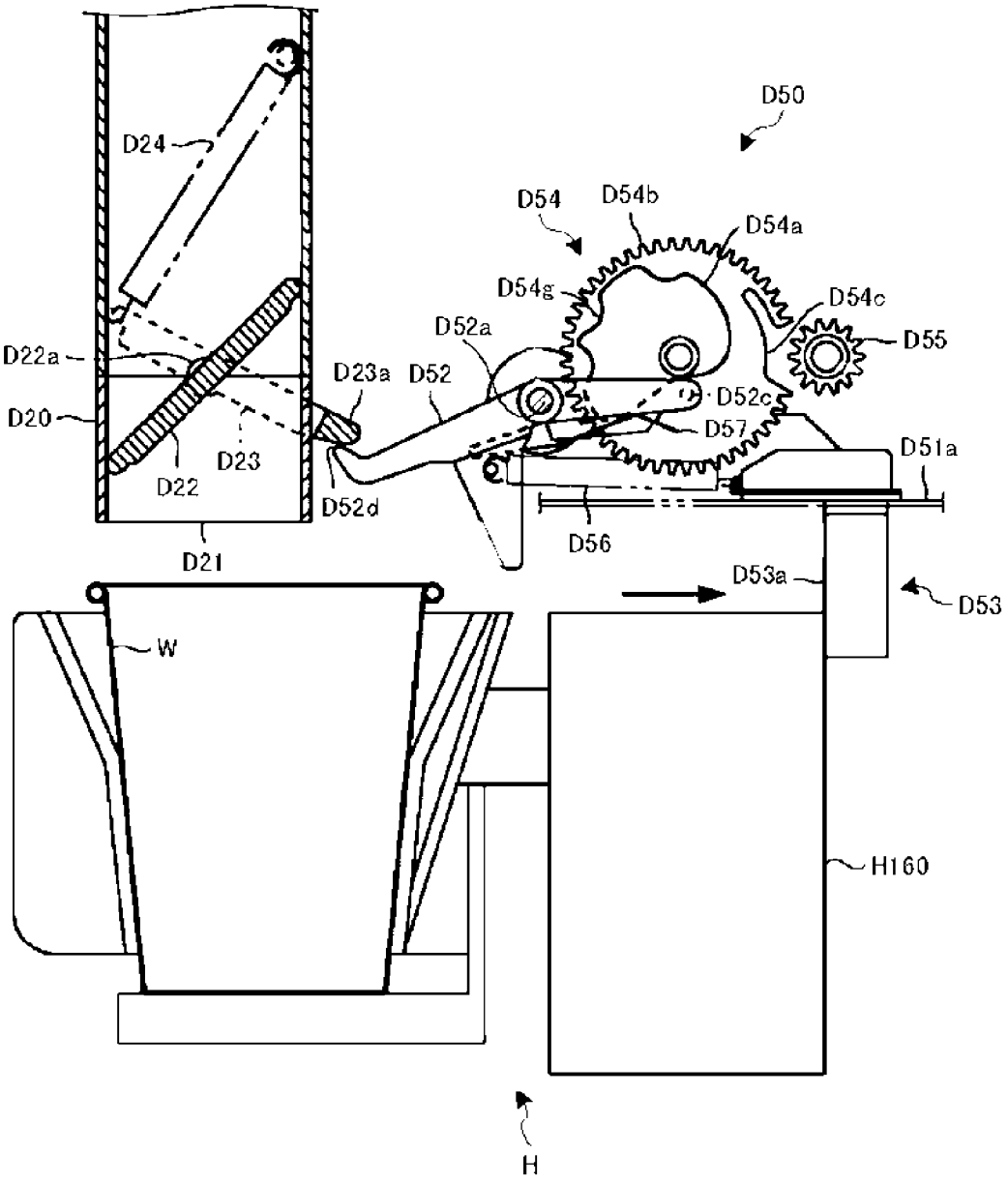

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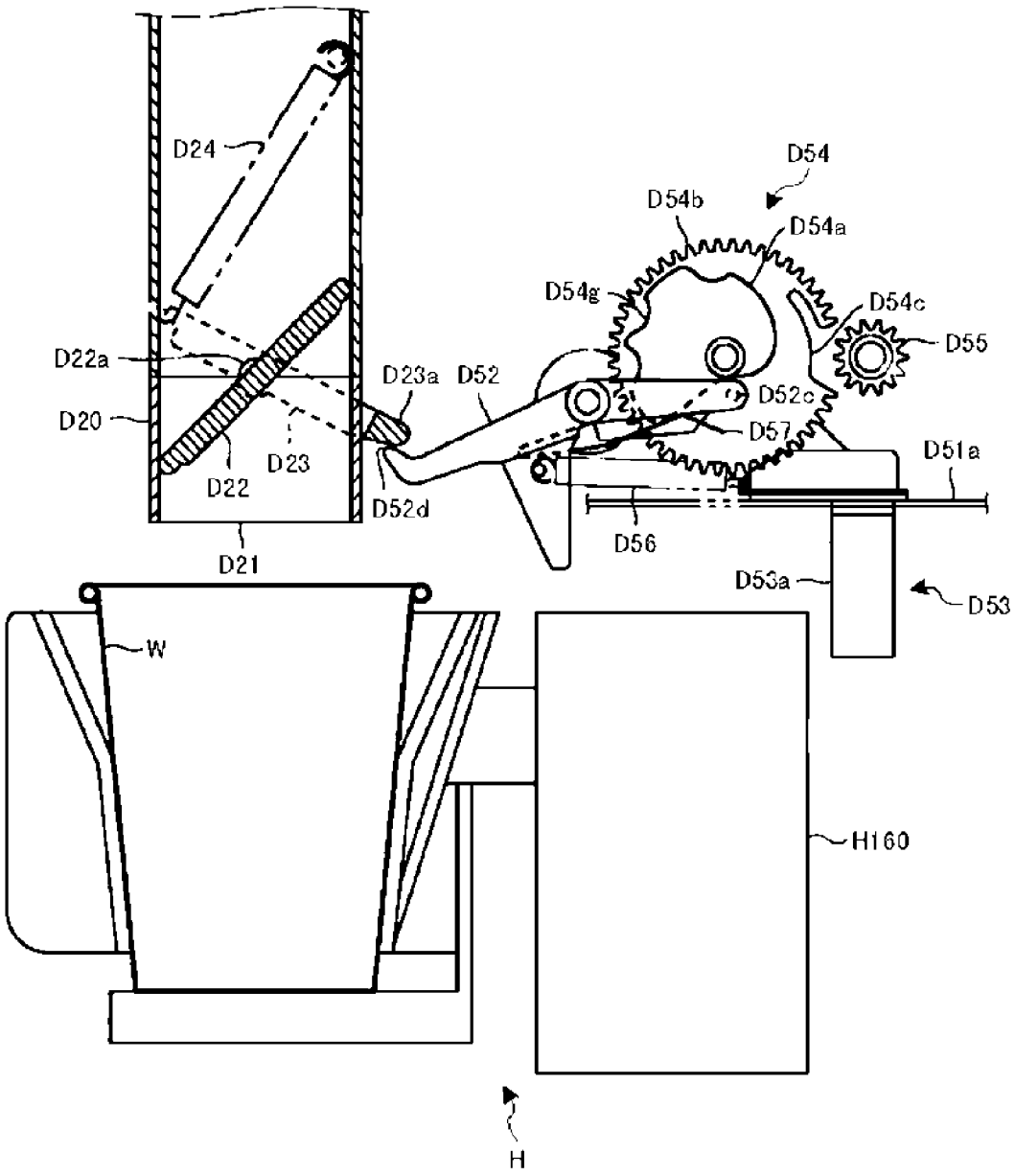

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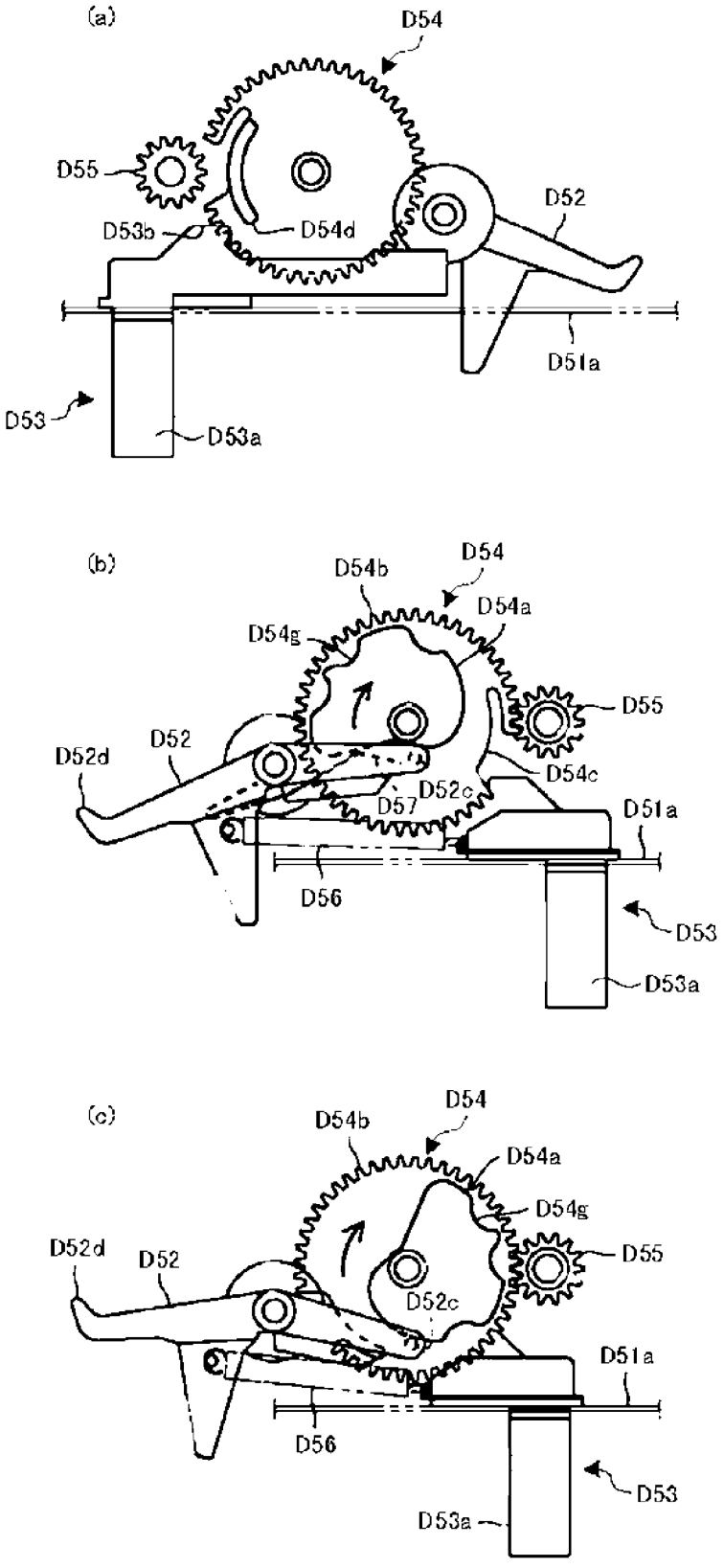

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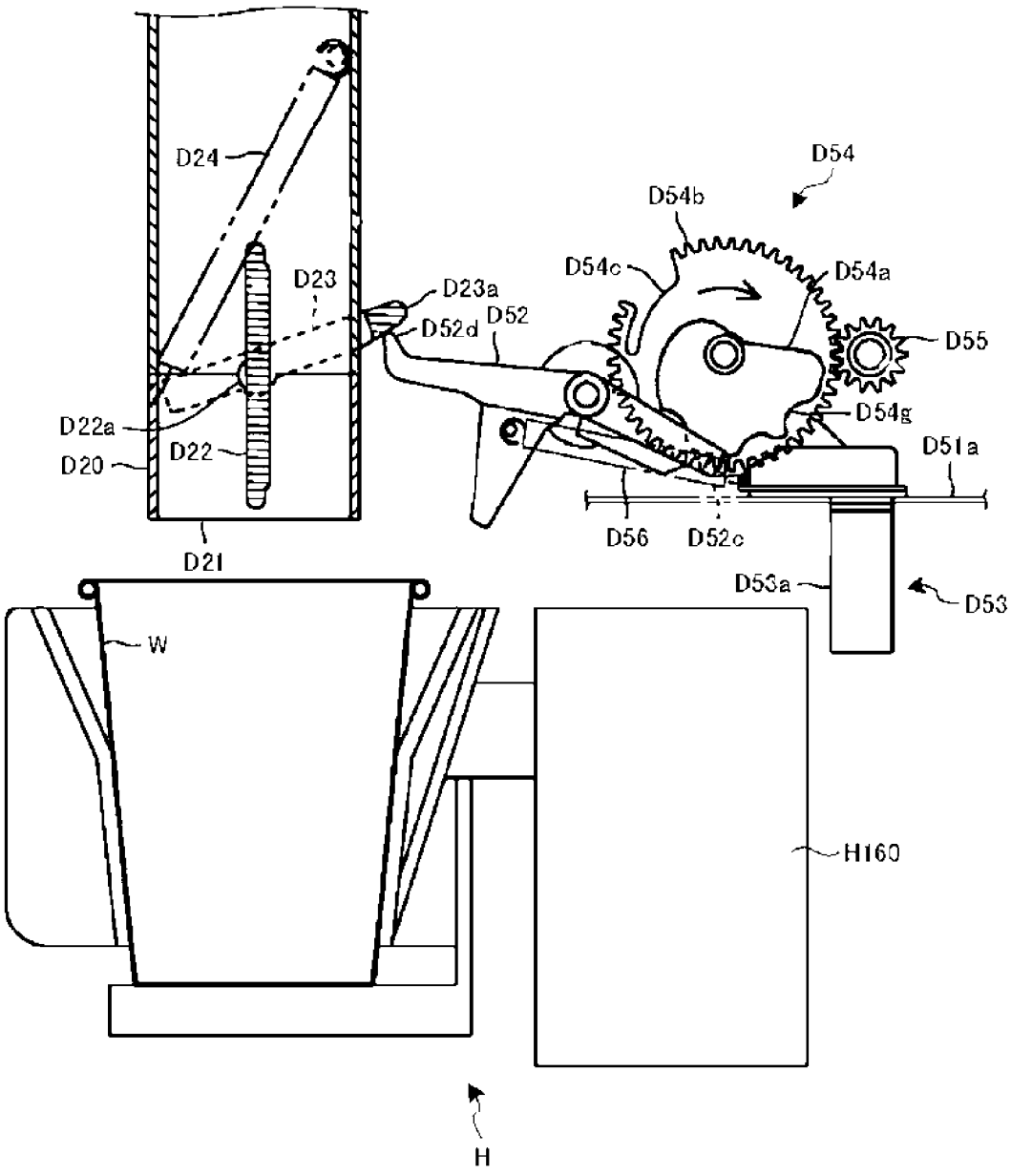


图43

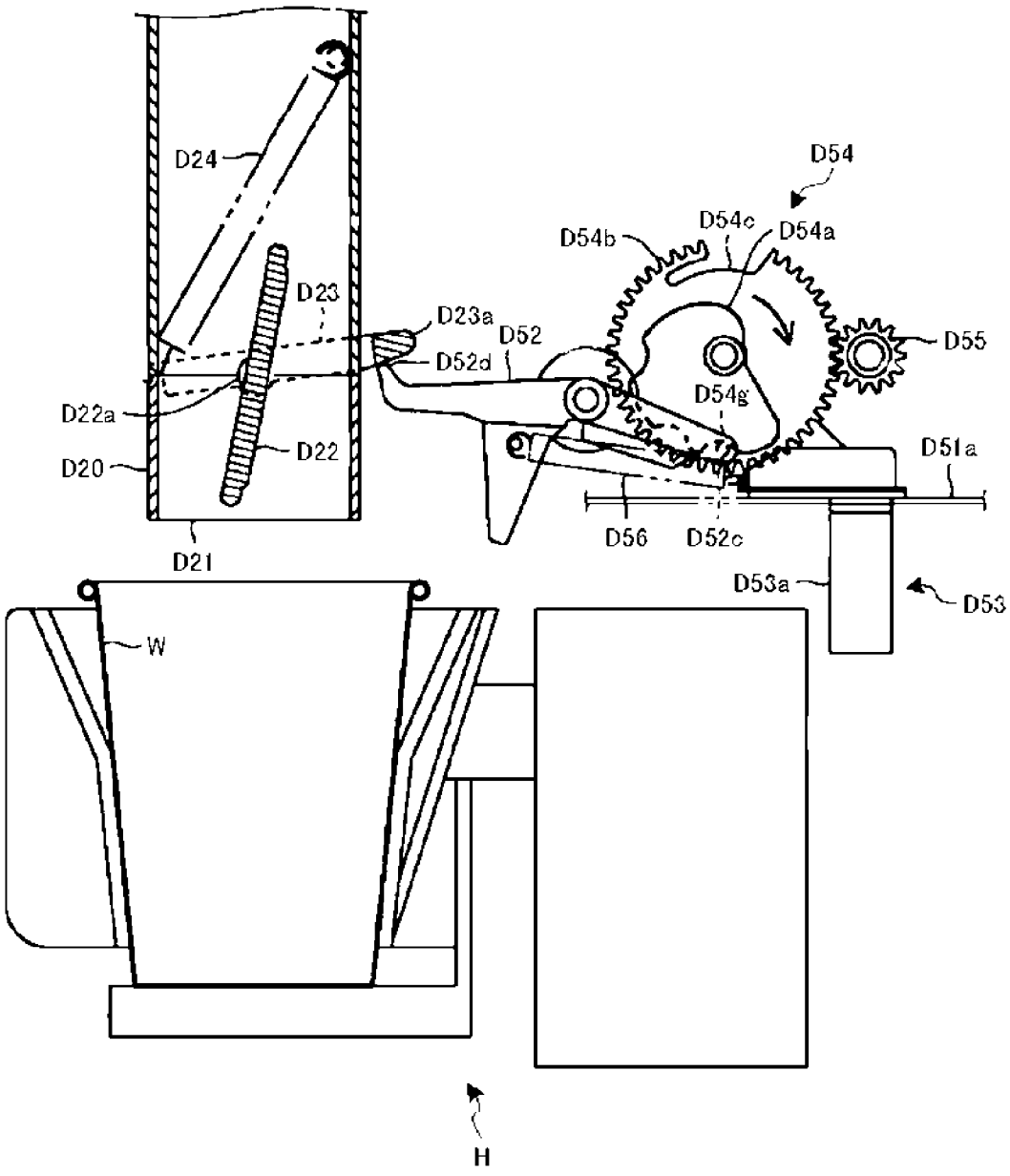


图44

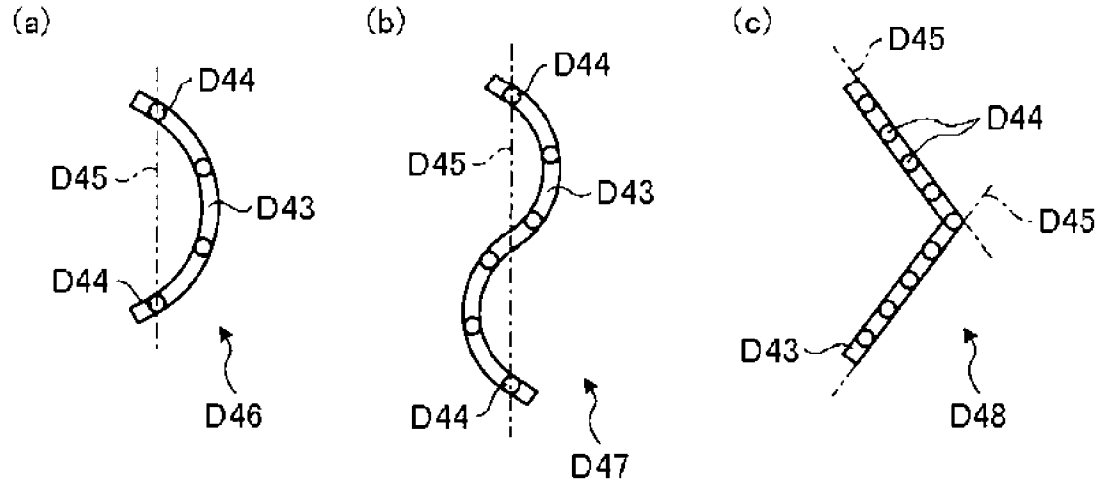


图45

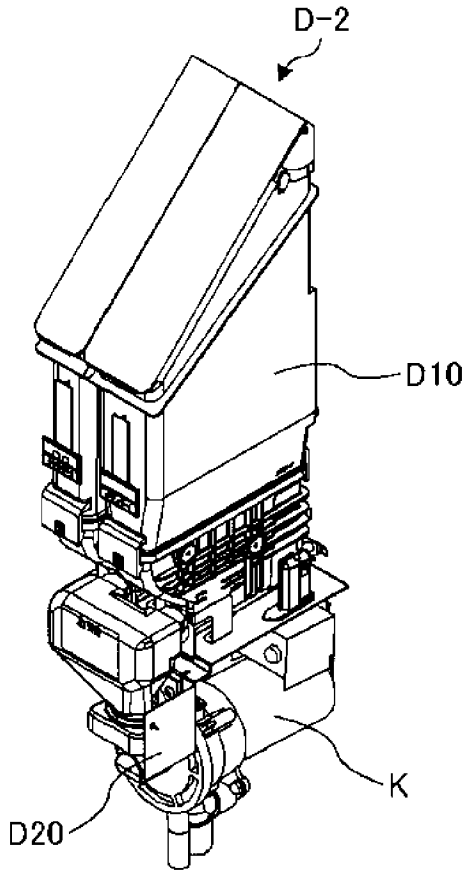


图46

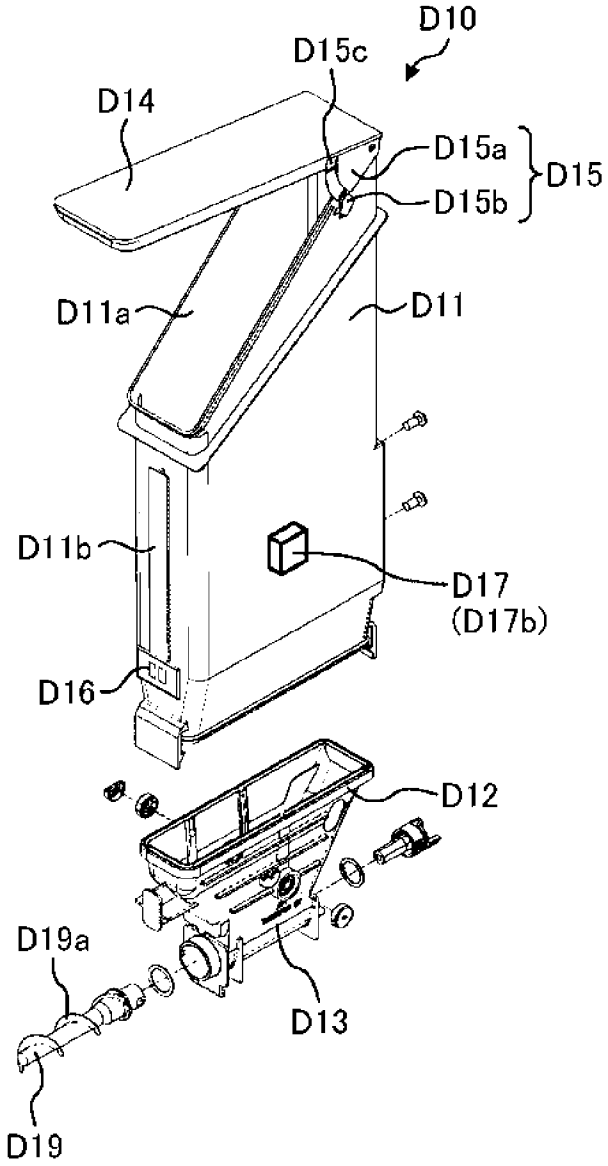


图47

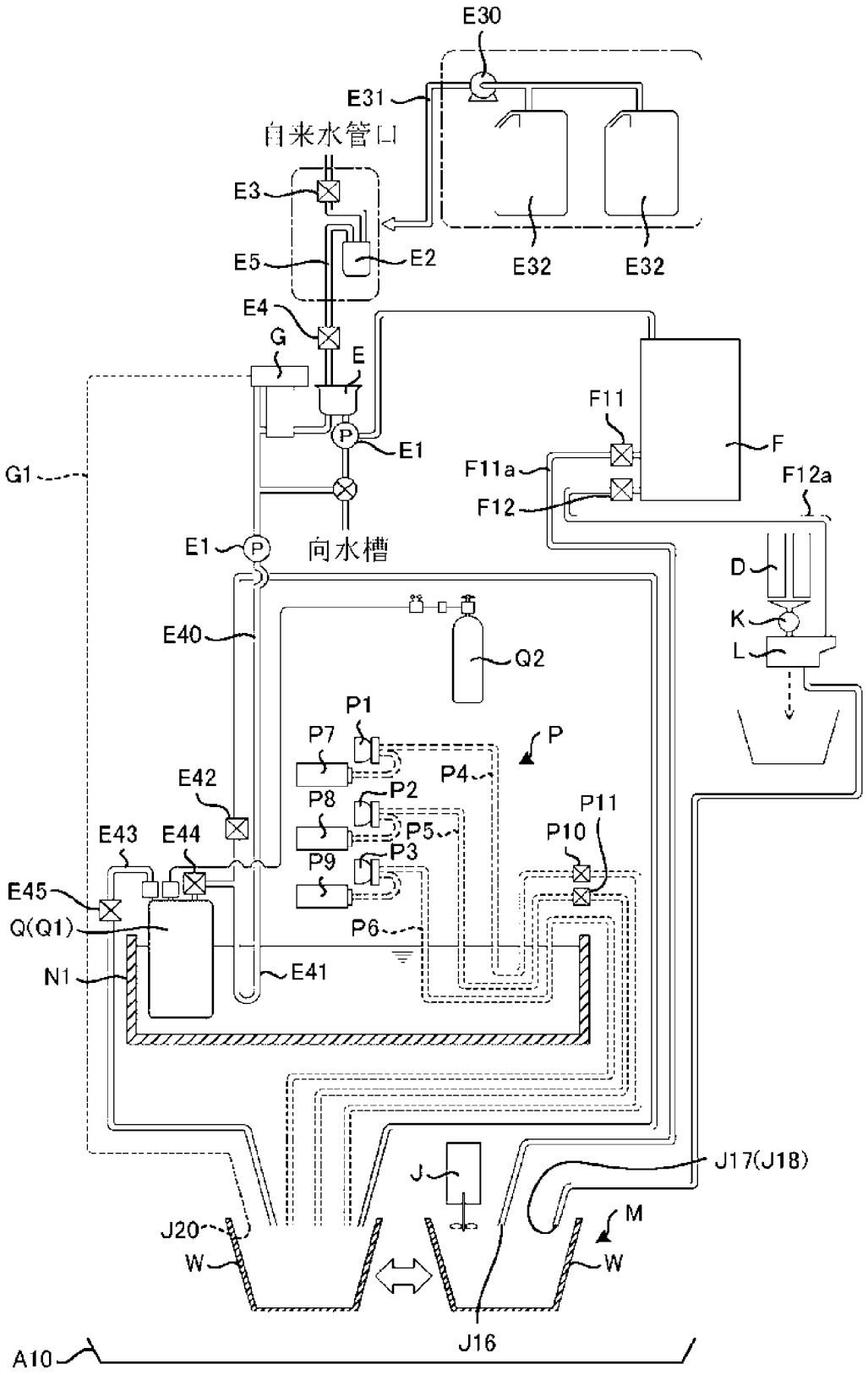


图48

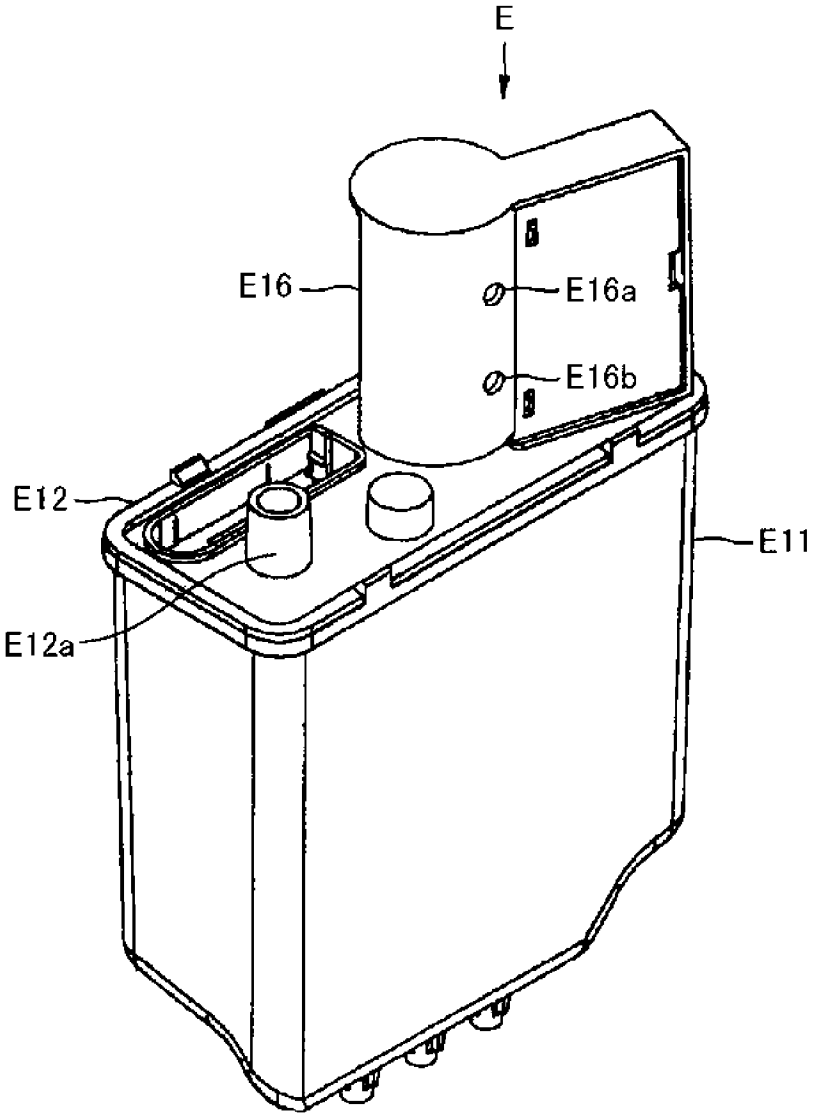


图49

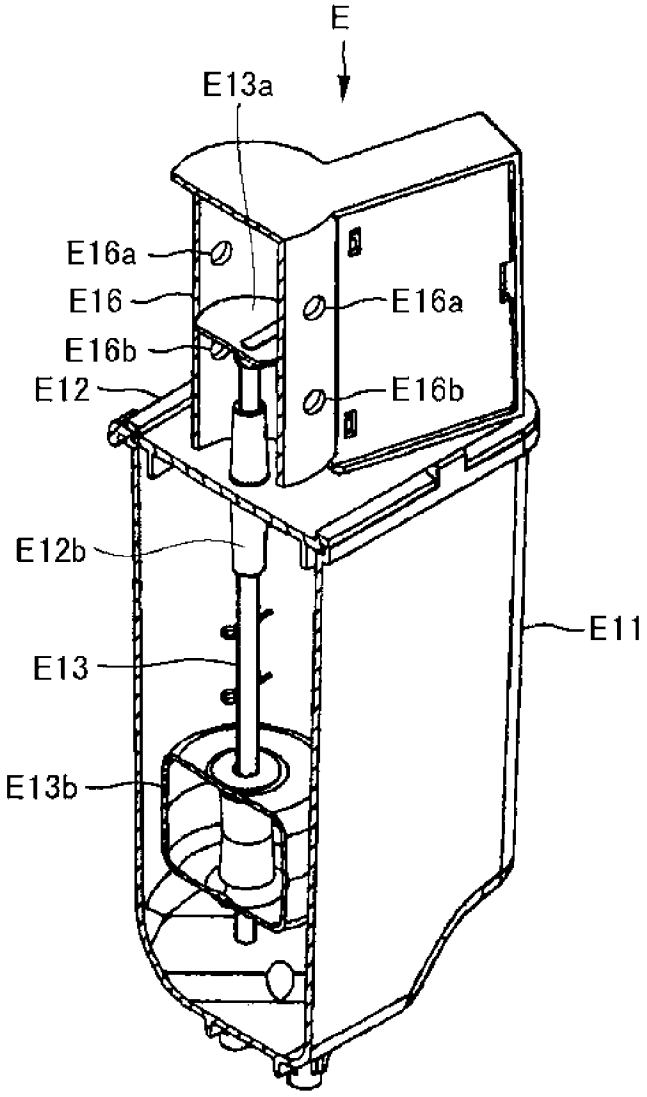


图50

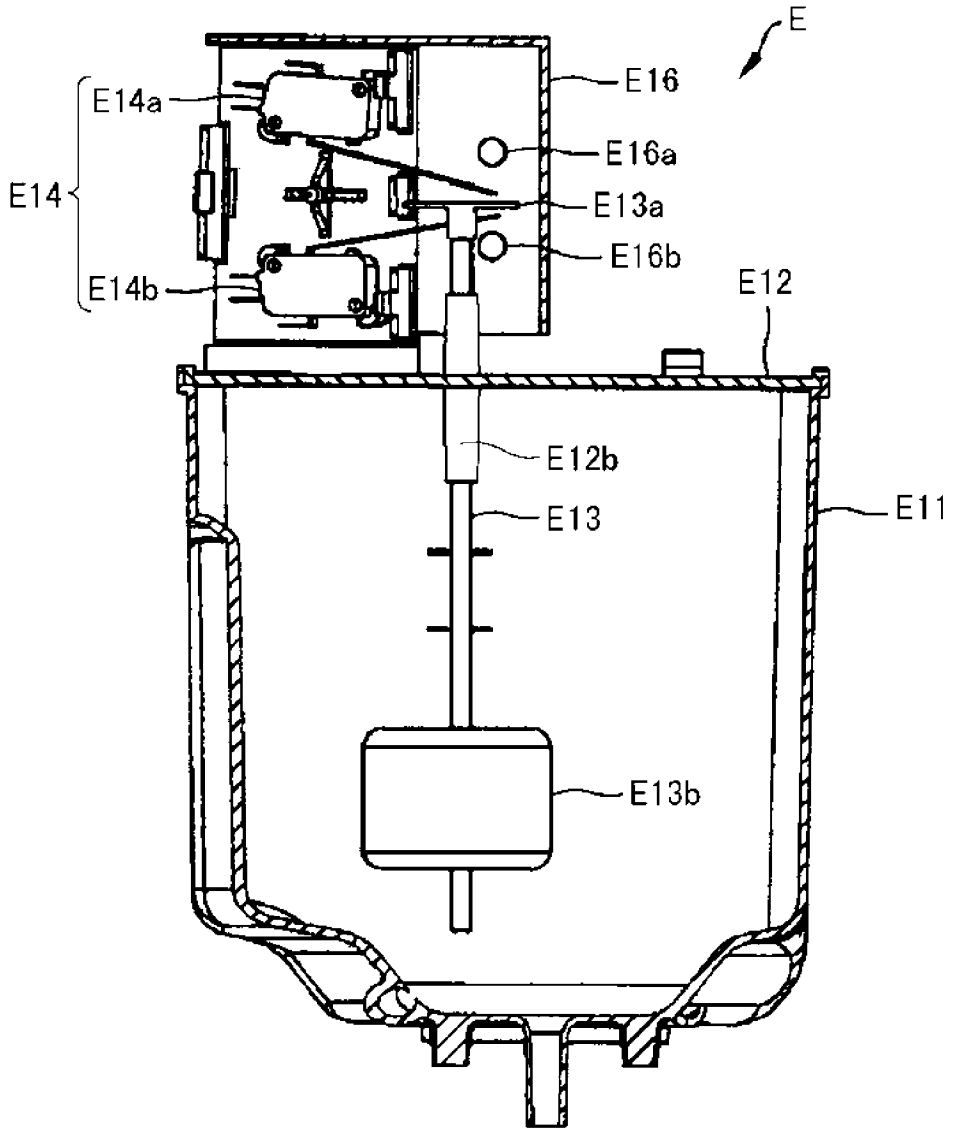


图51

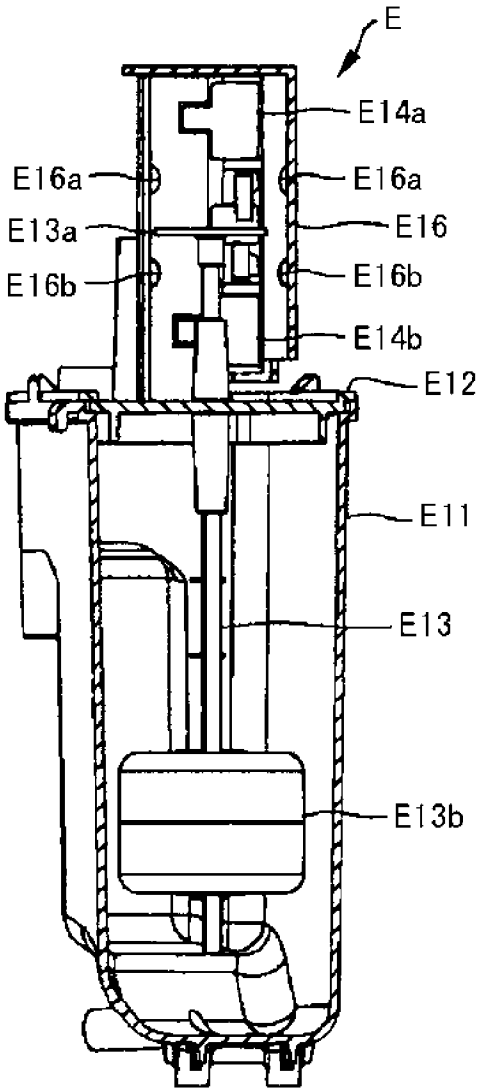


图52

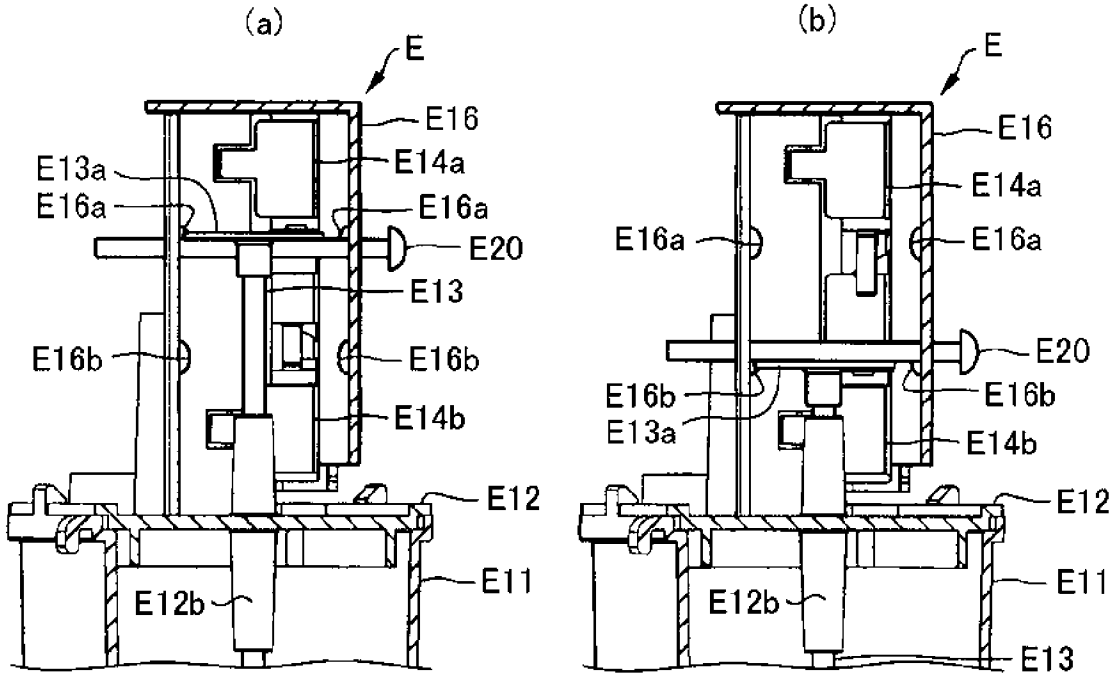


图53

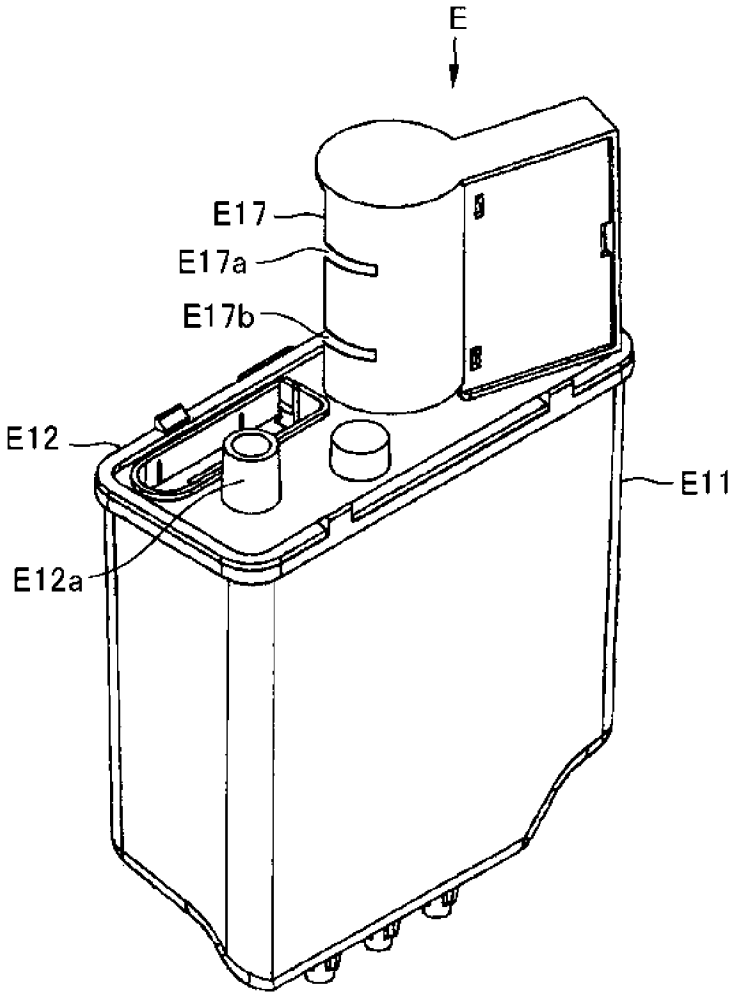


图54

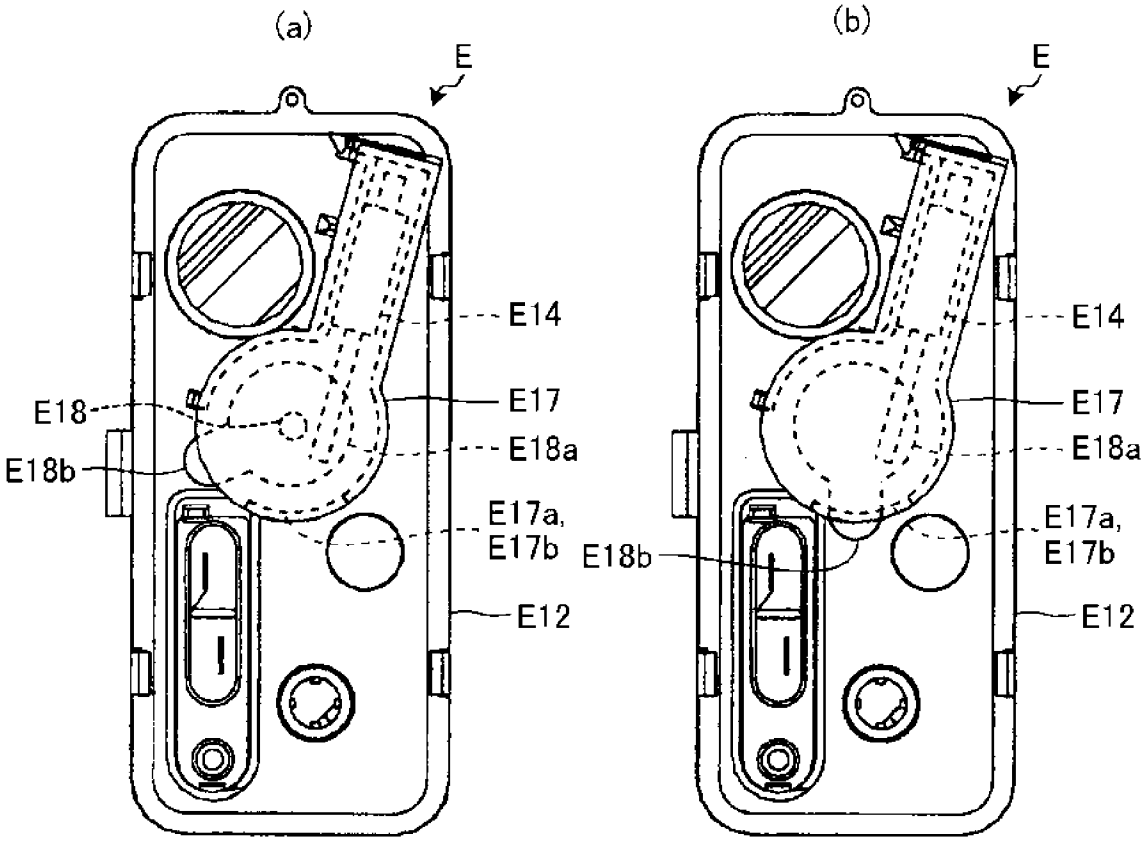


图55

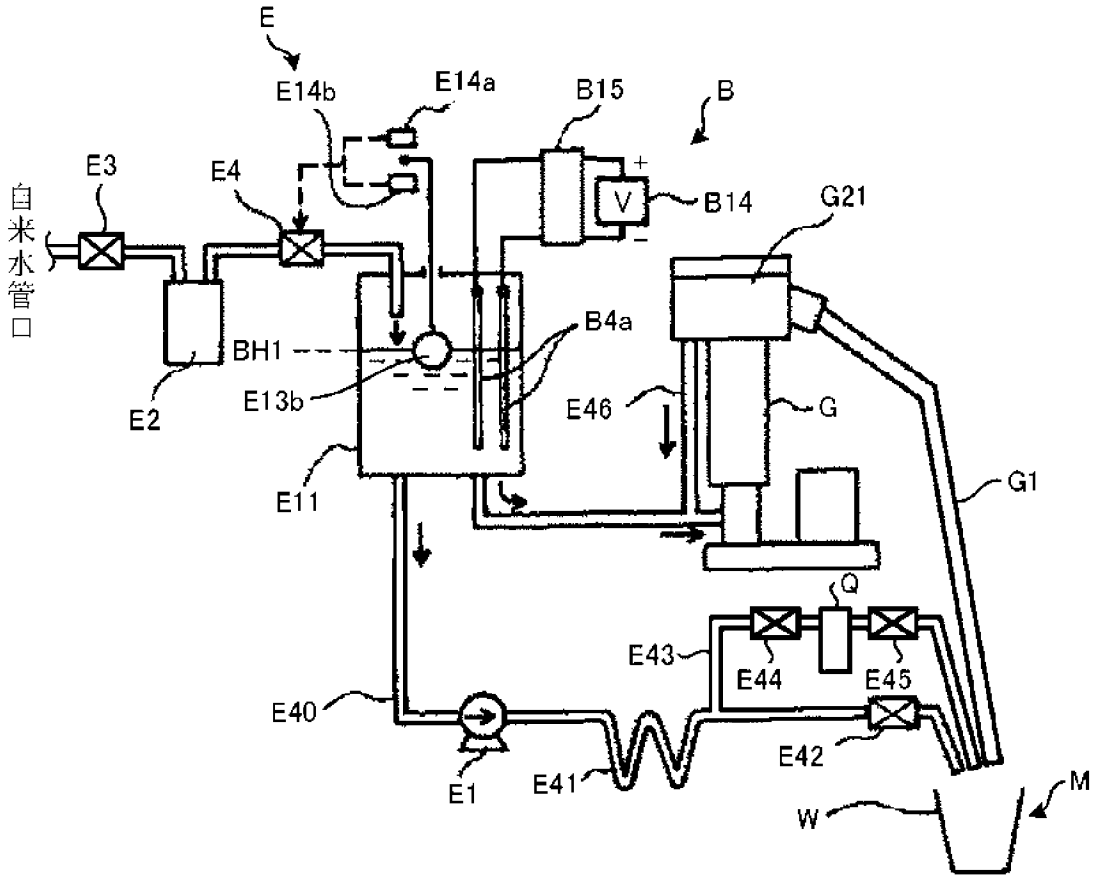


图56

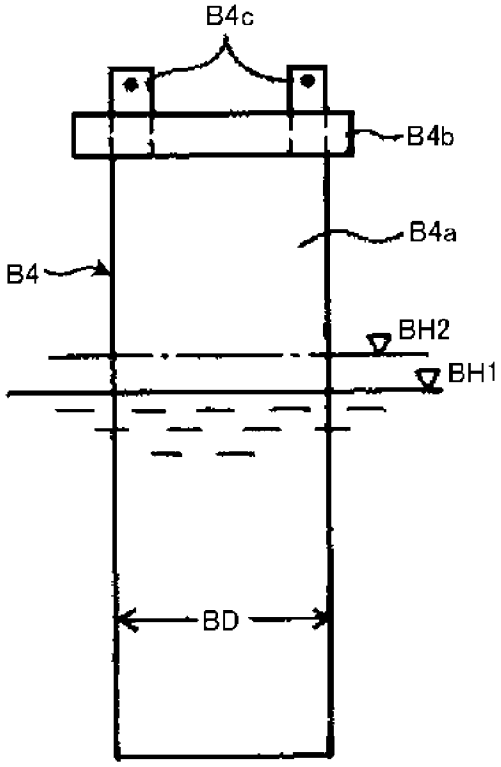


图57

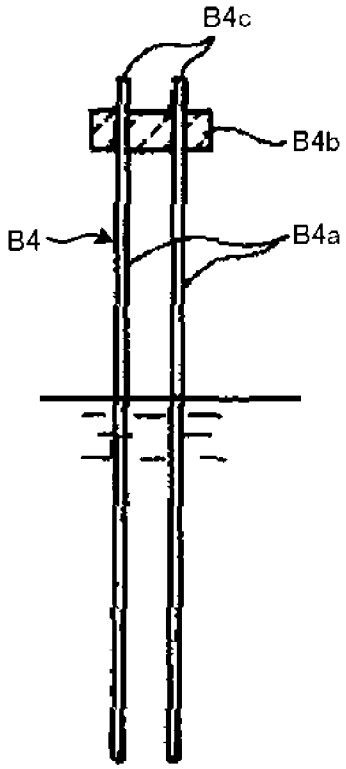


图58

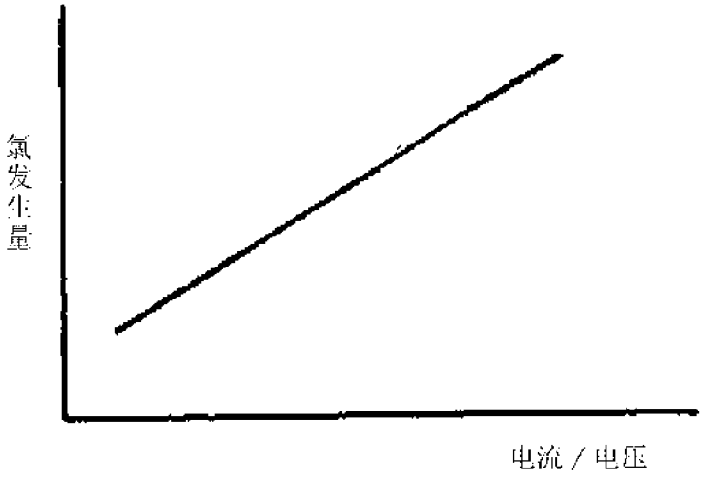


图59

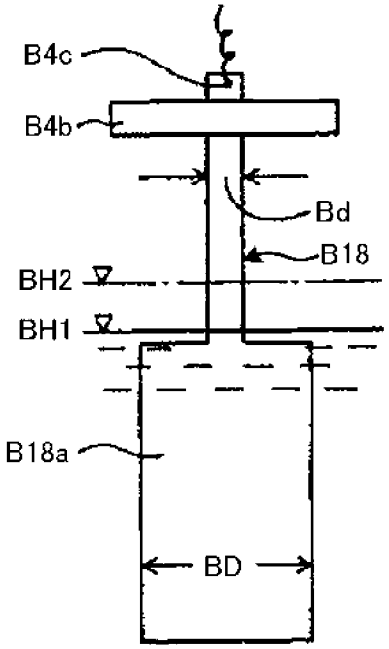


图60

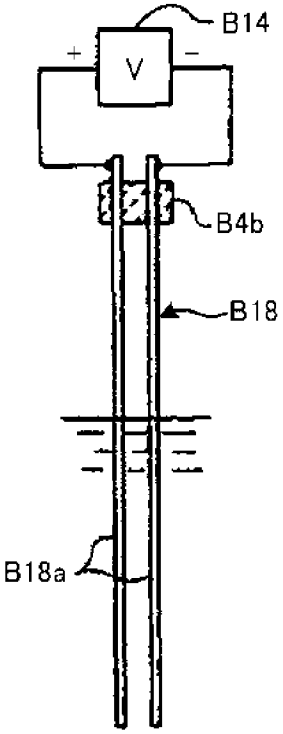


图61

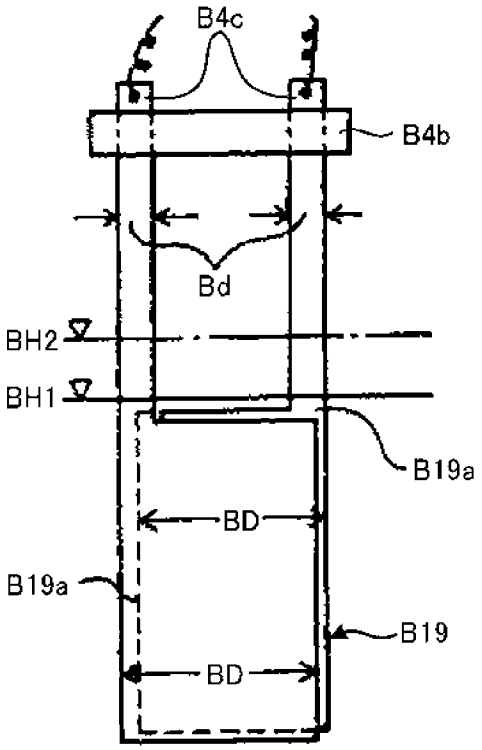


图62

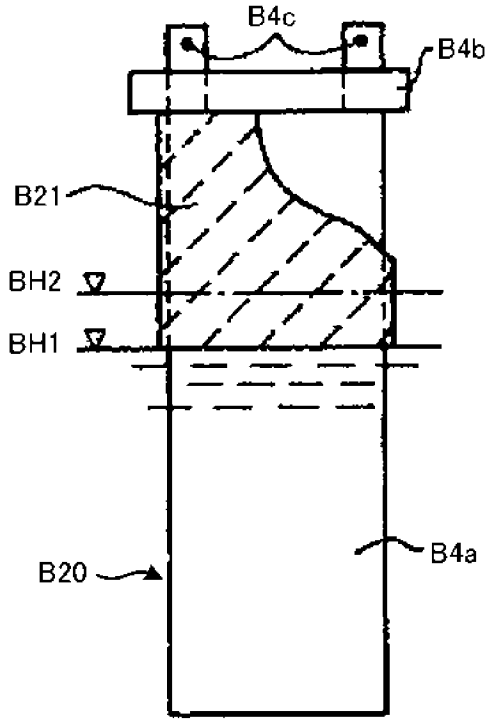


图63

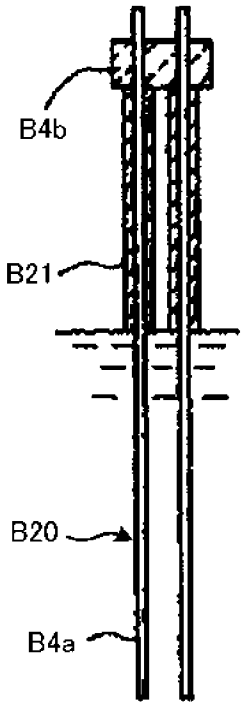


图64

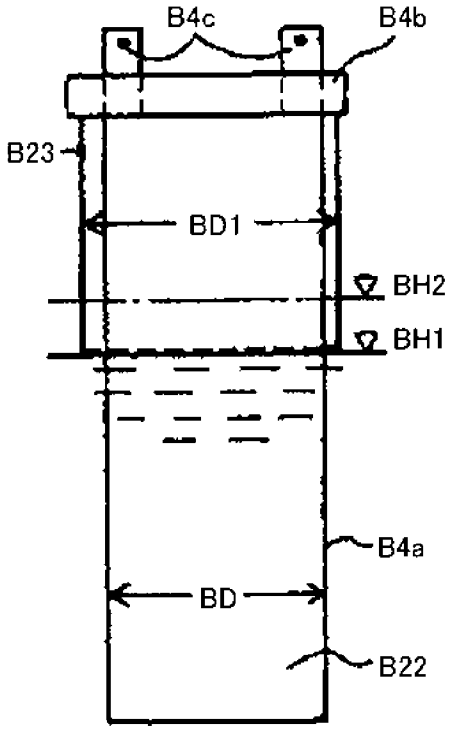


图65

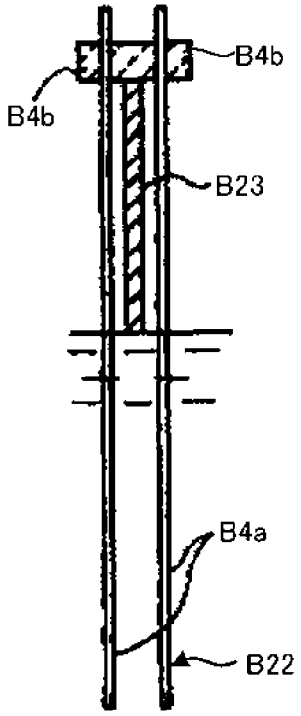


图66

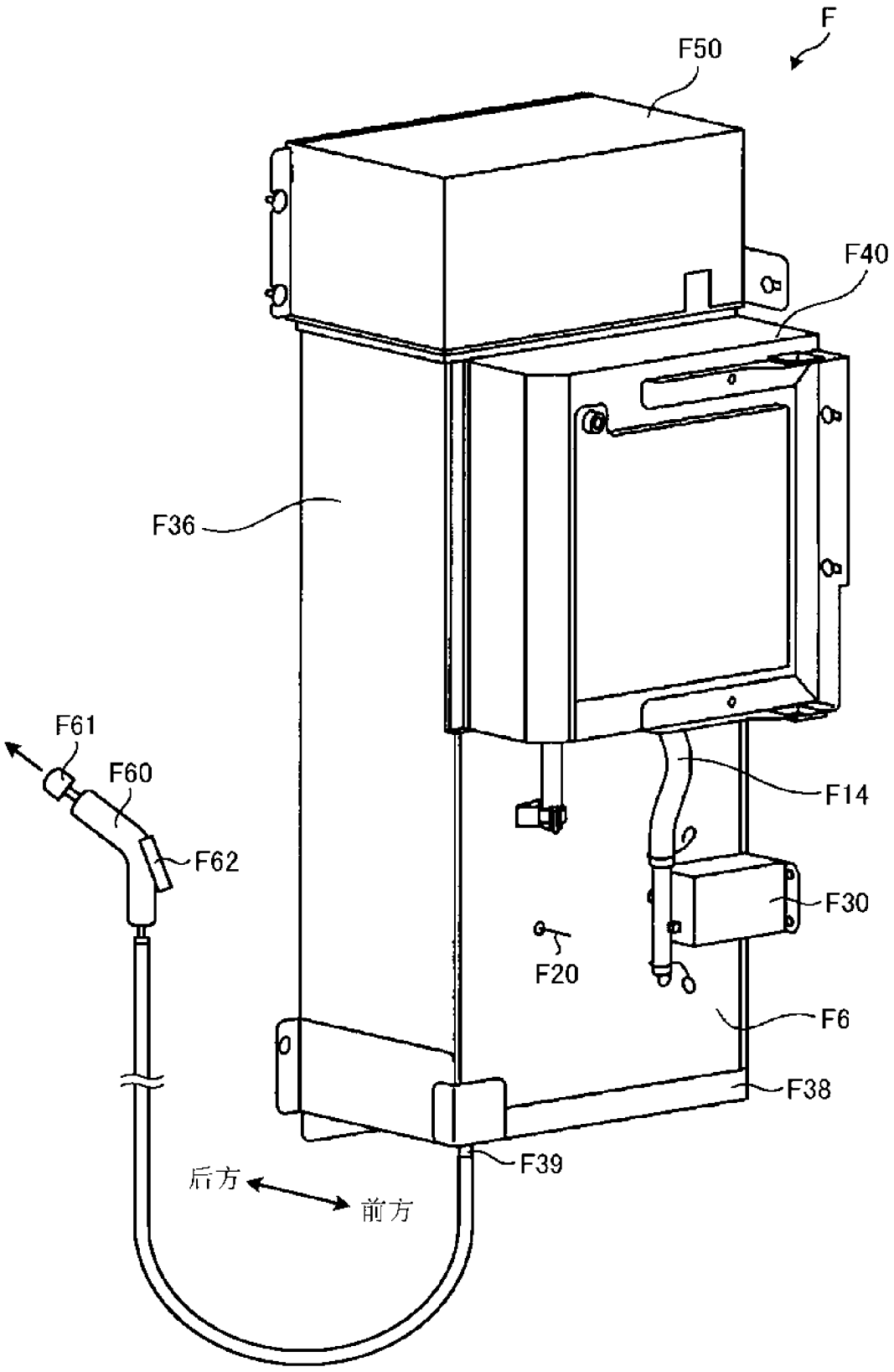


图67

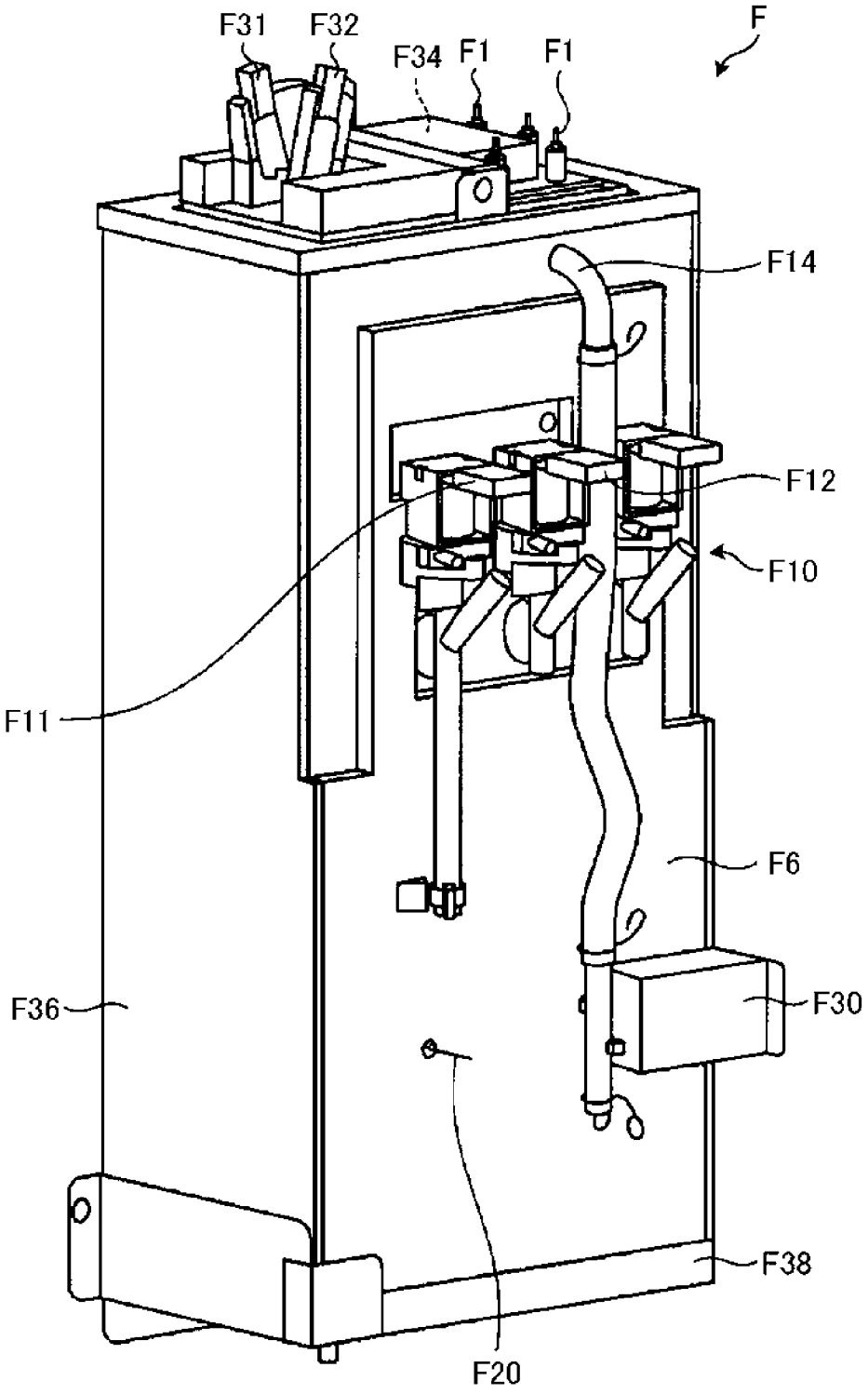


图68

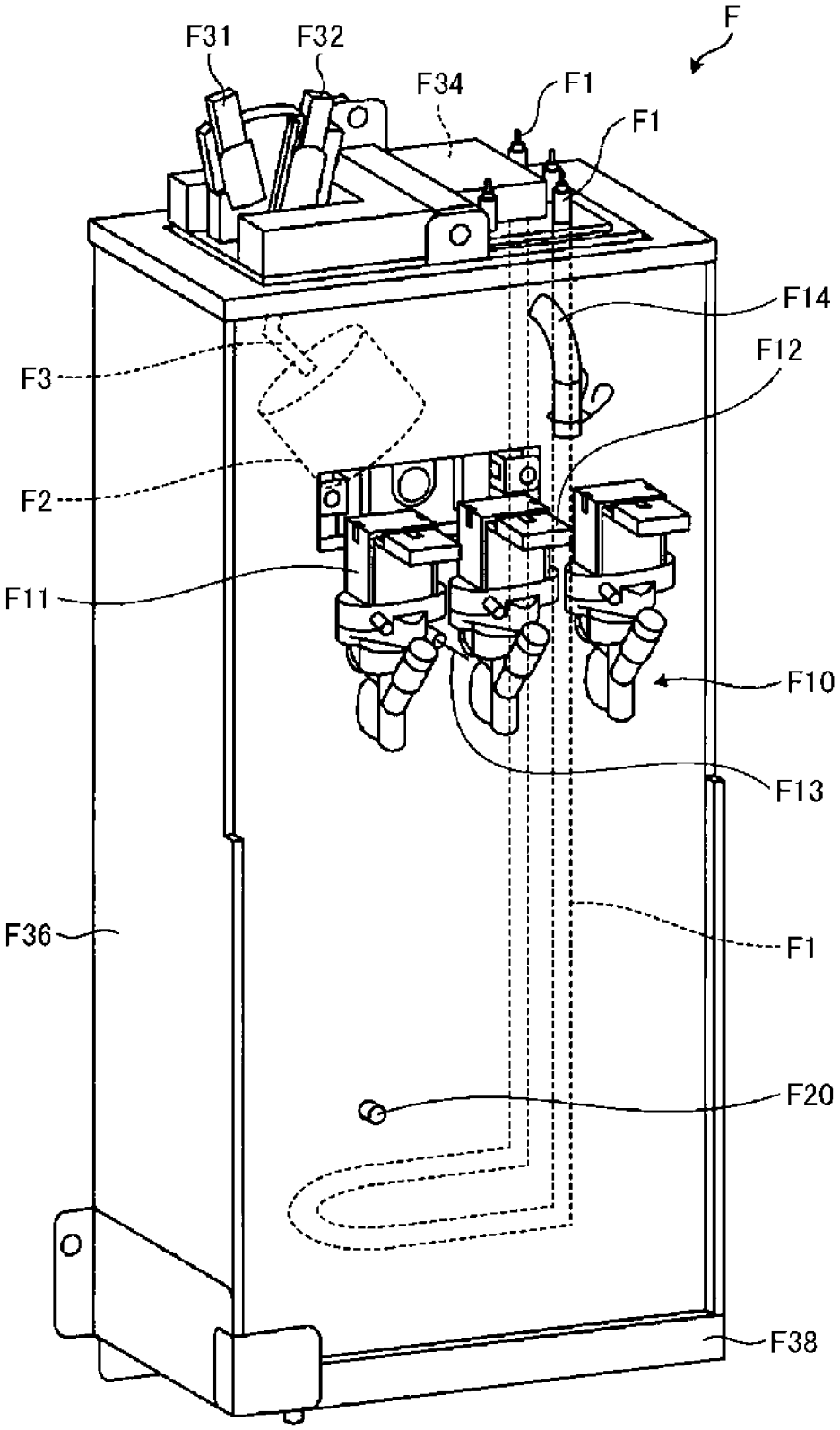


图69

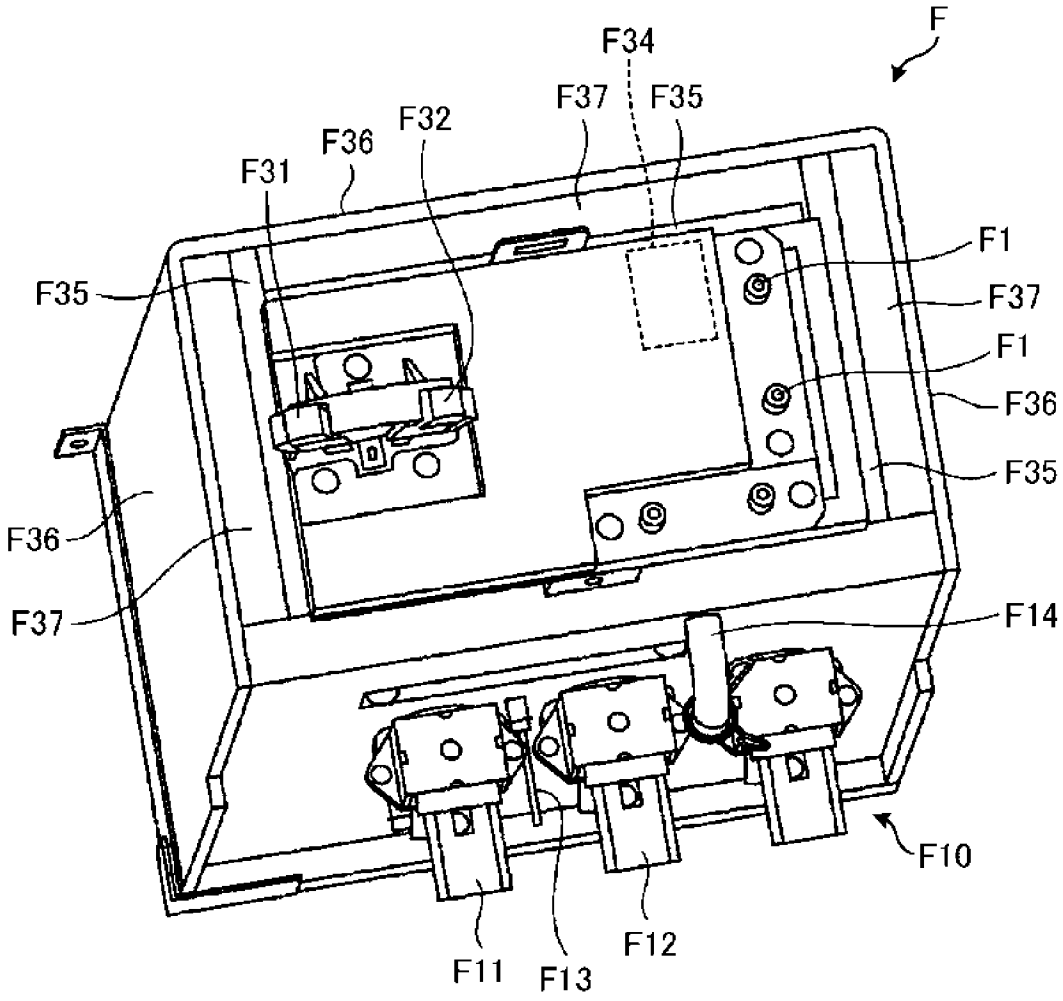


图70

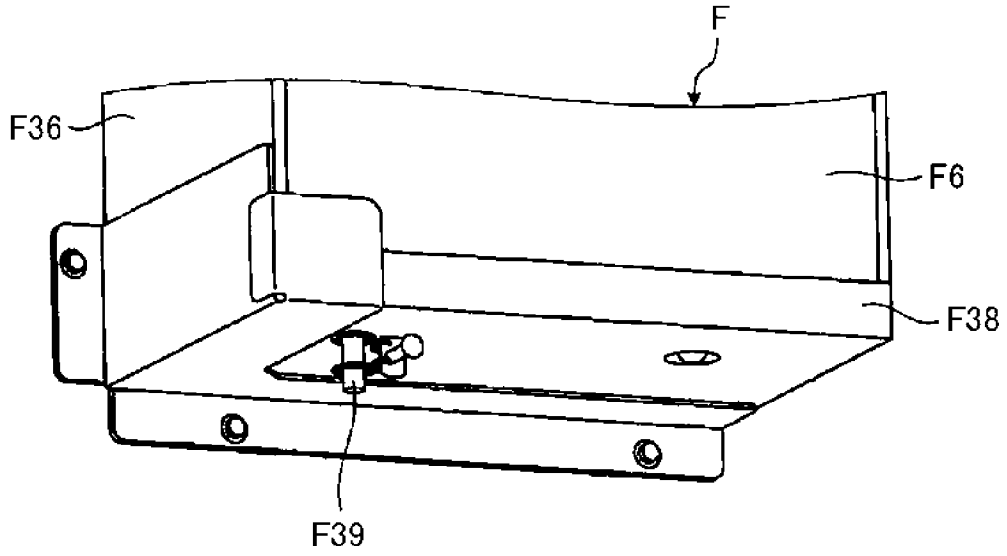


图71

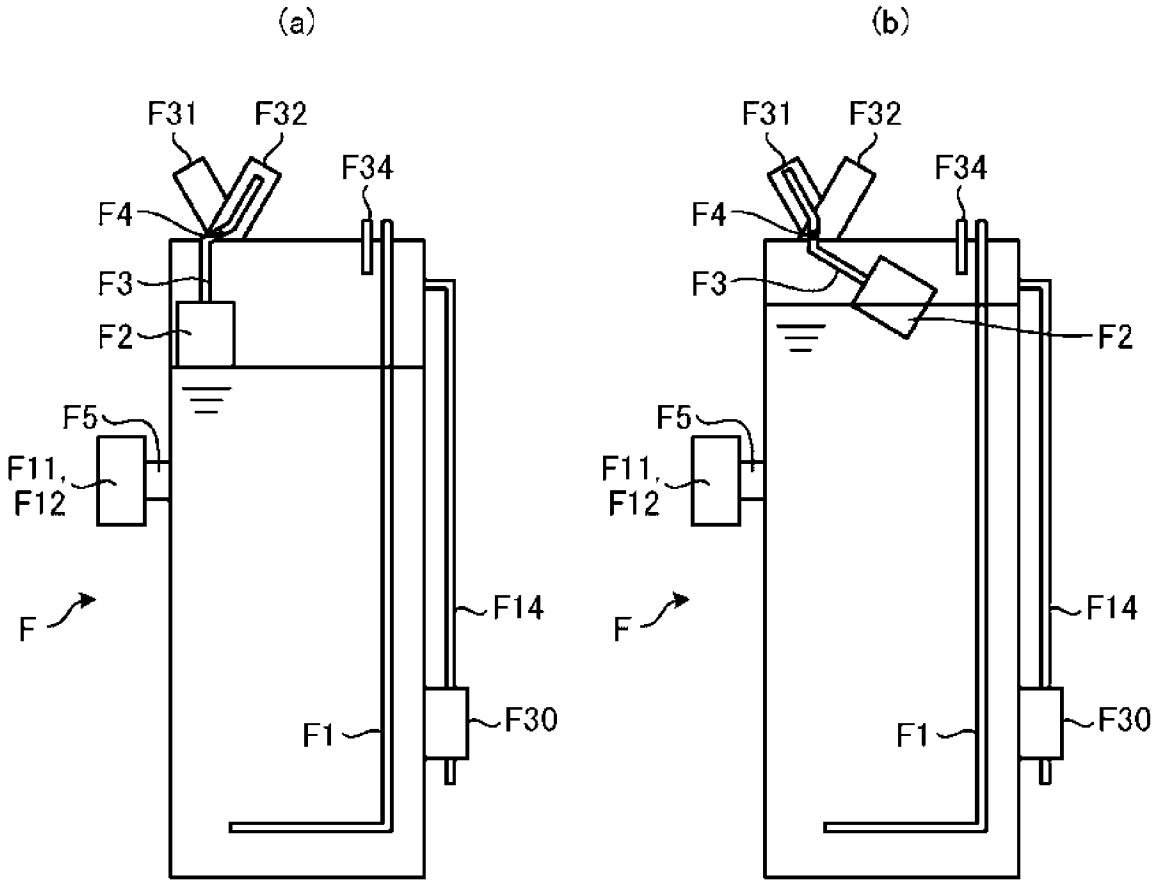


图72

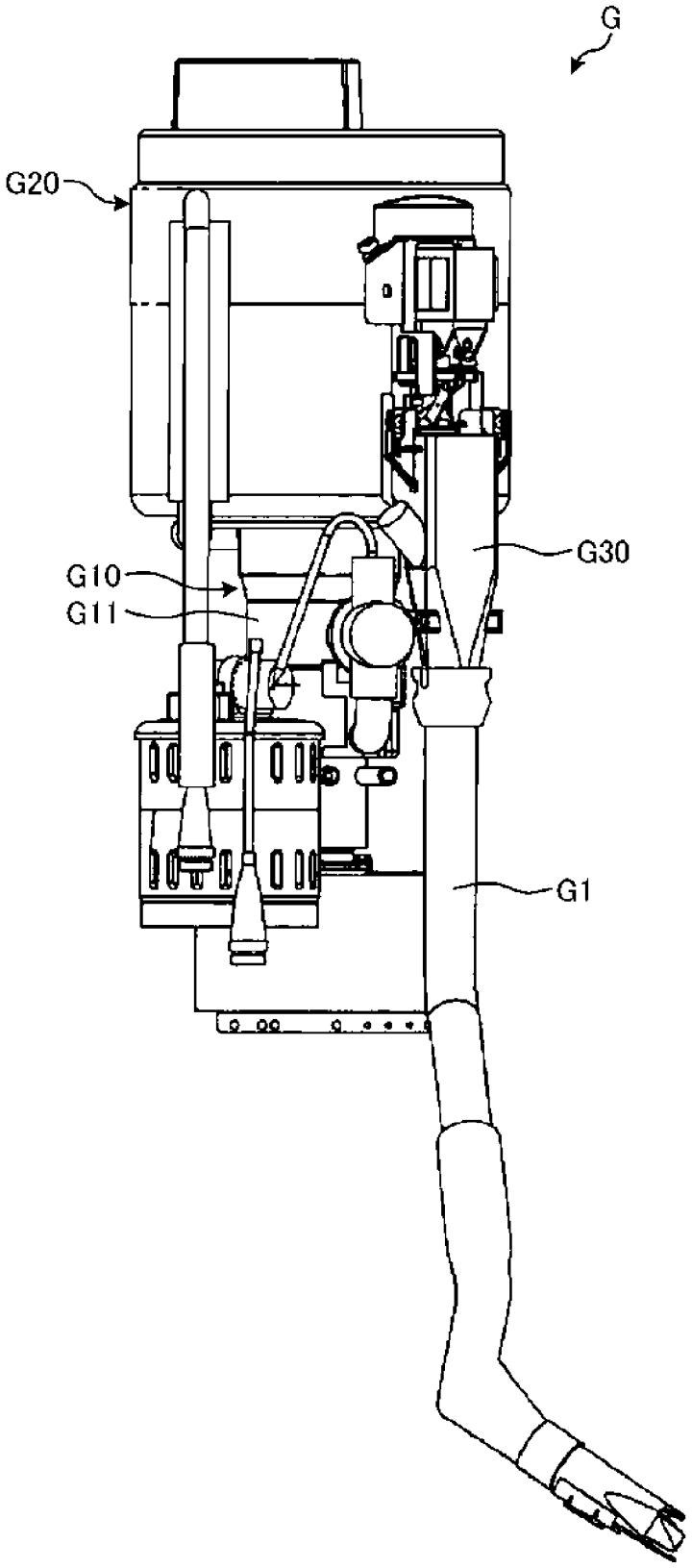


图73

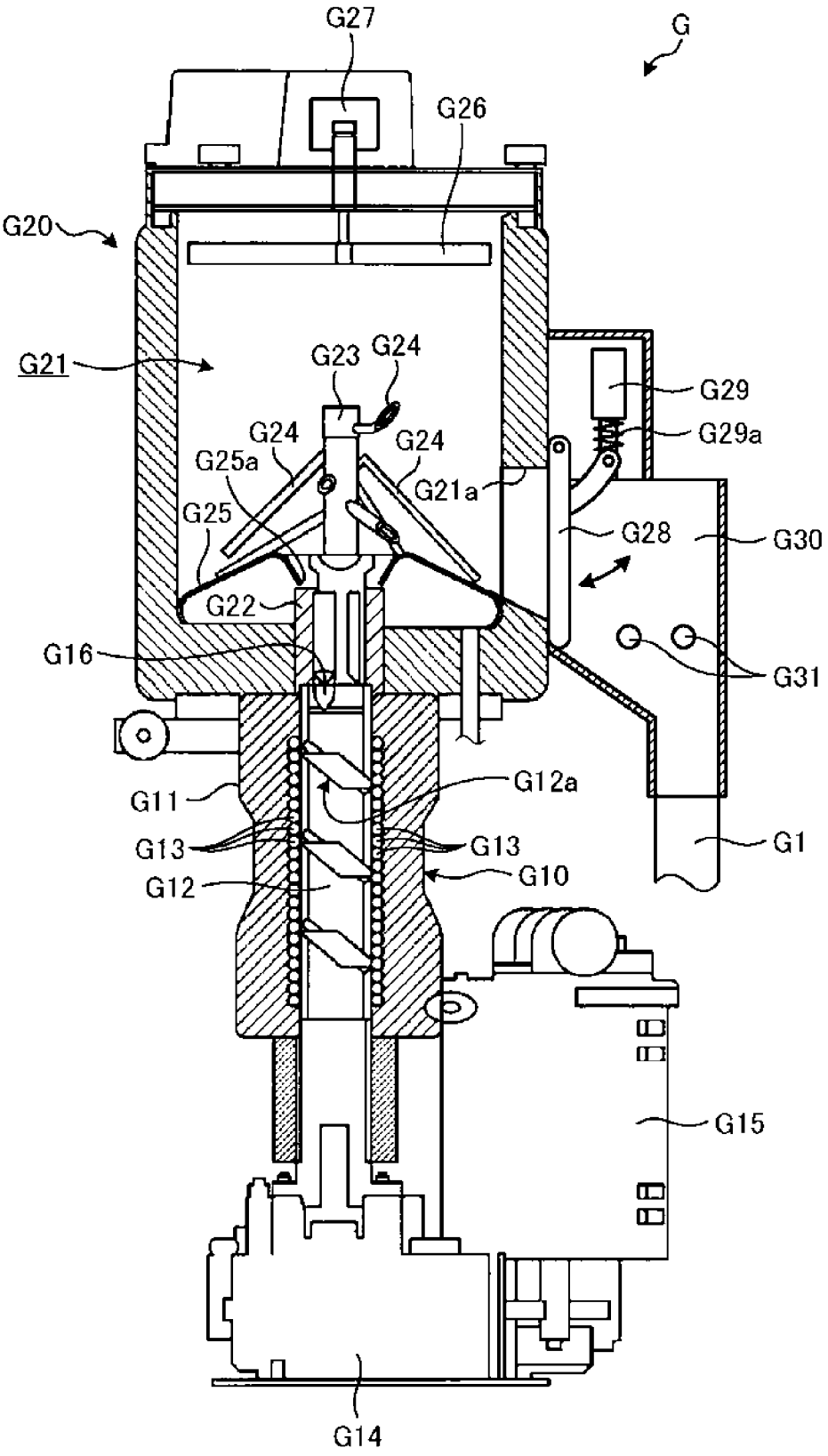


图74

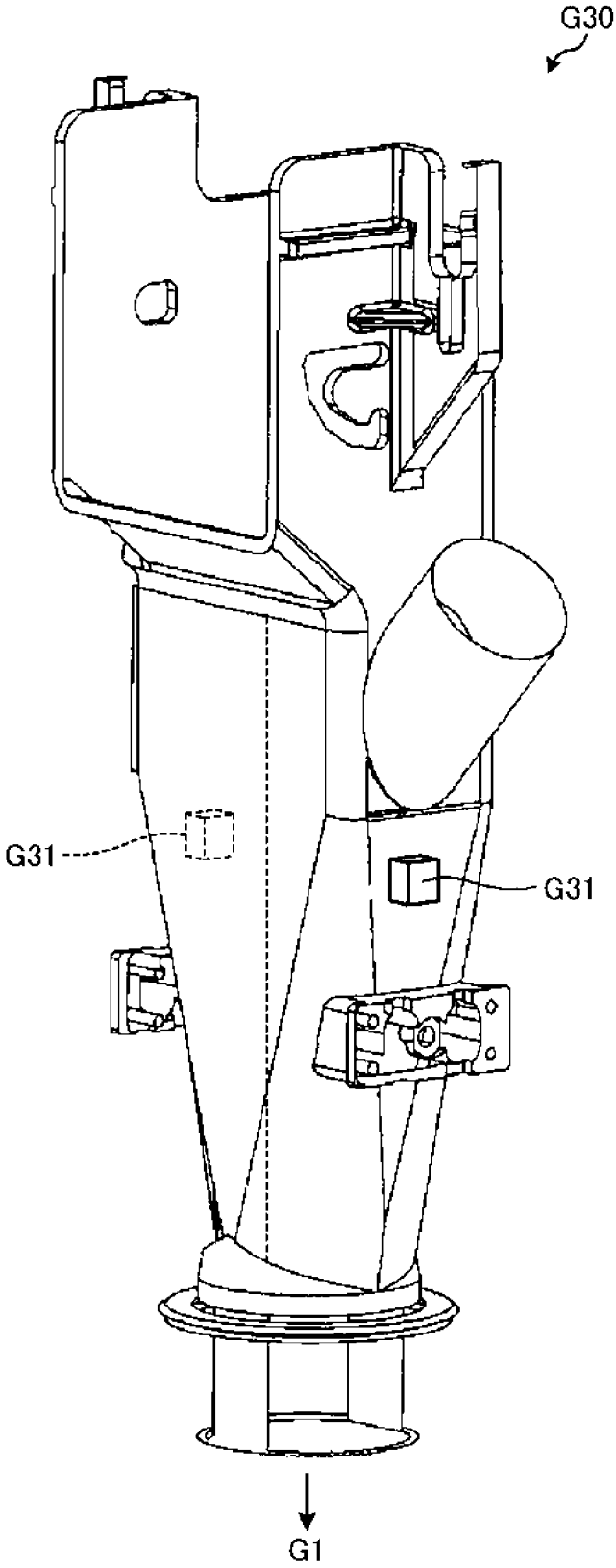


图75

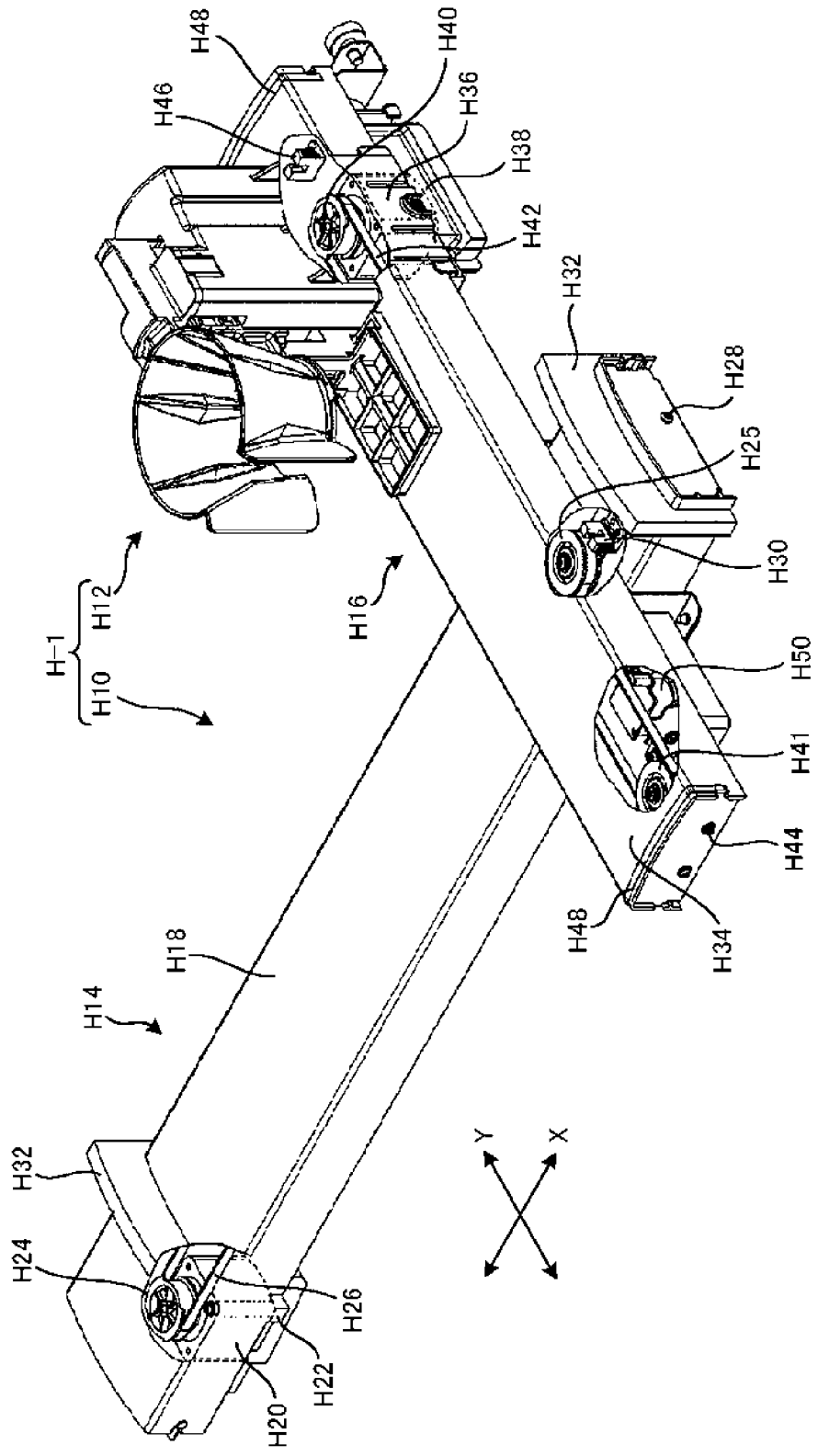


图76

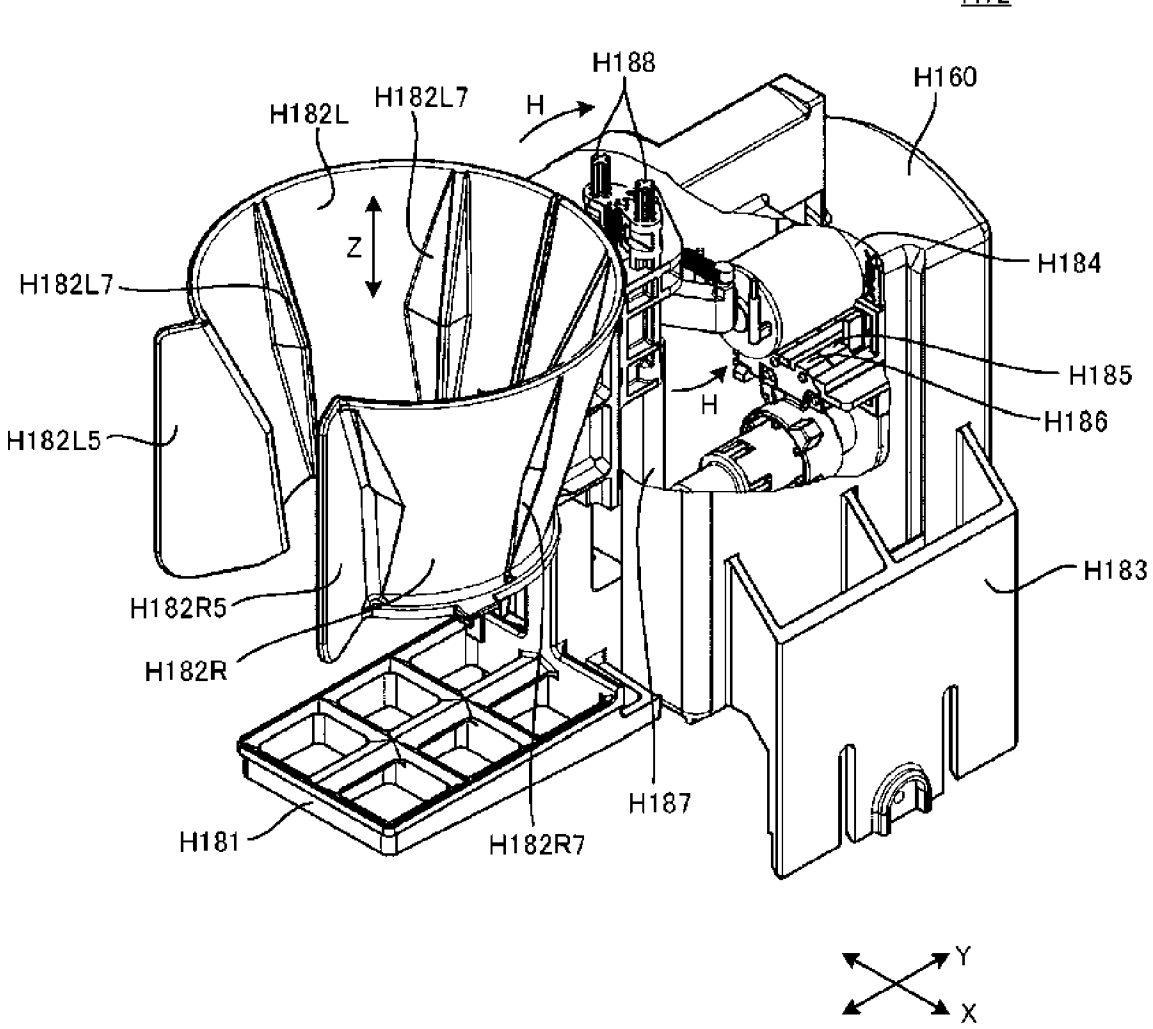


图77

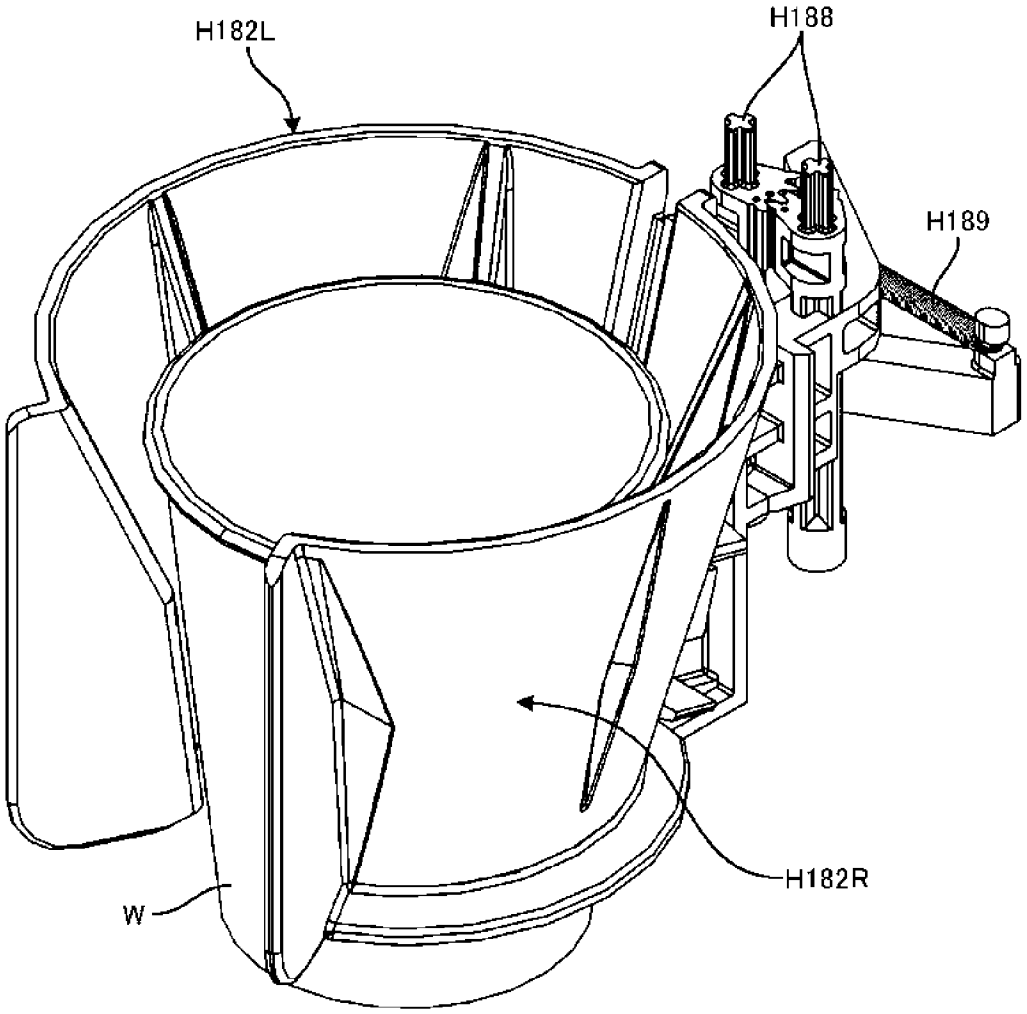


图78

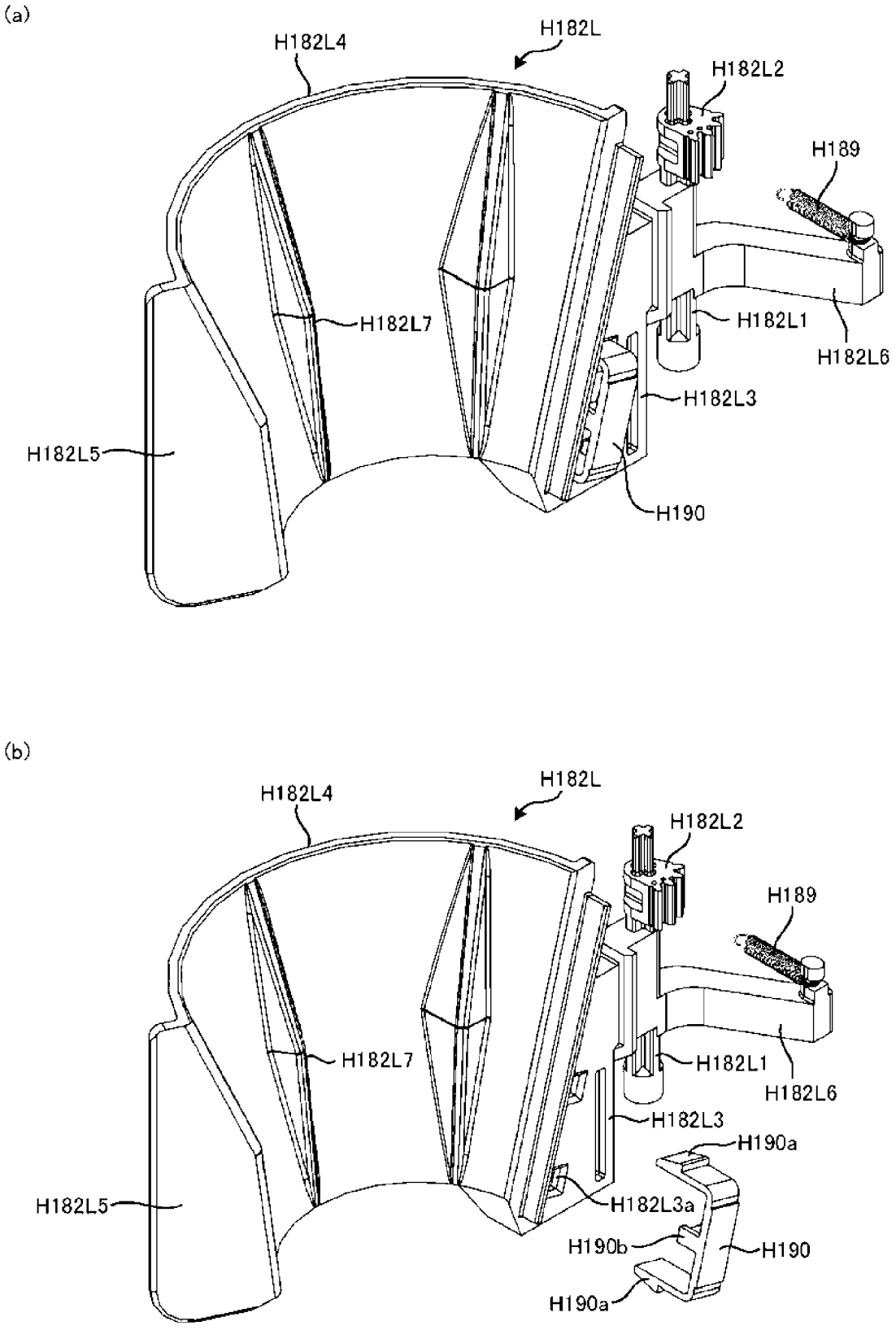


图79

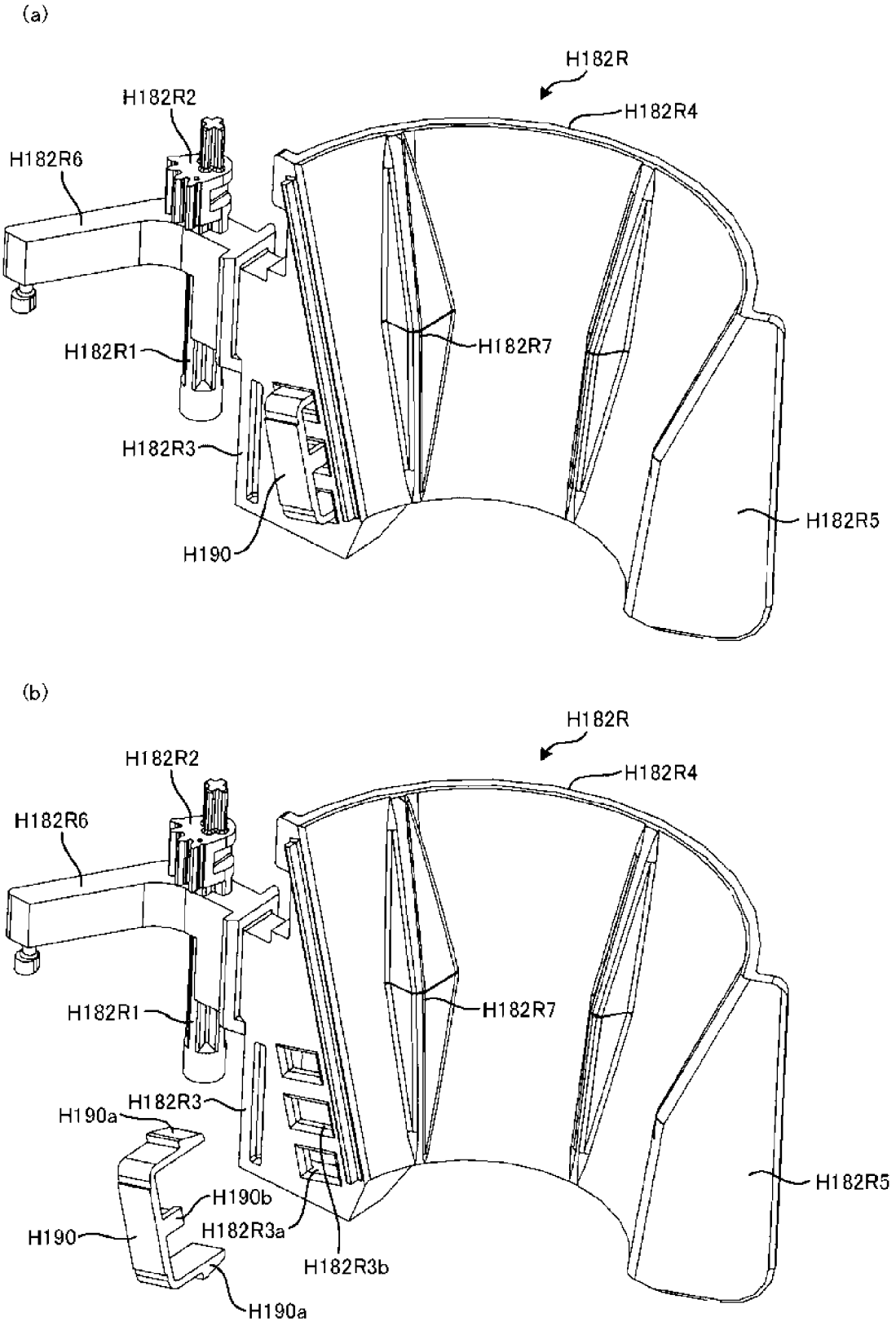


图80

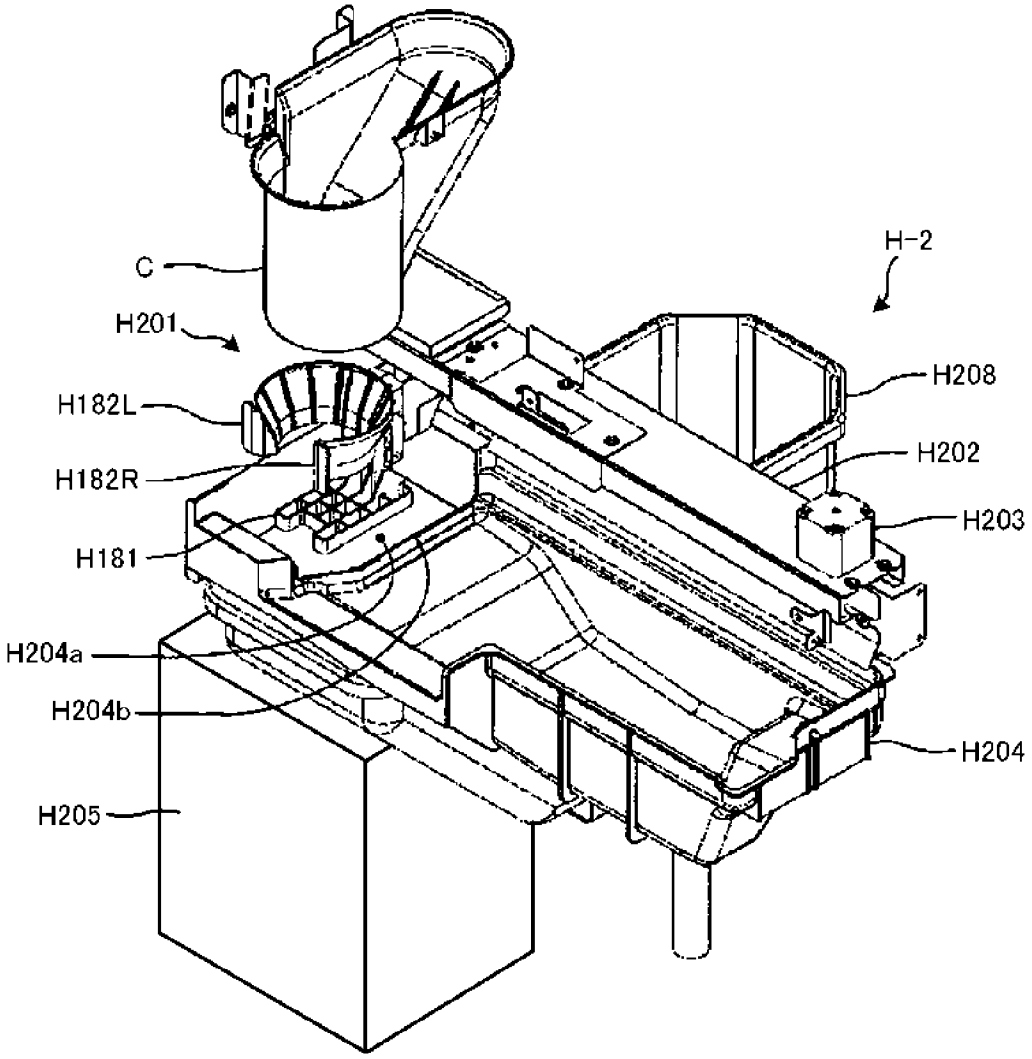


图81

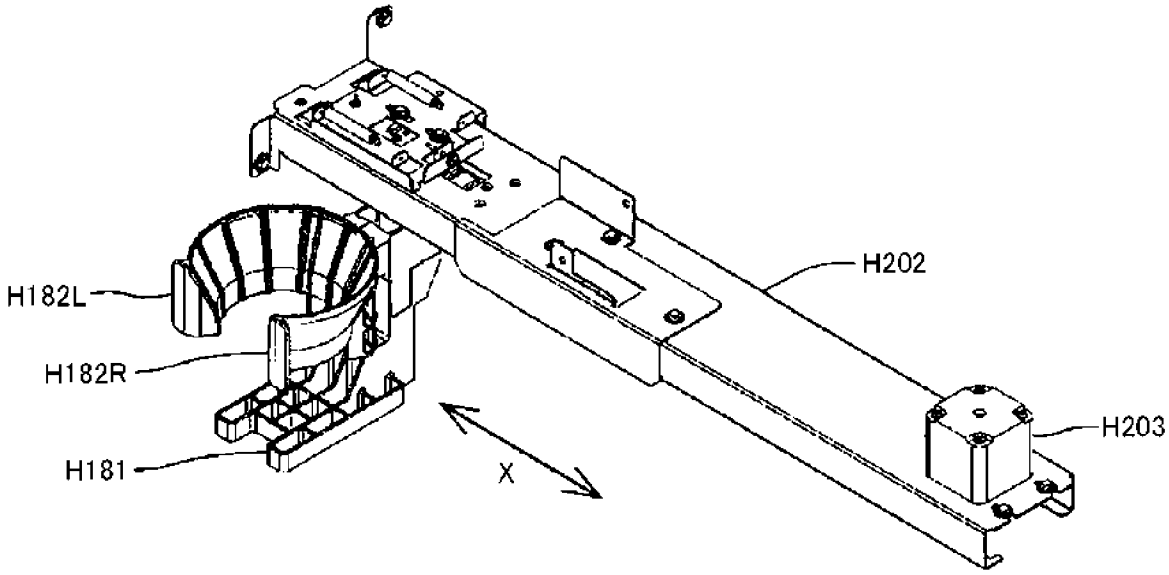


图82

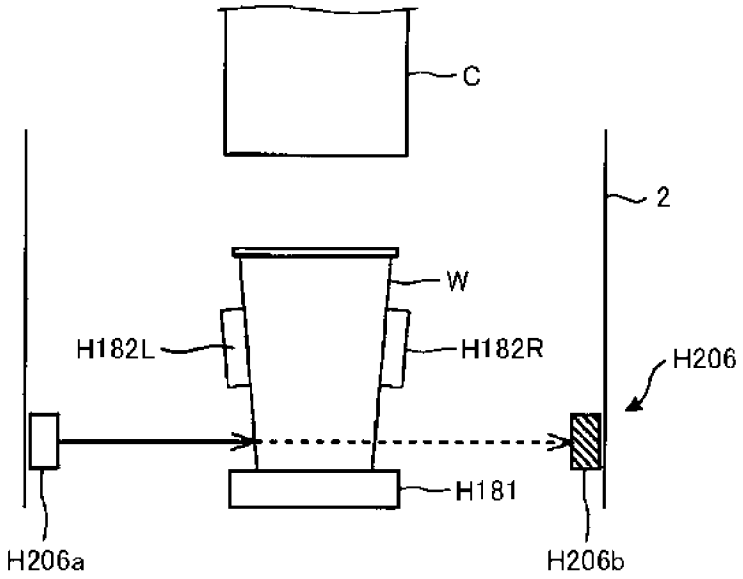


图83

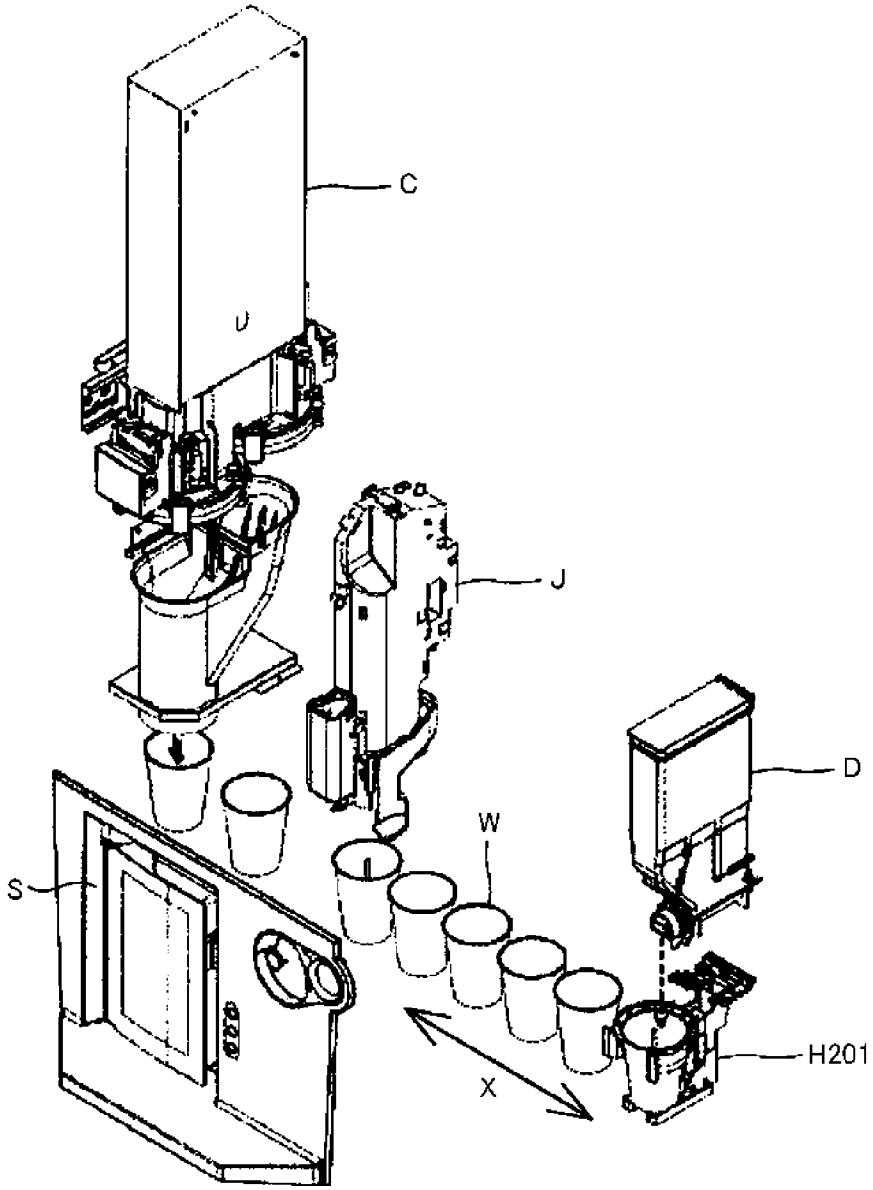


图84

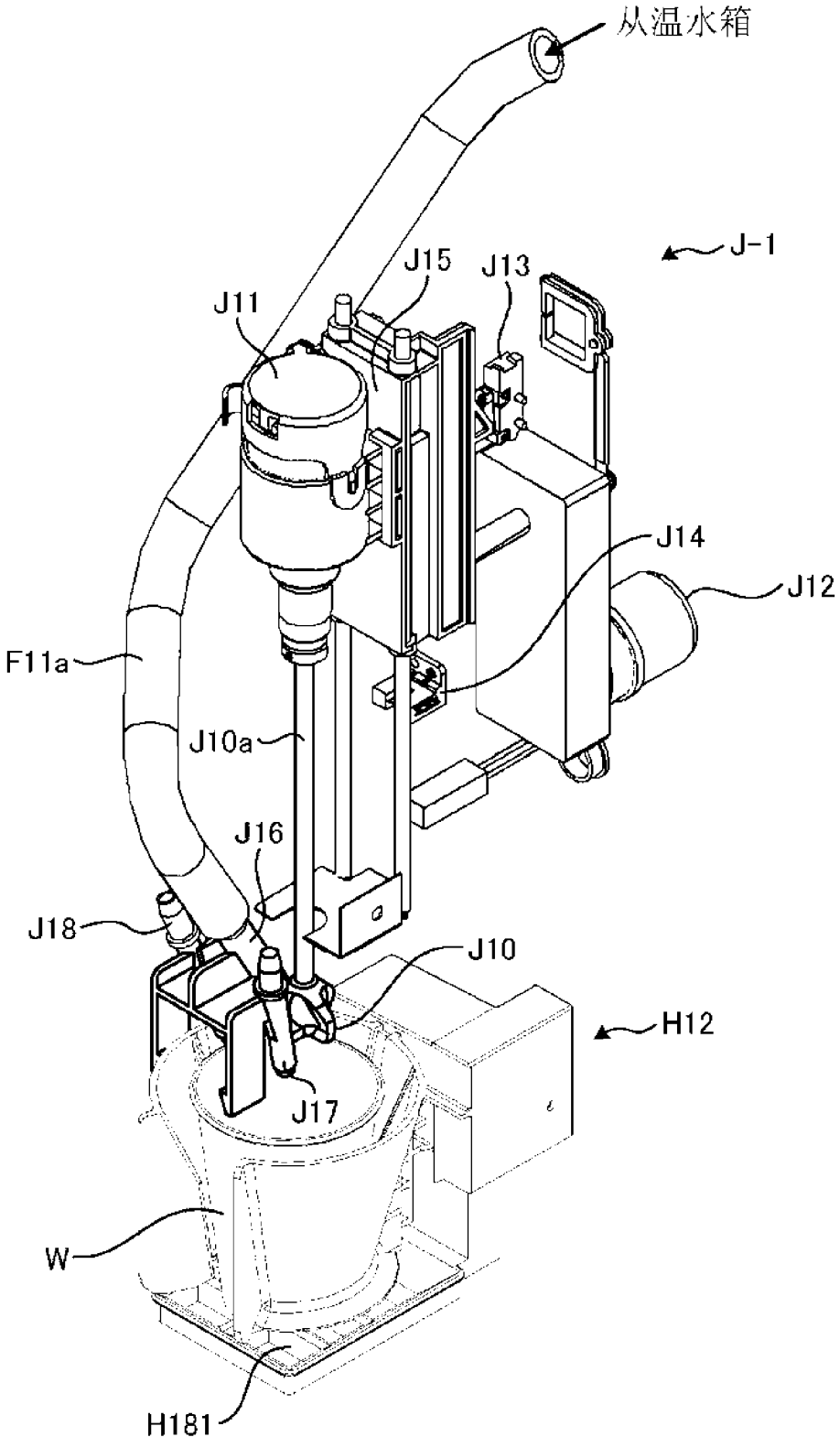


图85

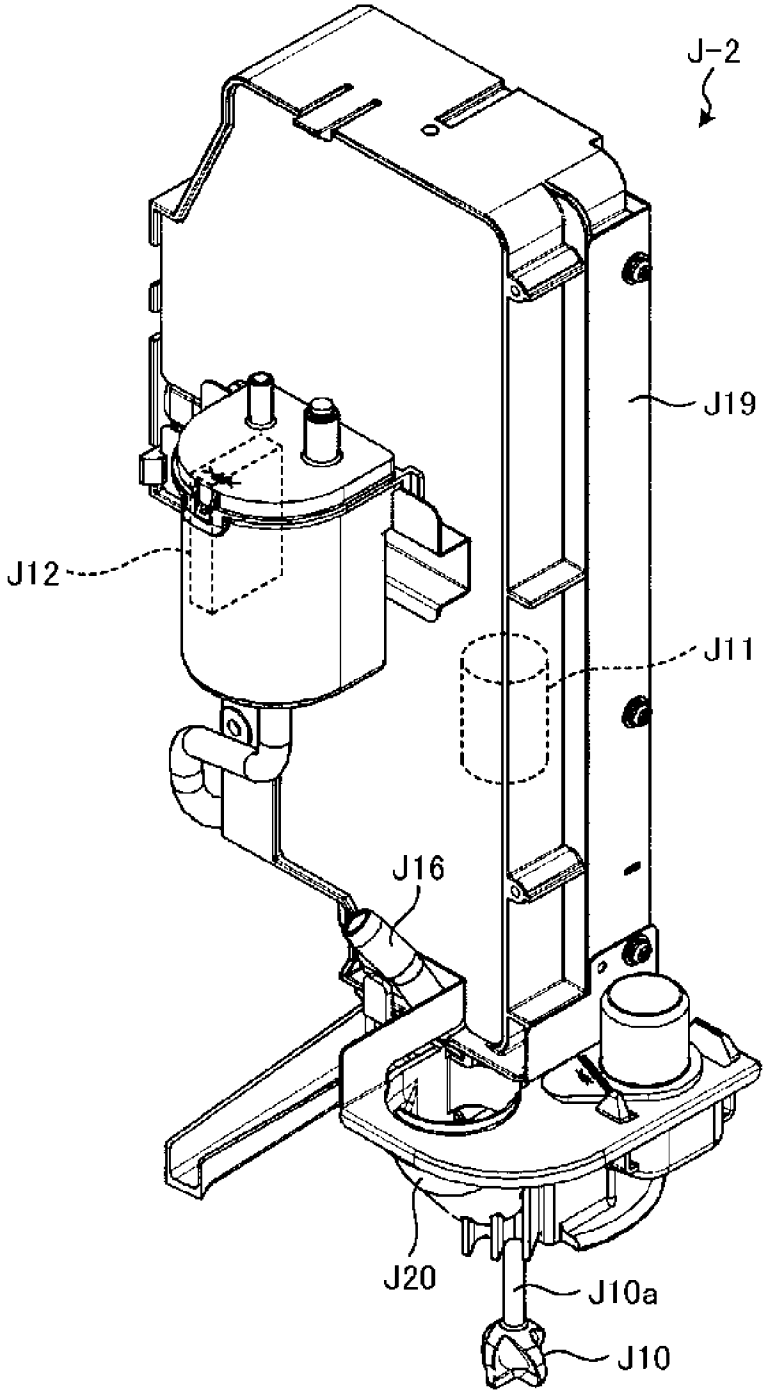


图86

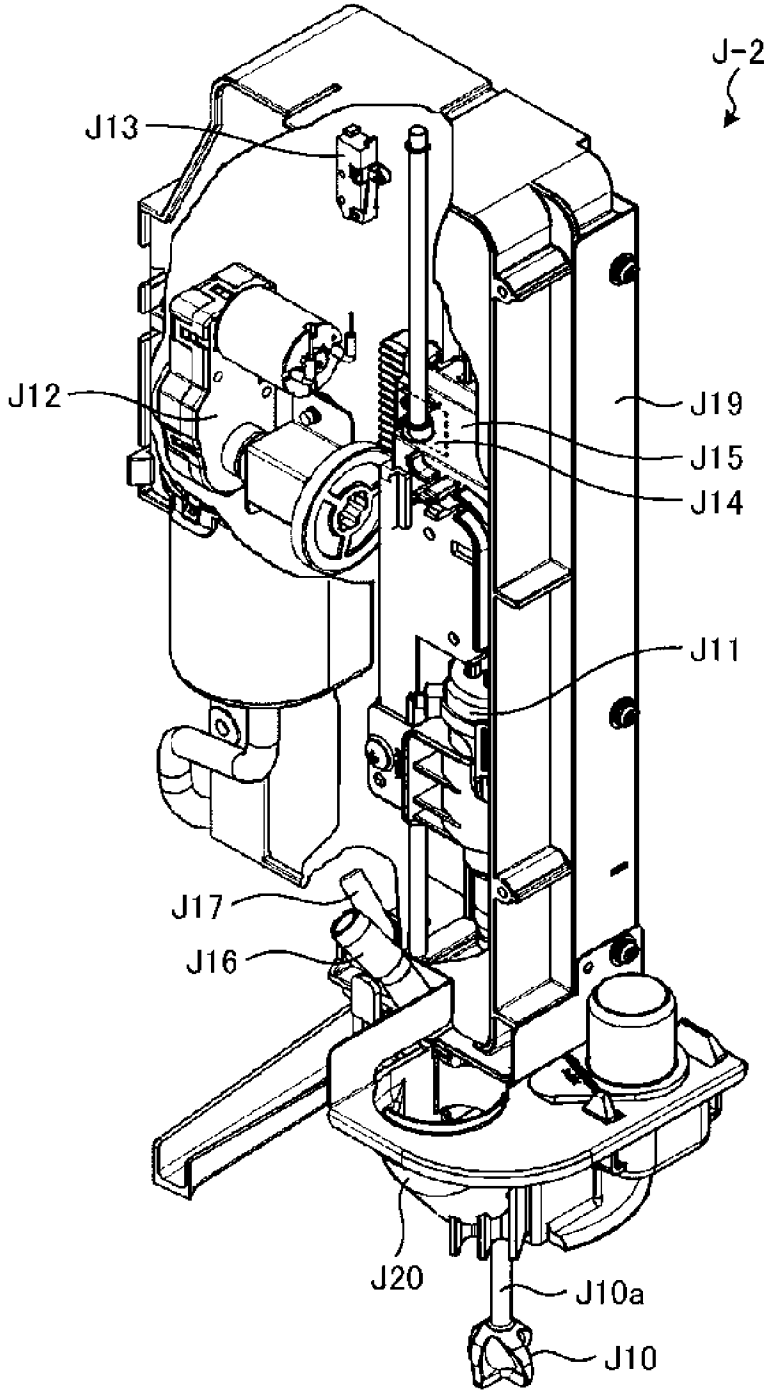


图87

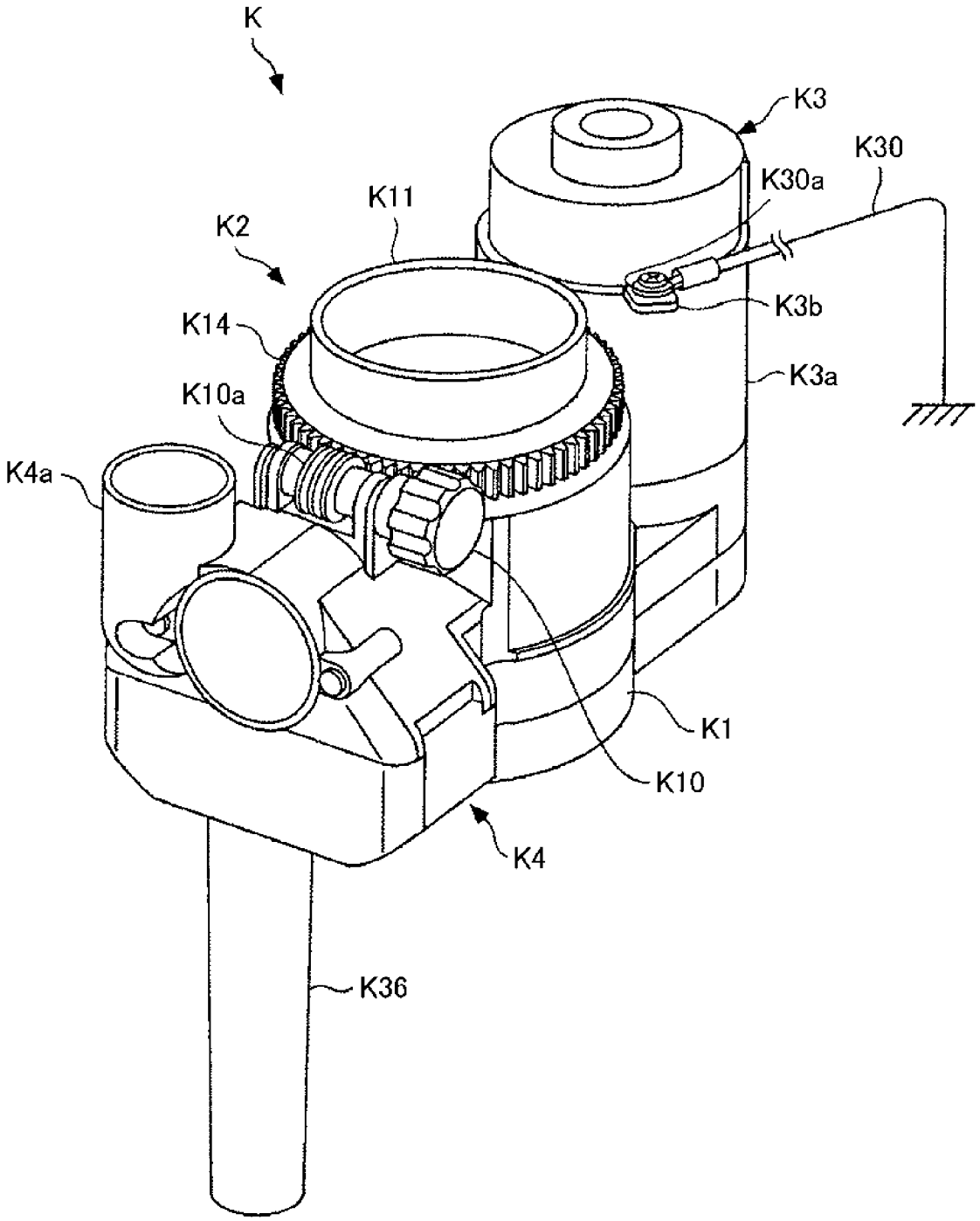


图88

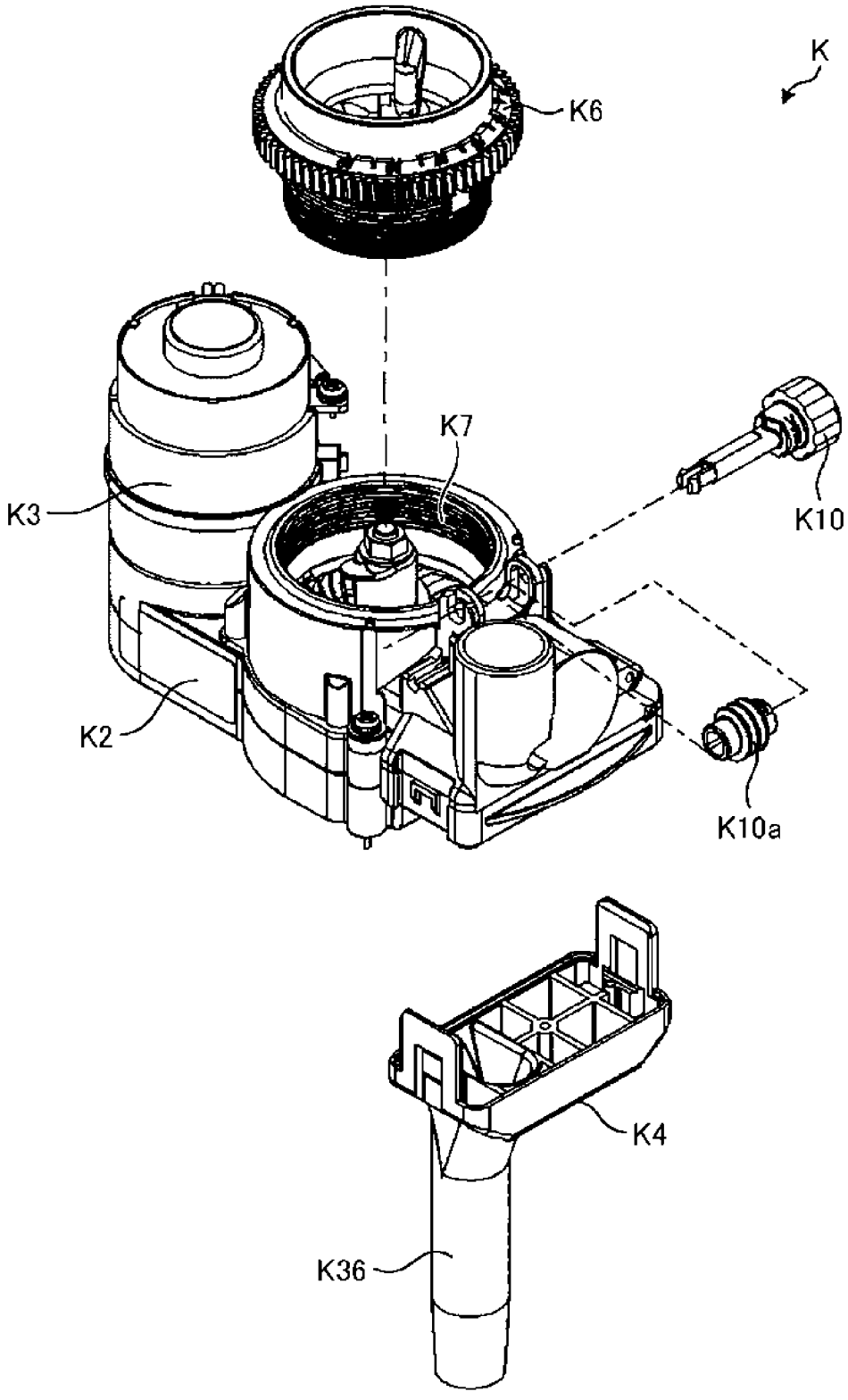


图89

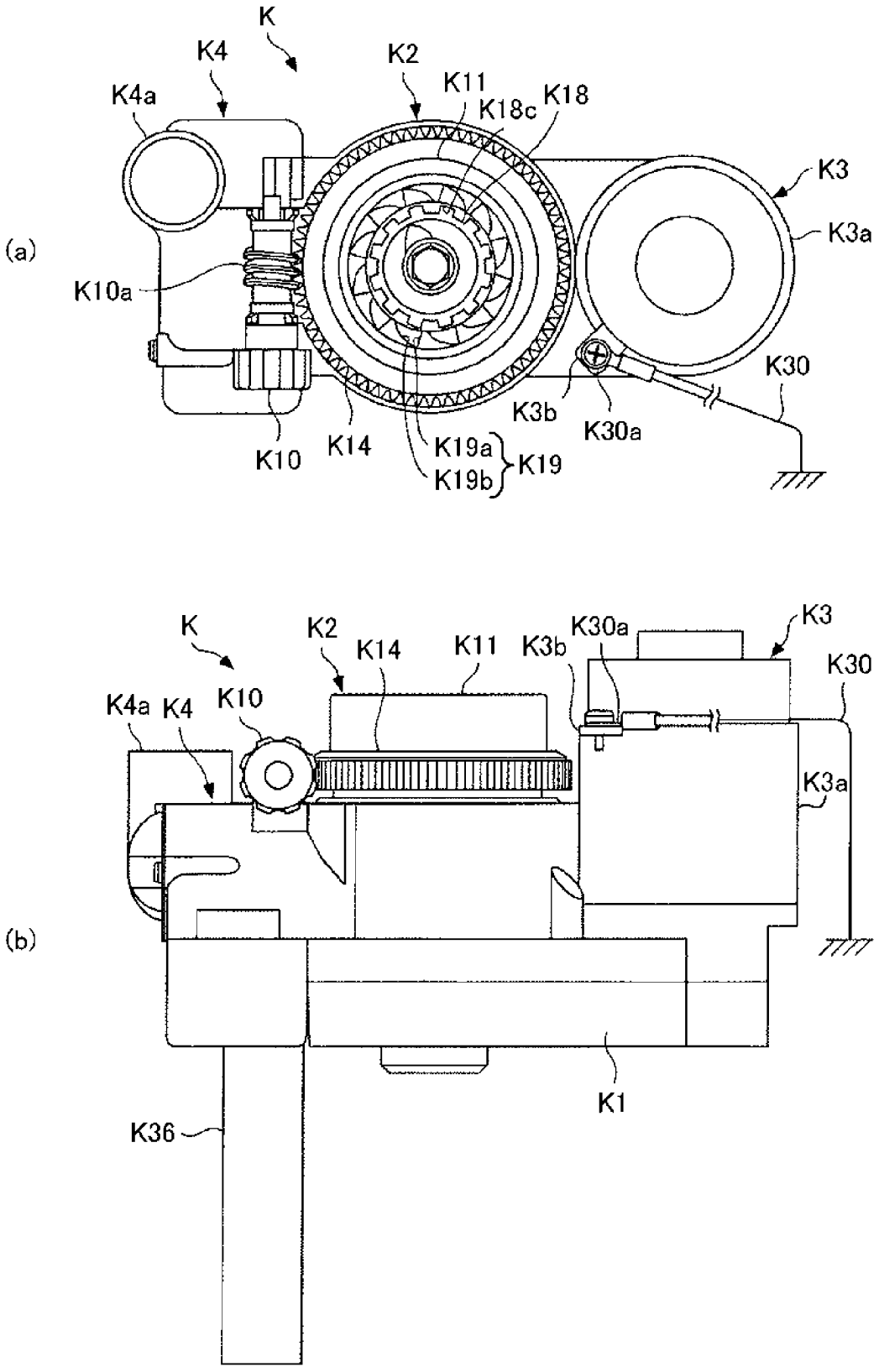


图90

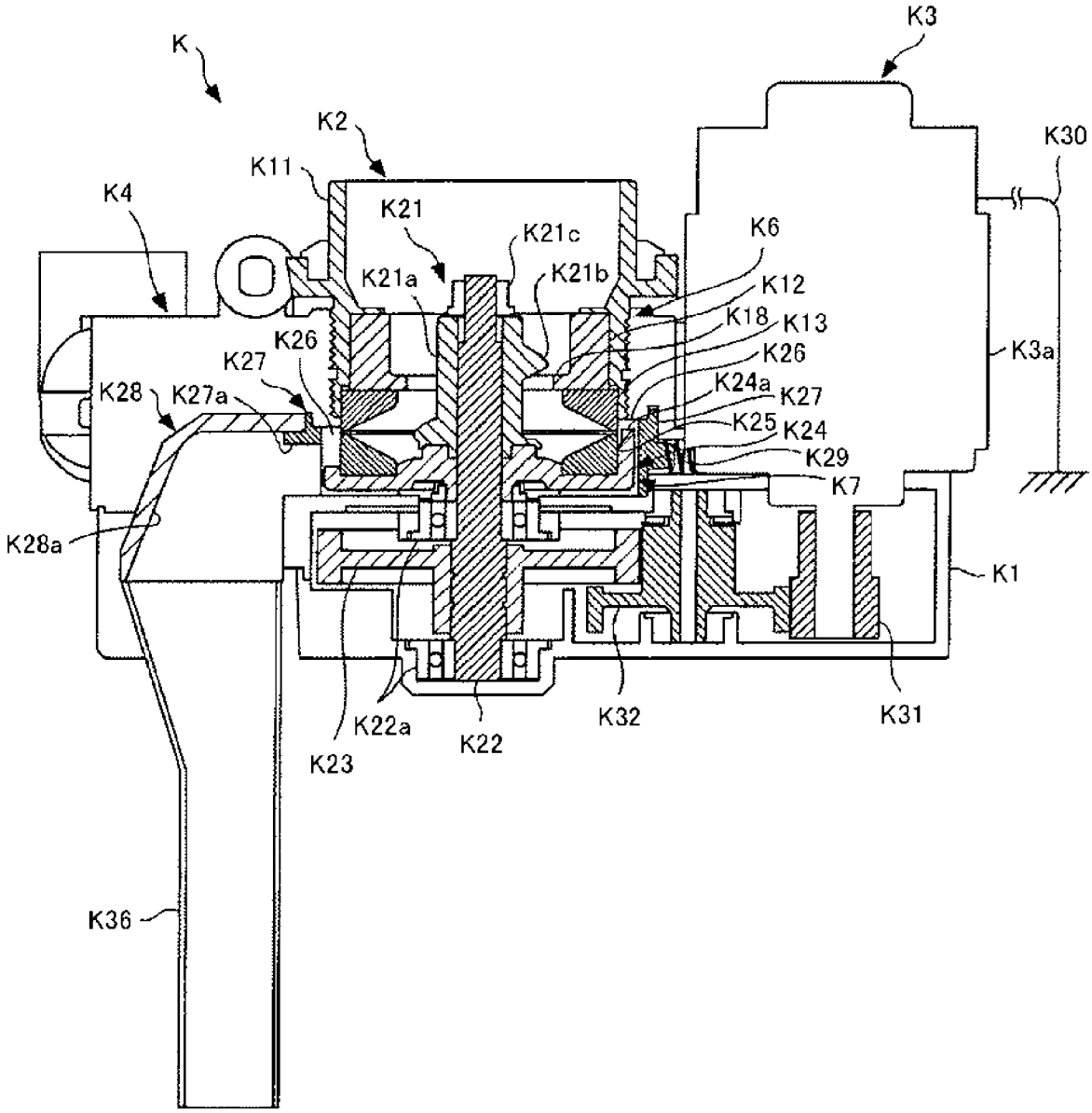


图91

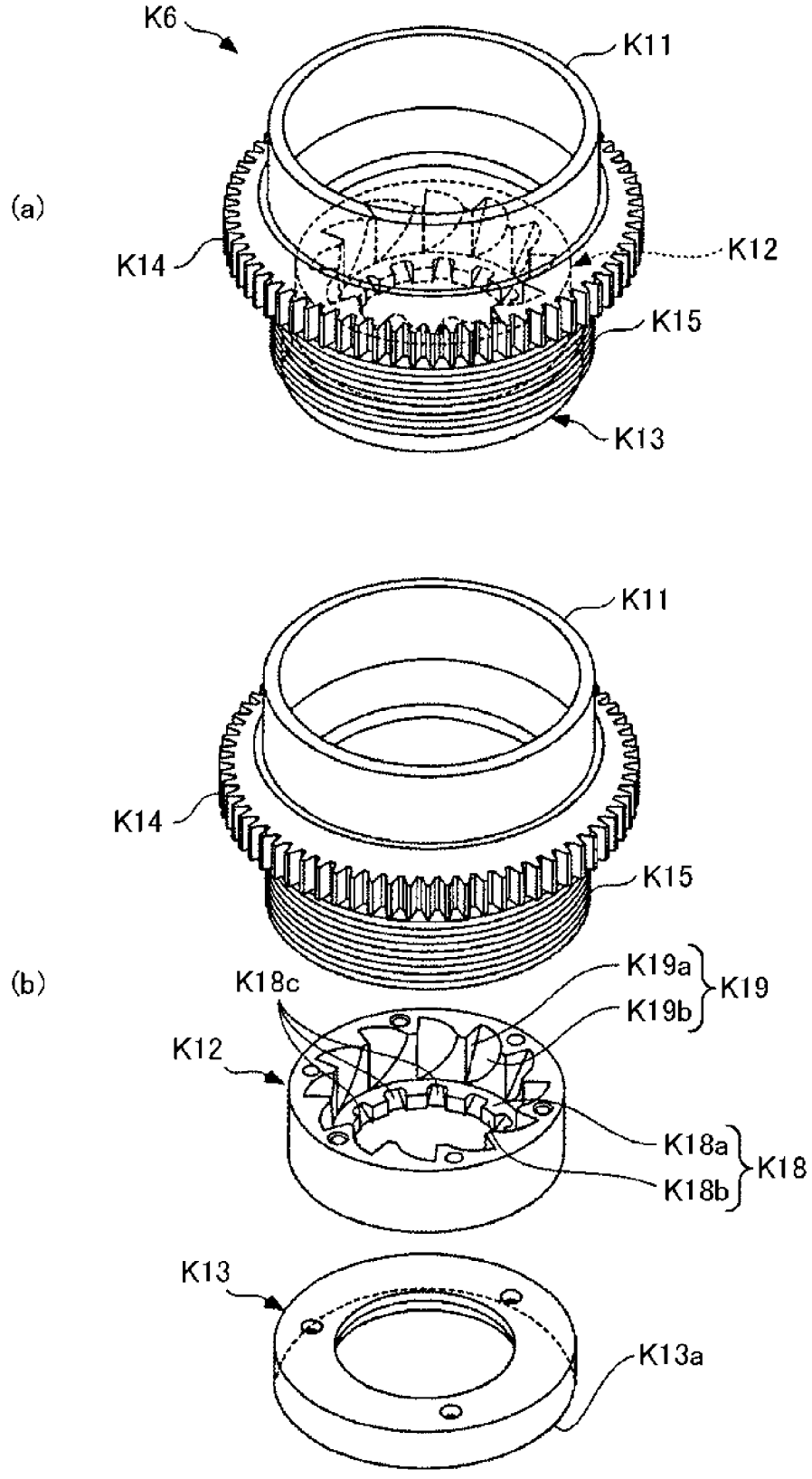
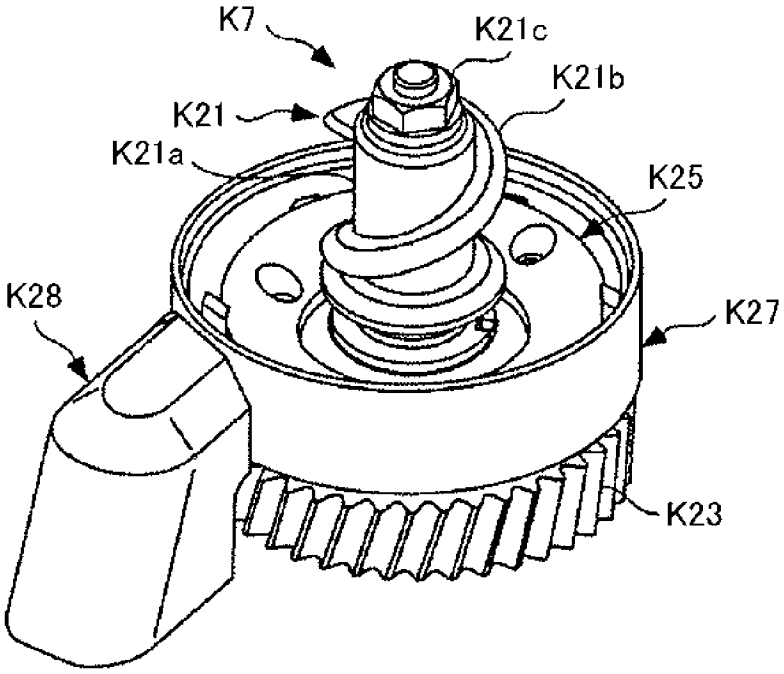


图92

(a)



(b)

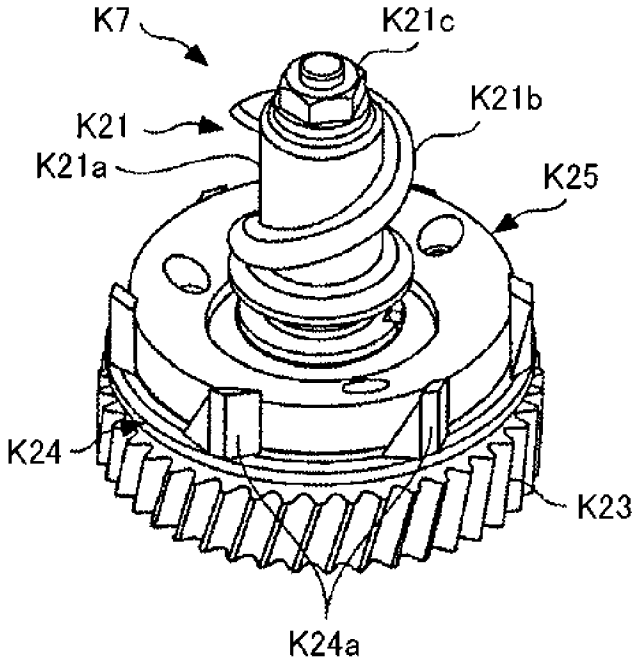


图93

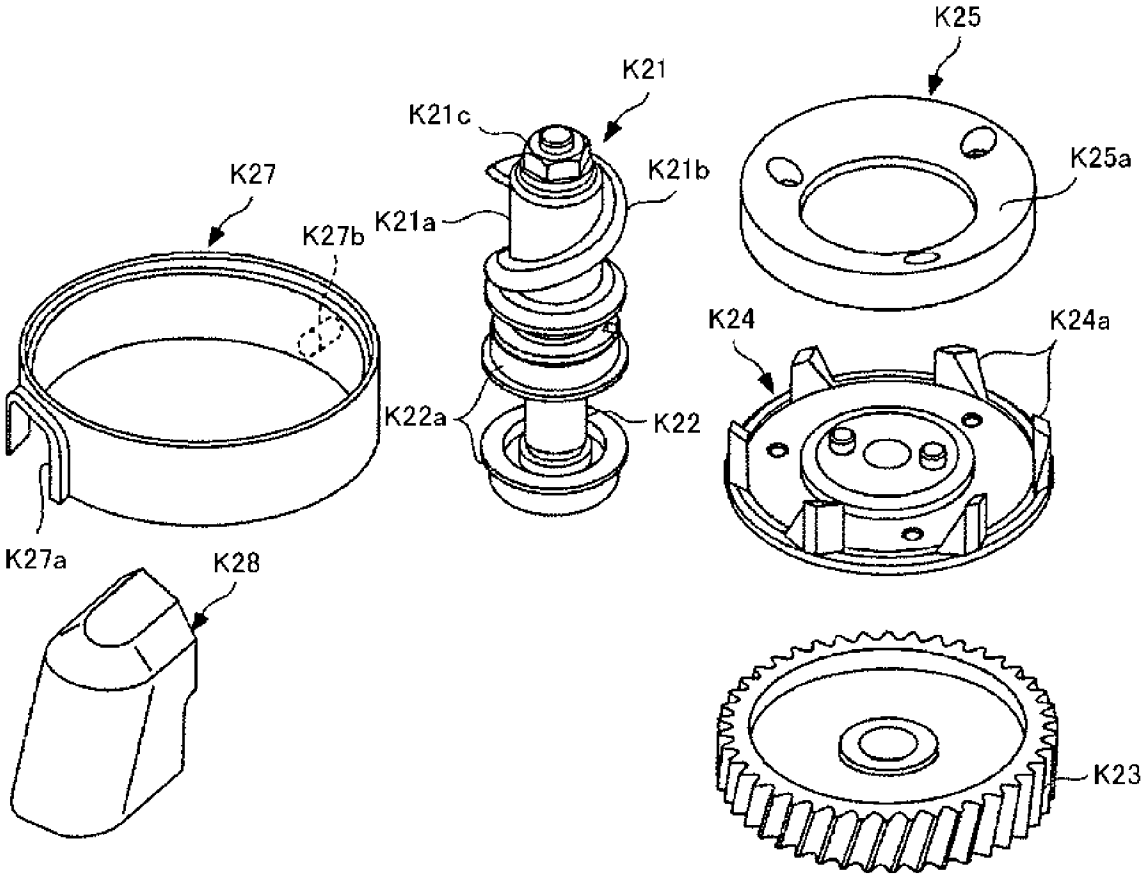


图94

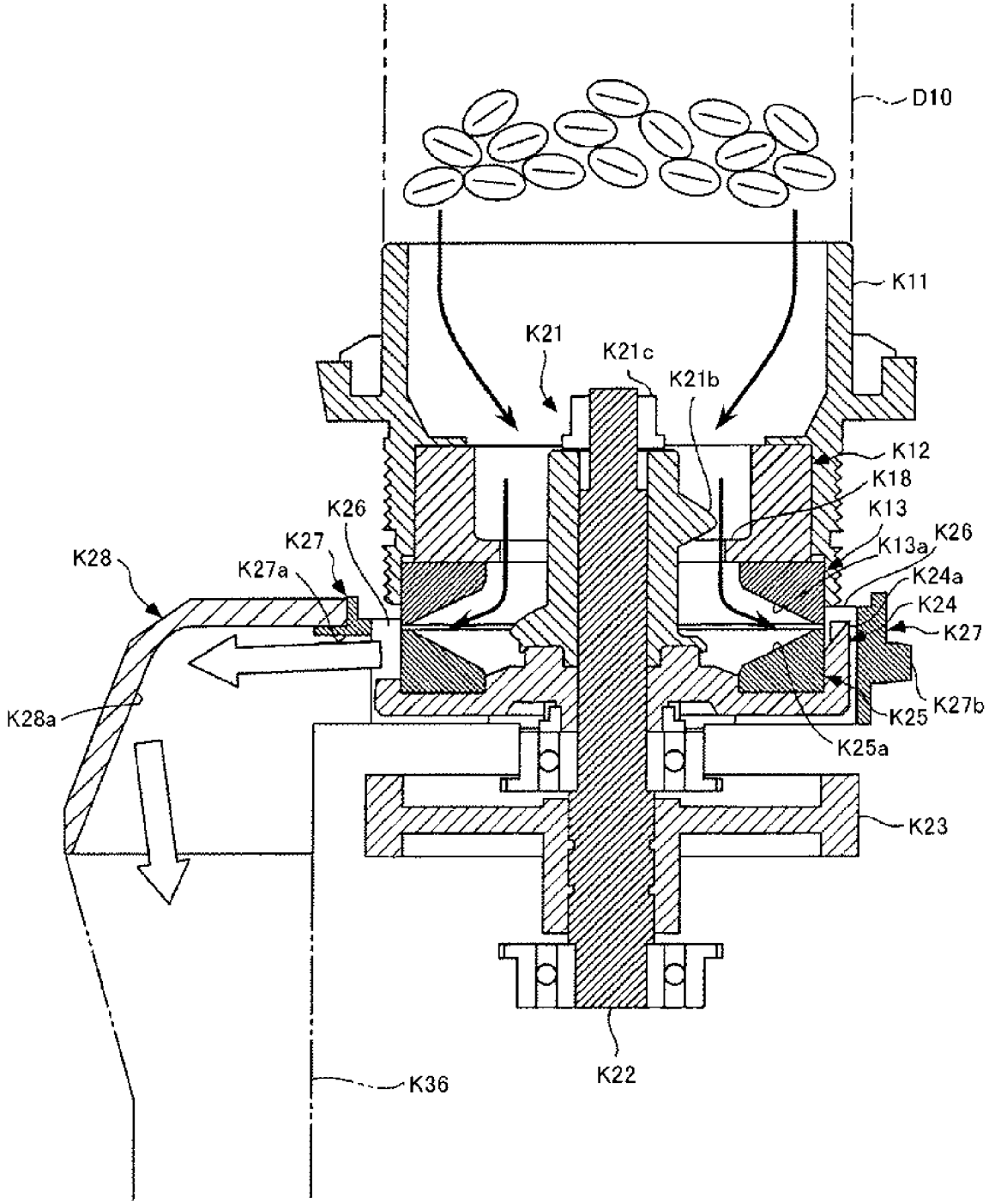


图95

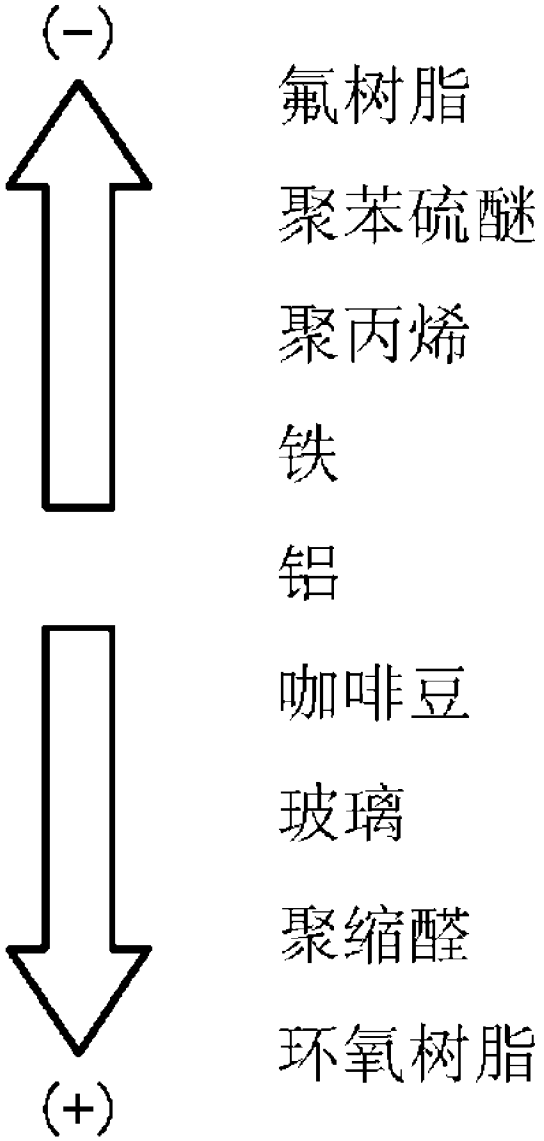


图96

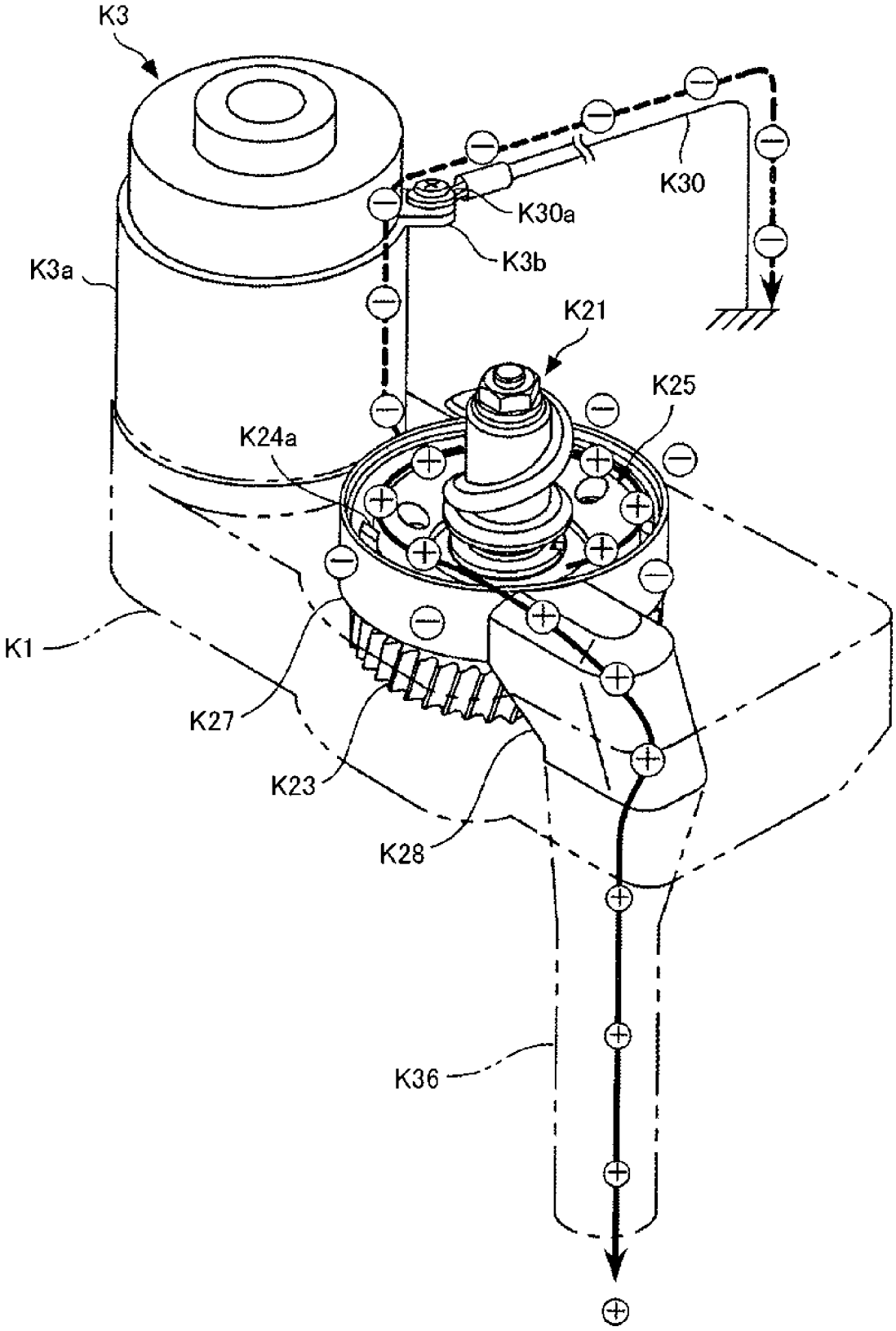


图97

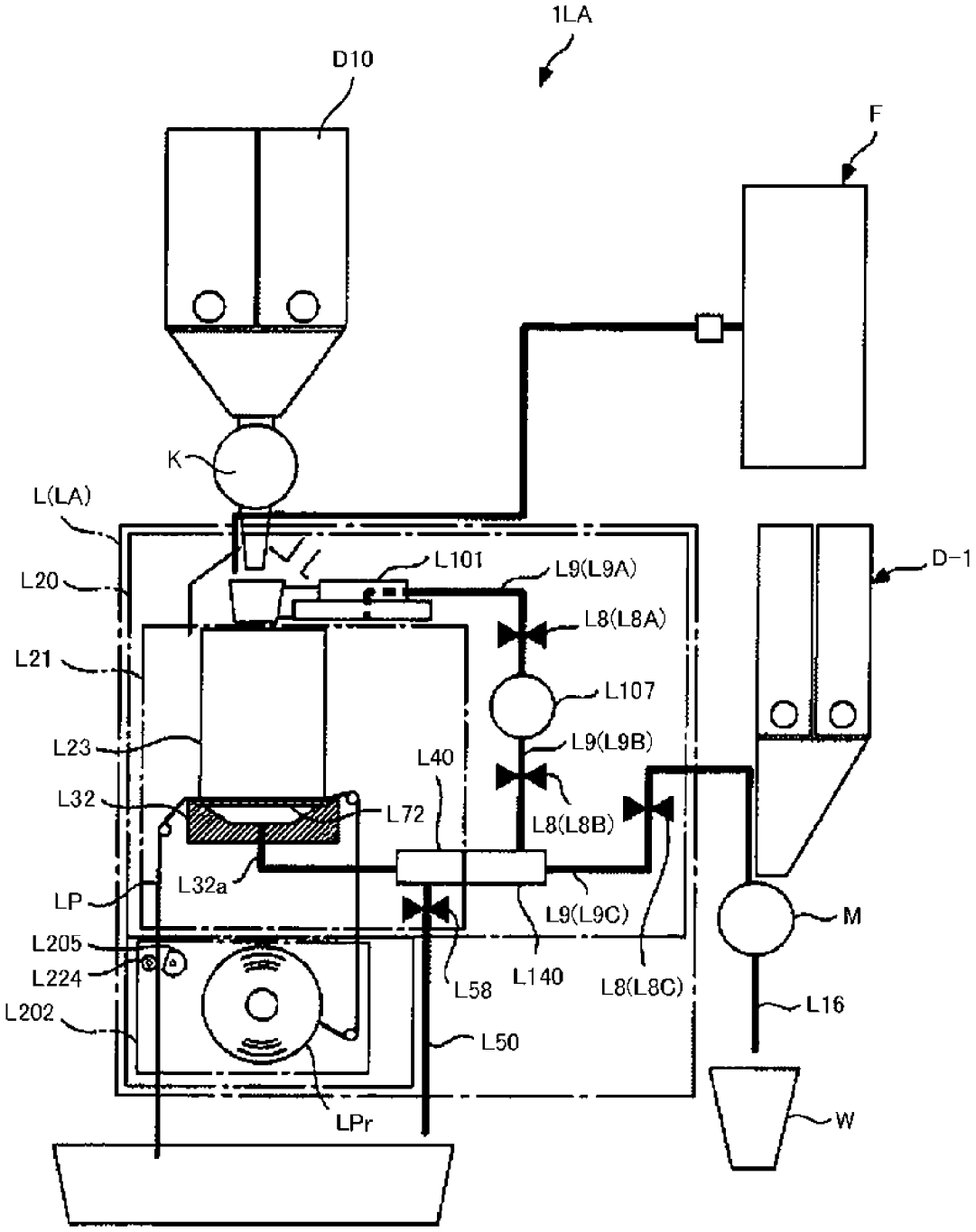


图98

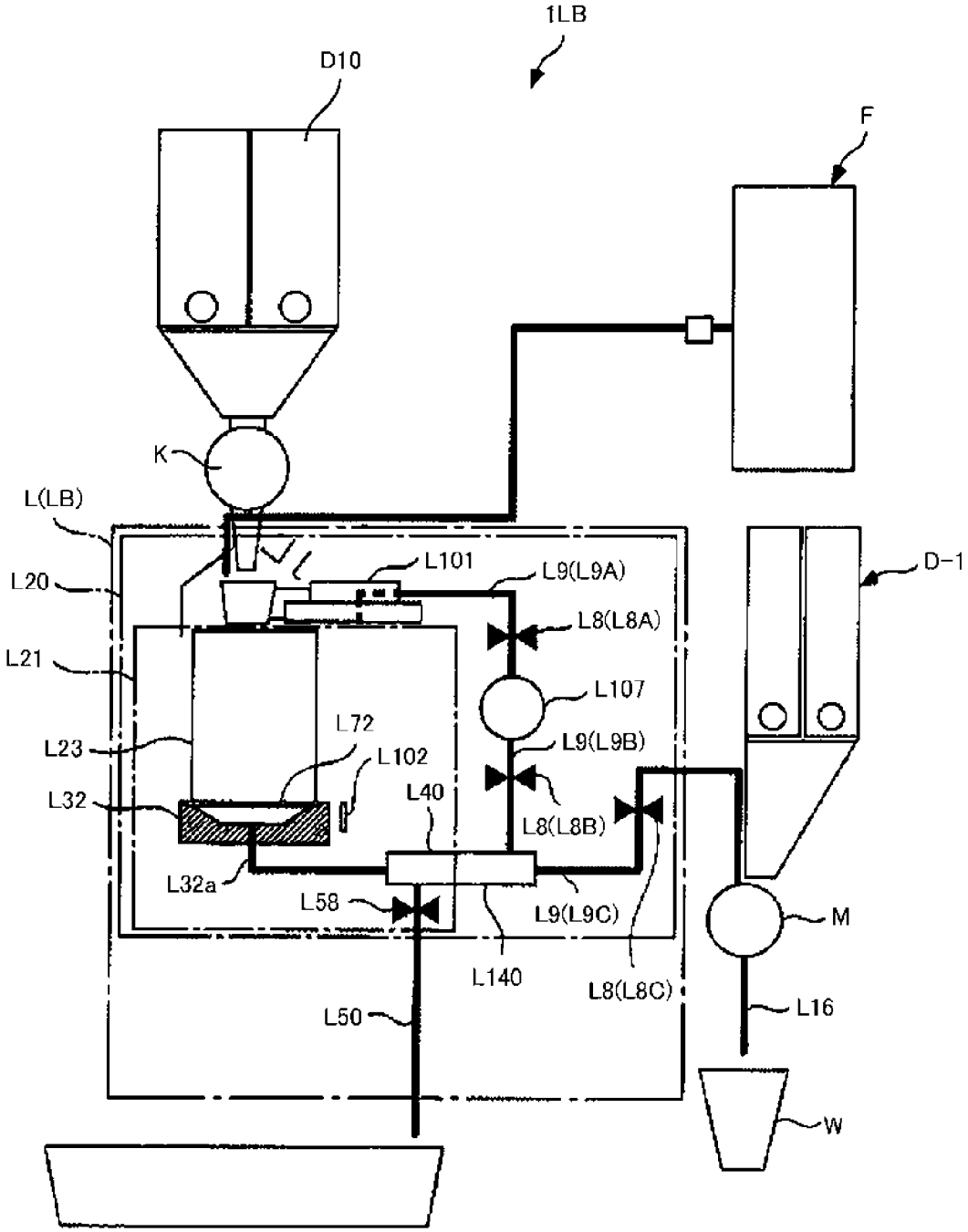


图99

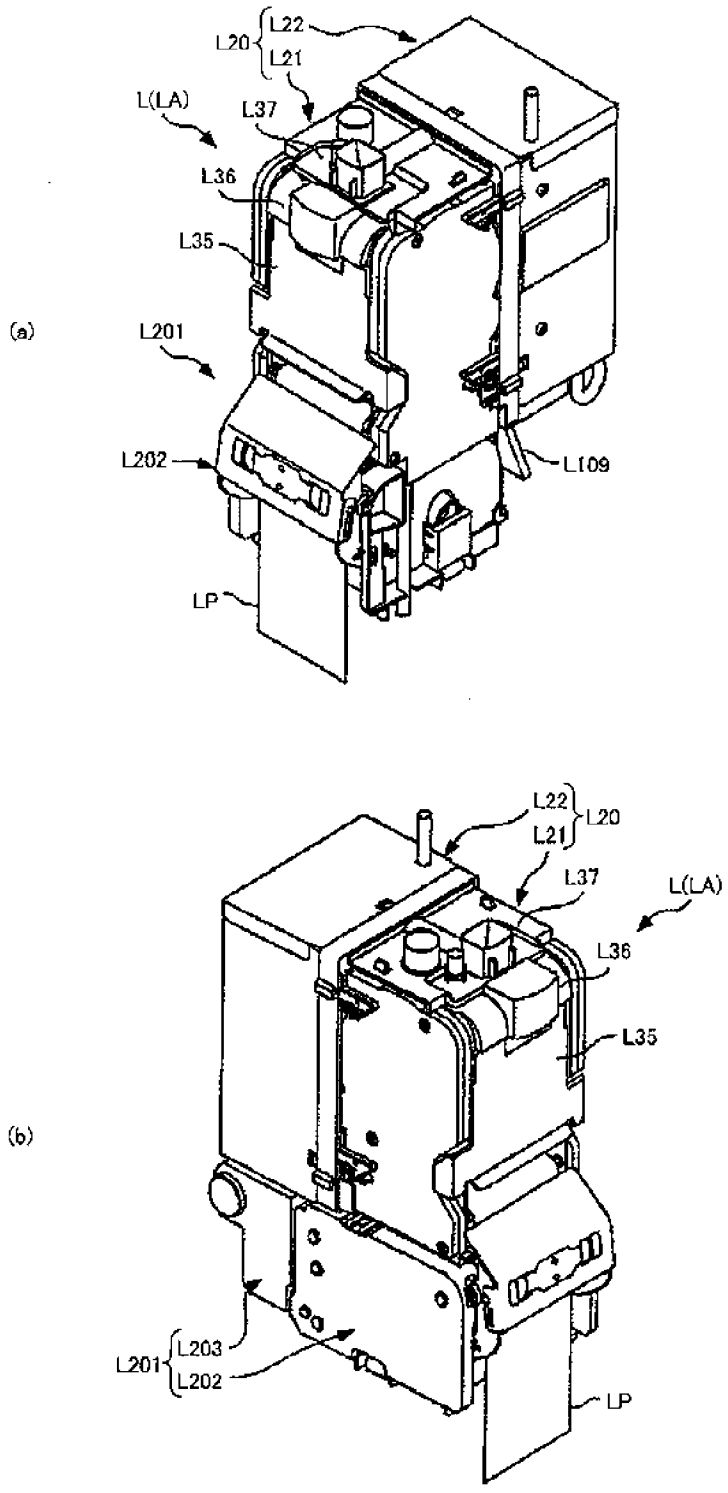
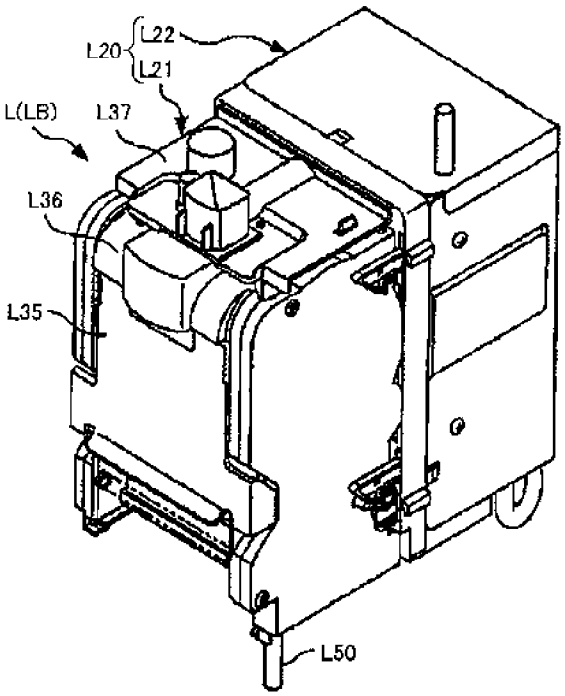


图100

(a)



(b)

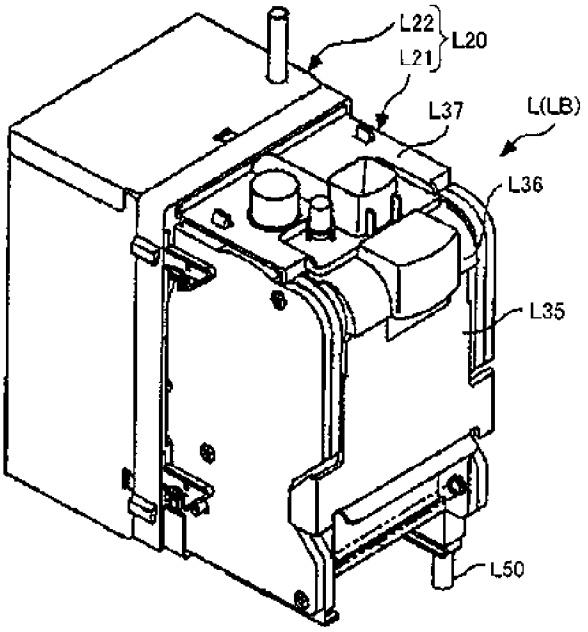


图101

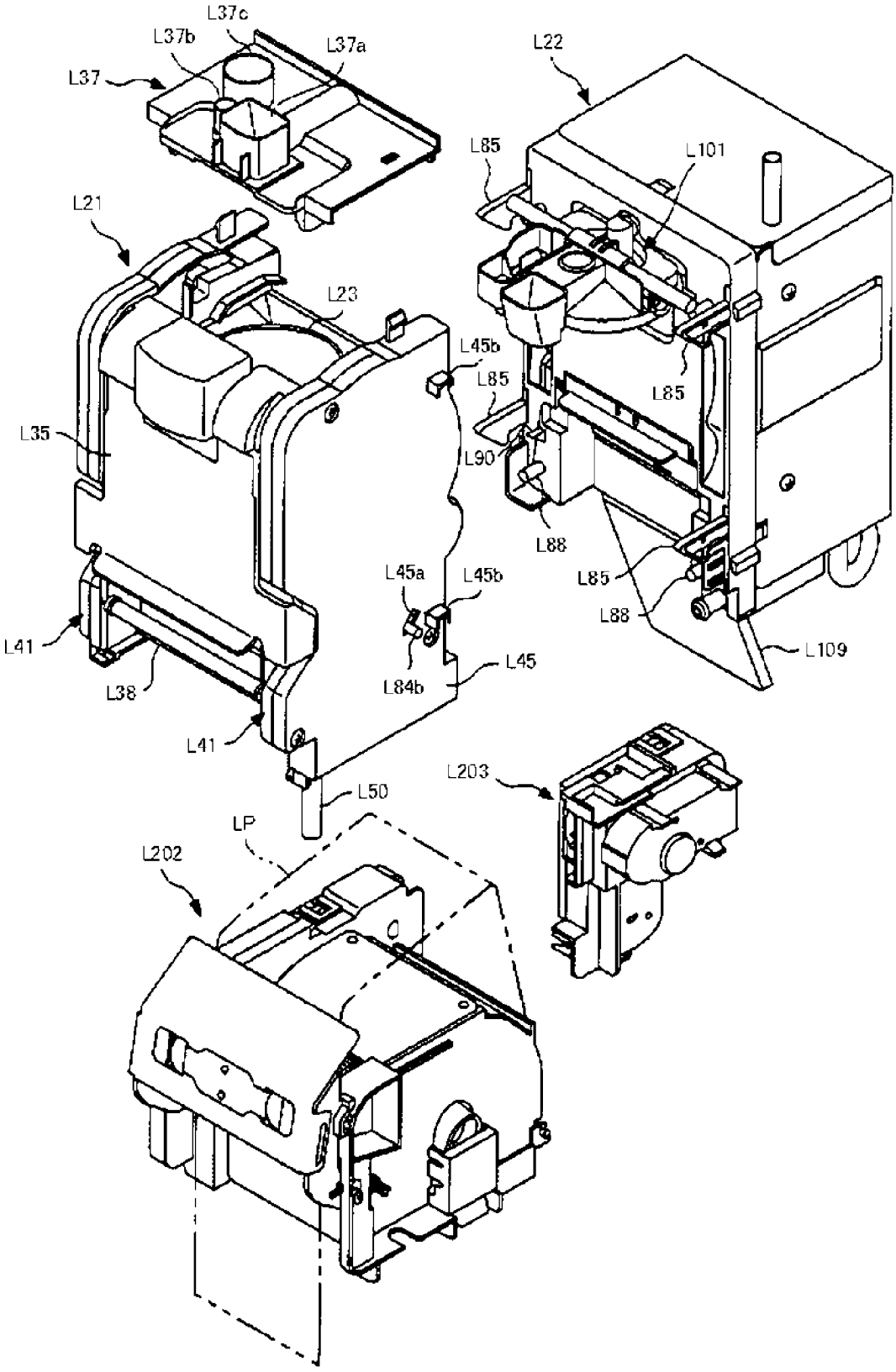


图102

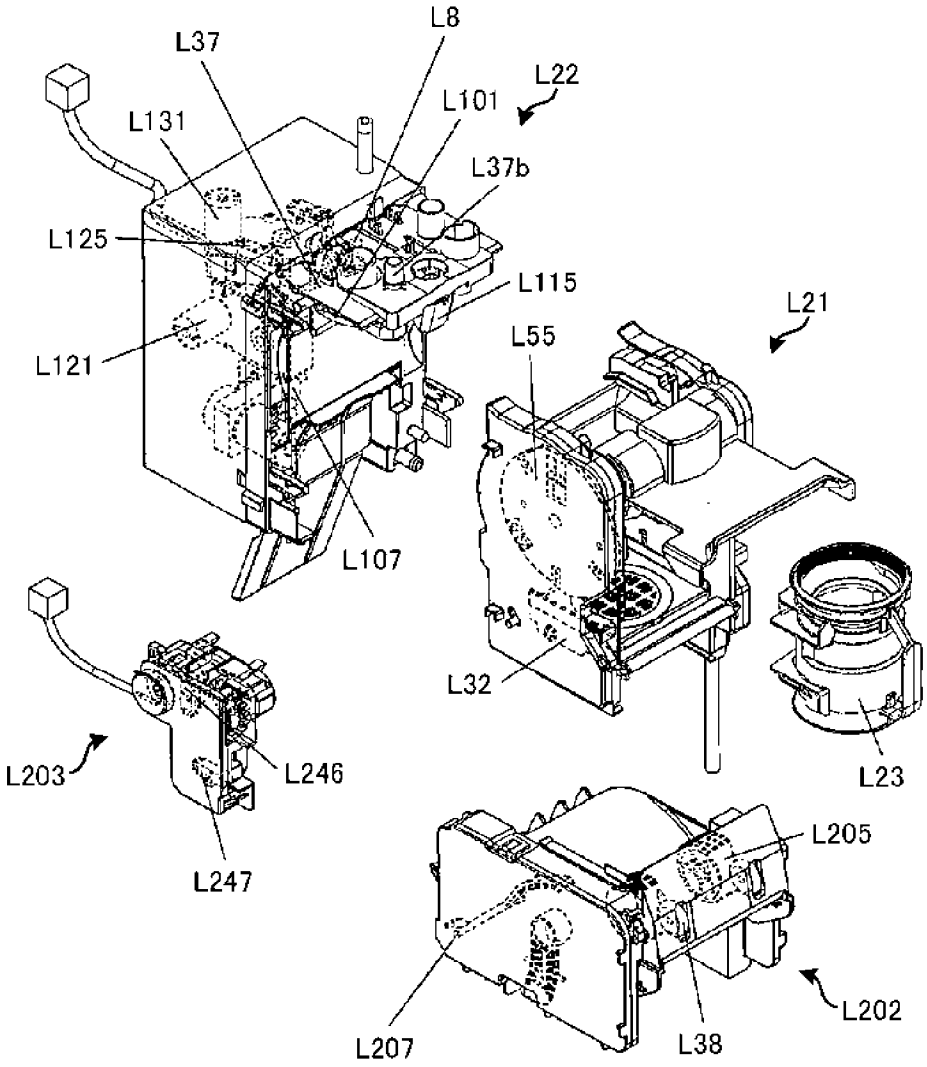


图103

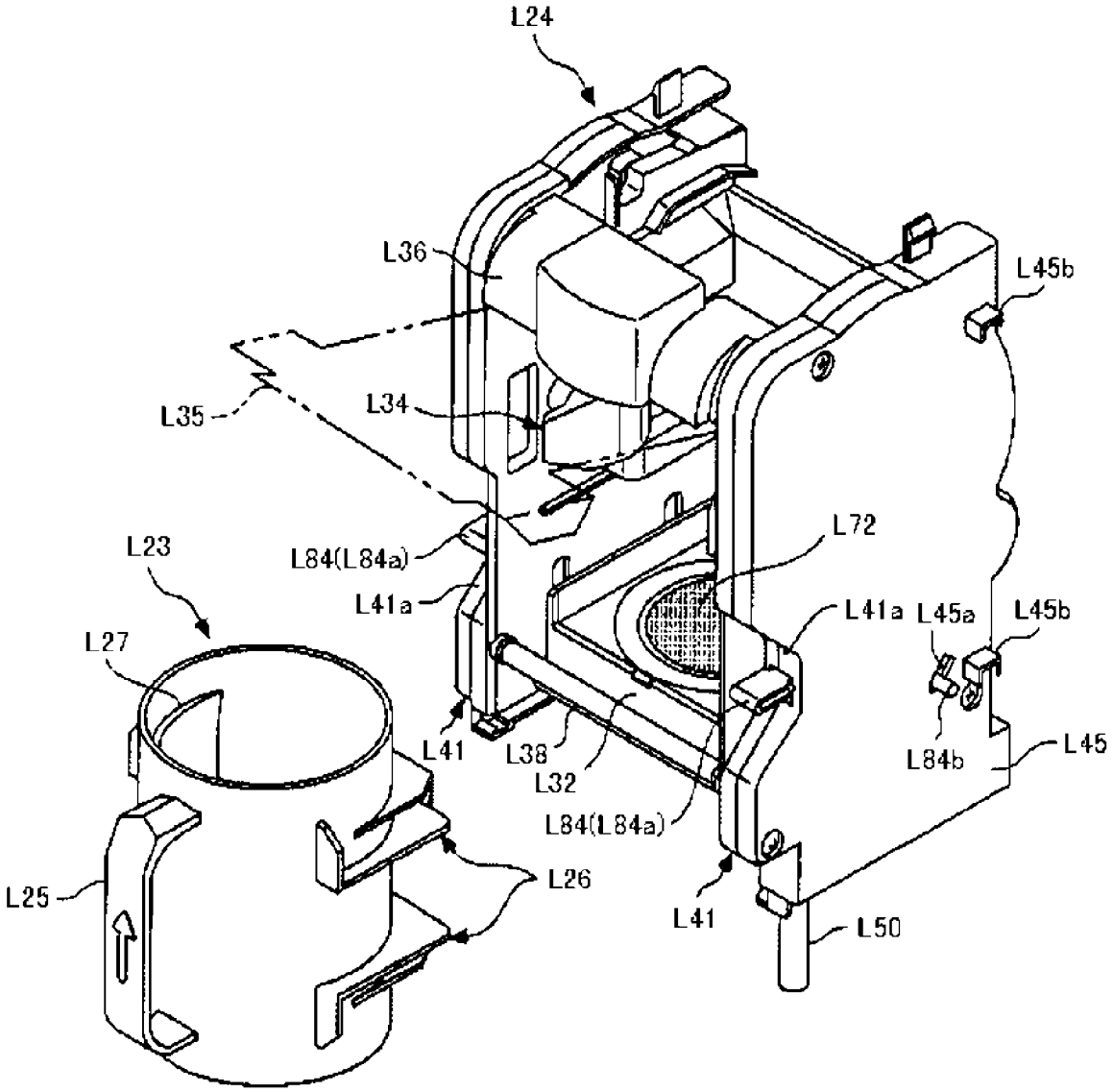


图104

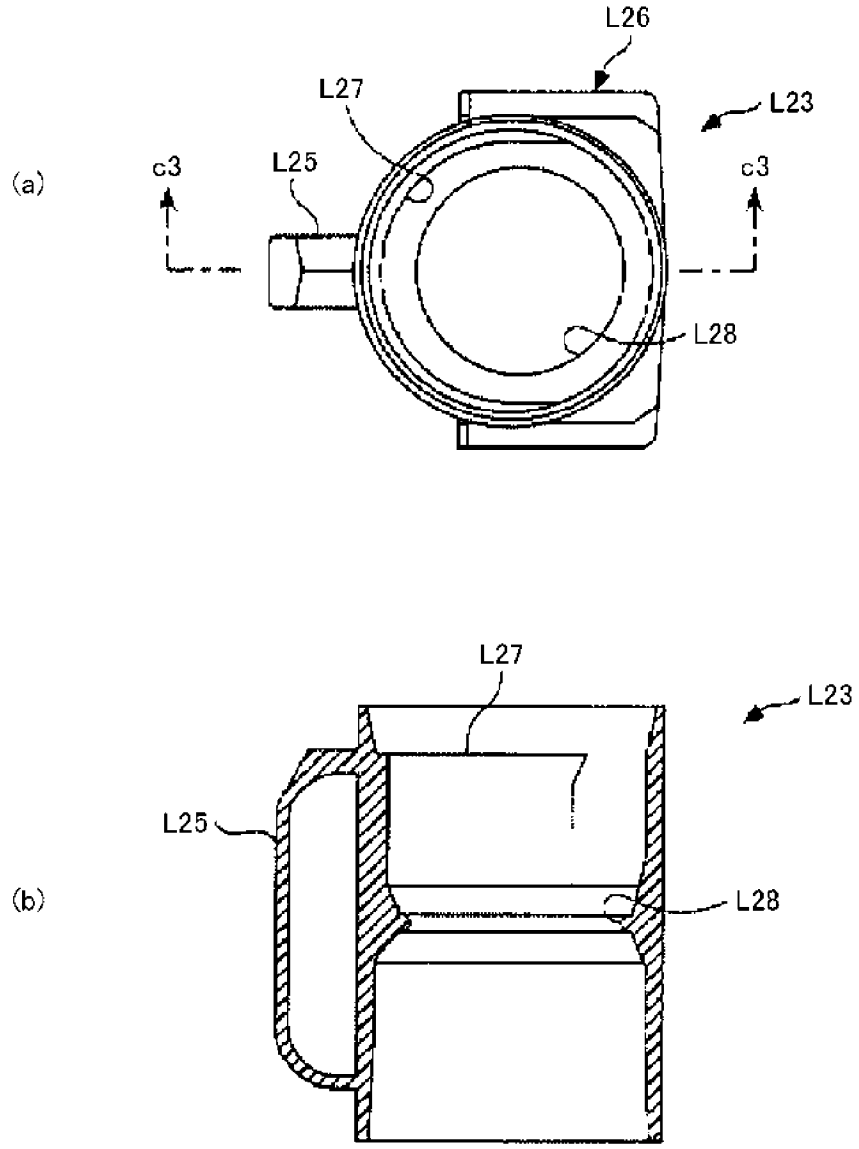


图105

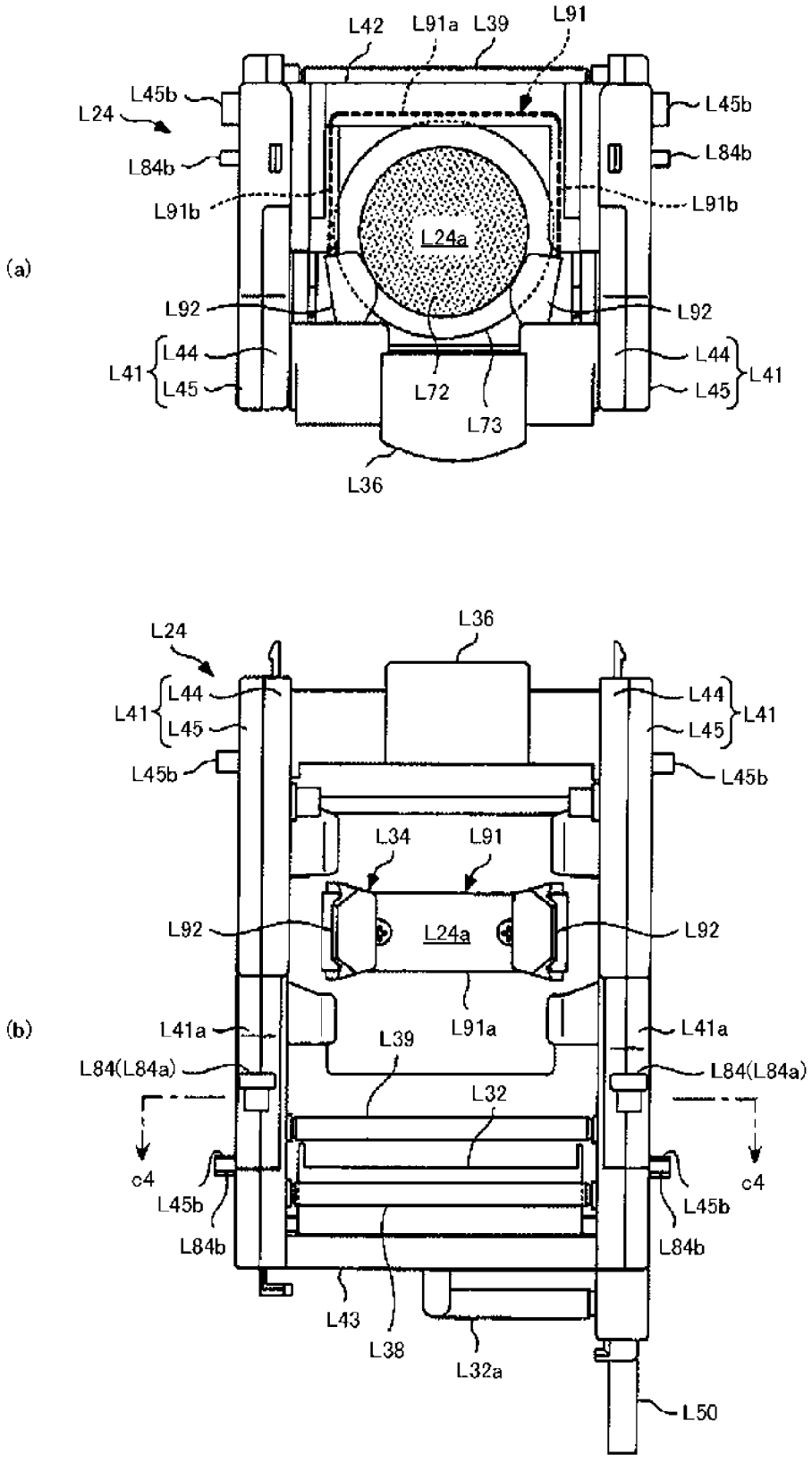
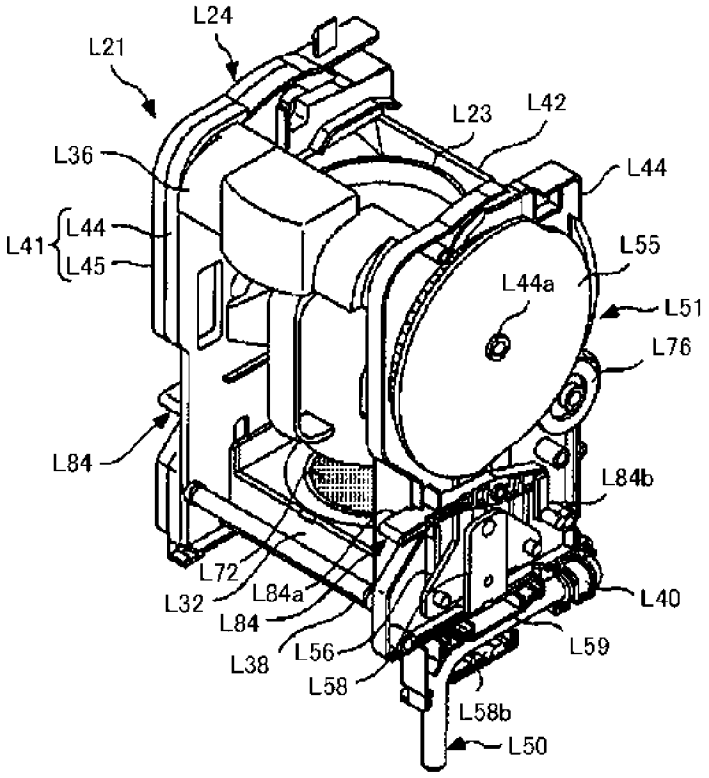


图106

(a)



(b)

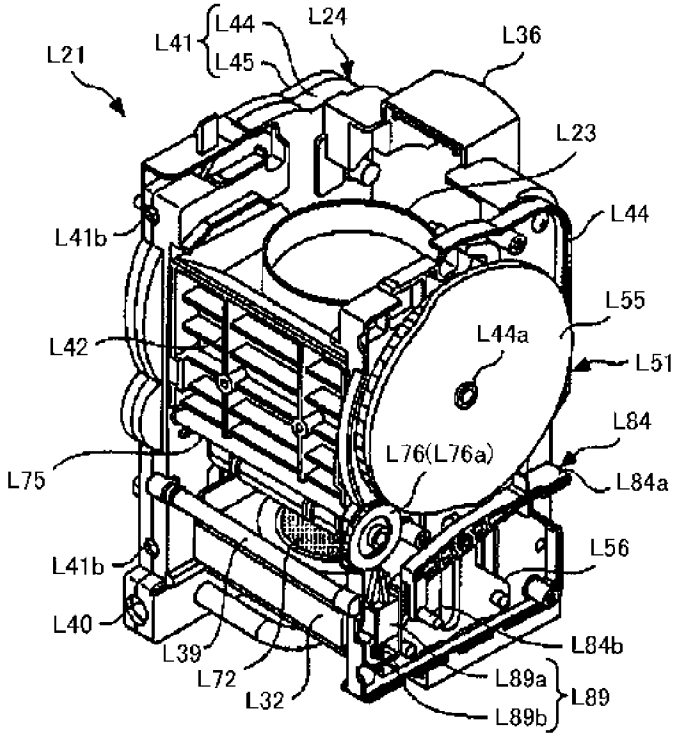


图107

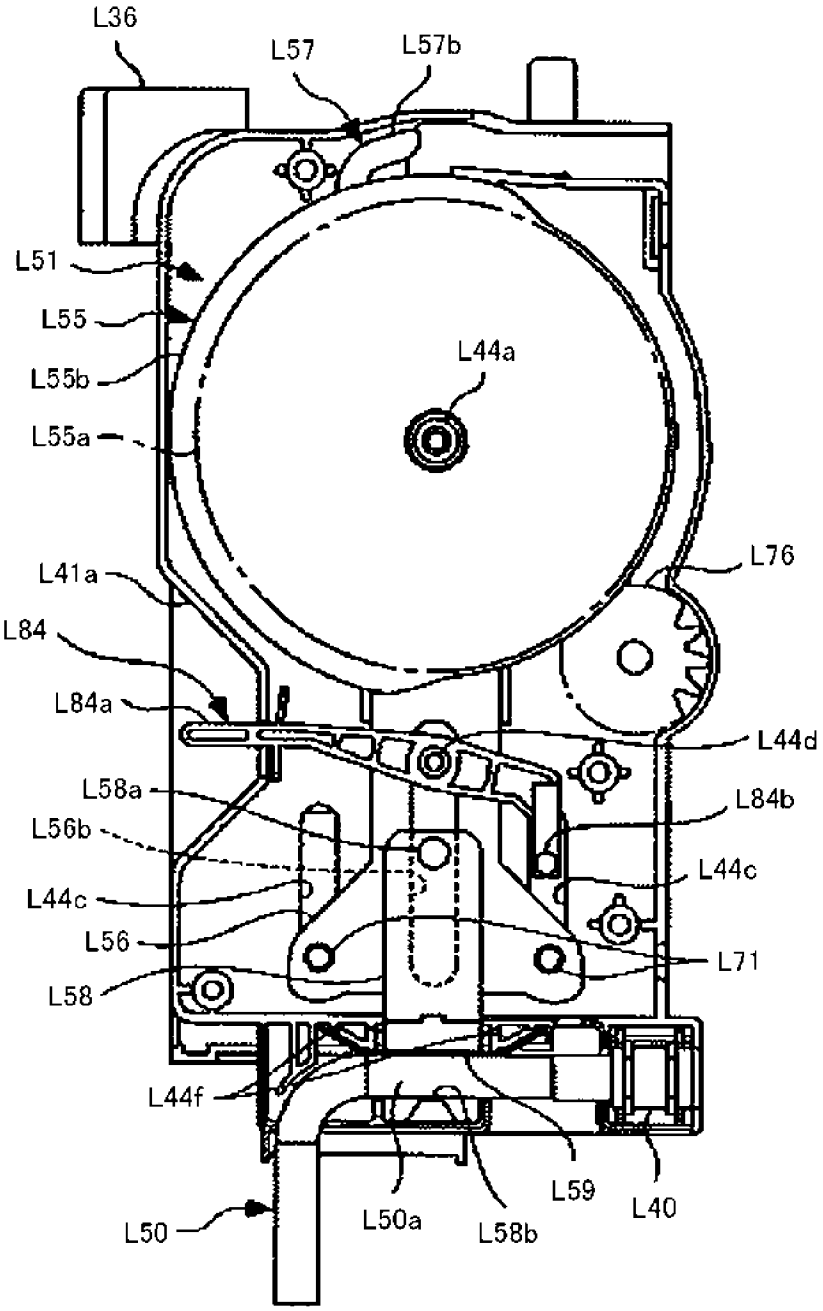


图108

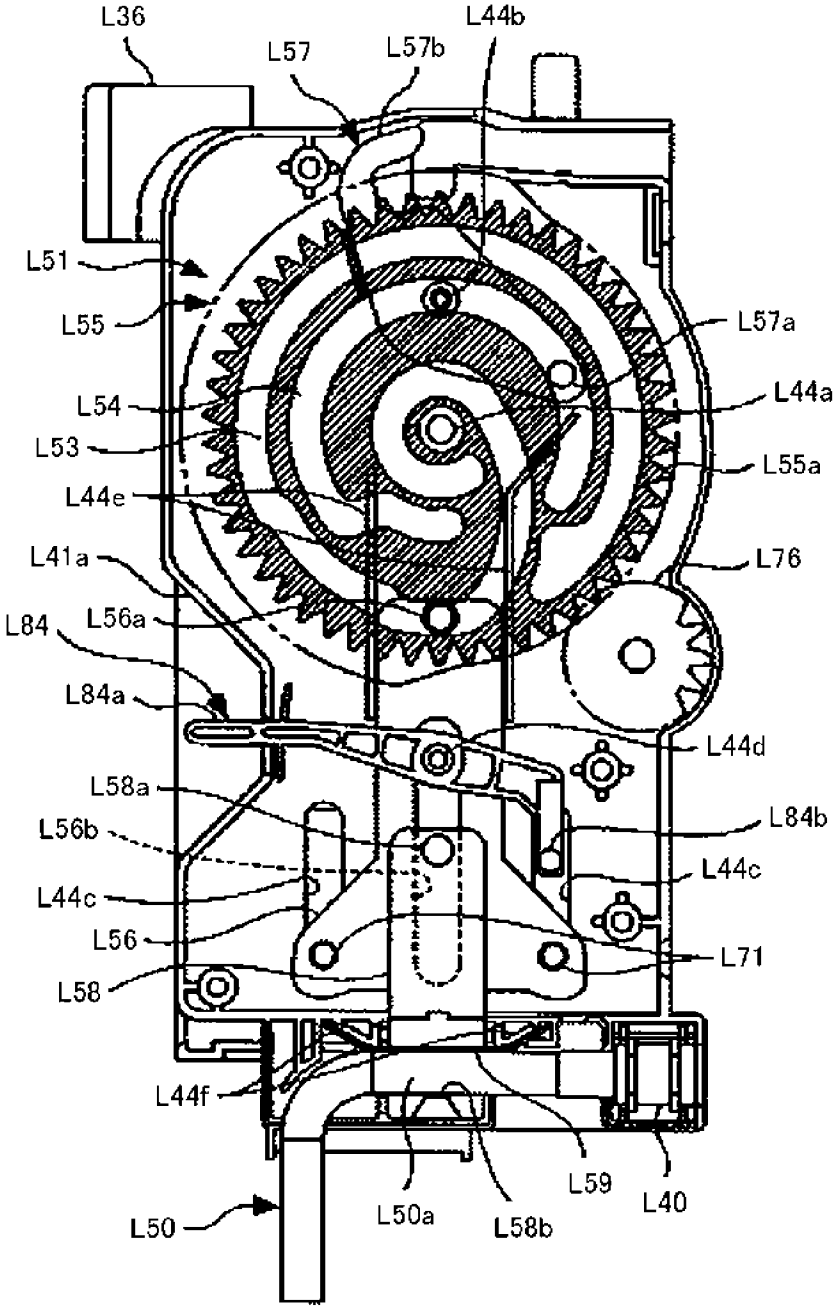


图109

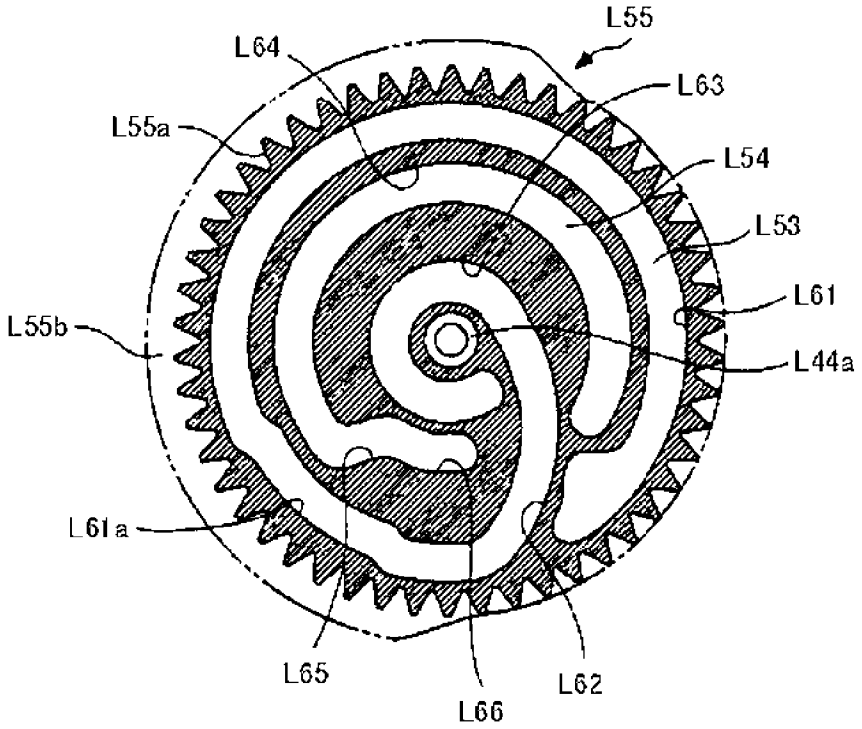


图110

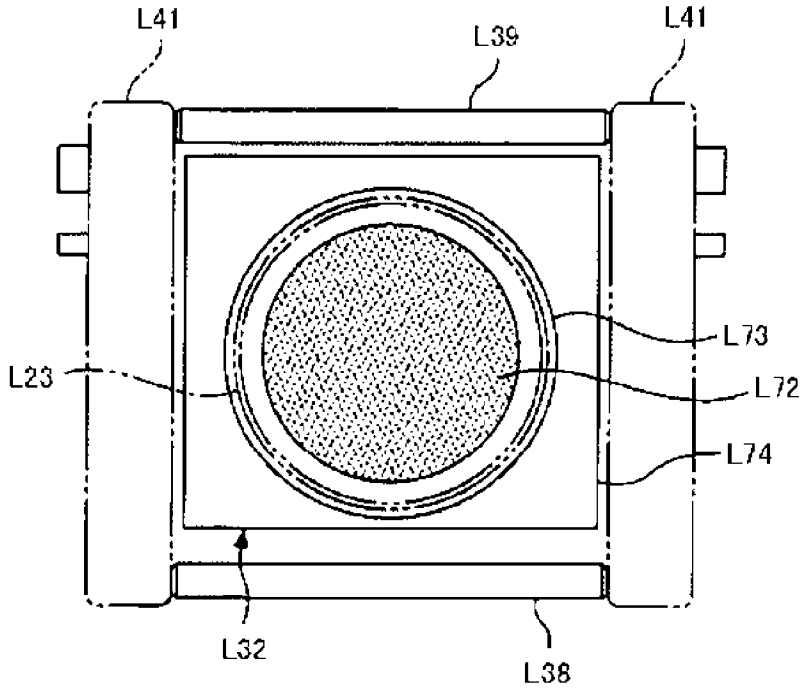


图111

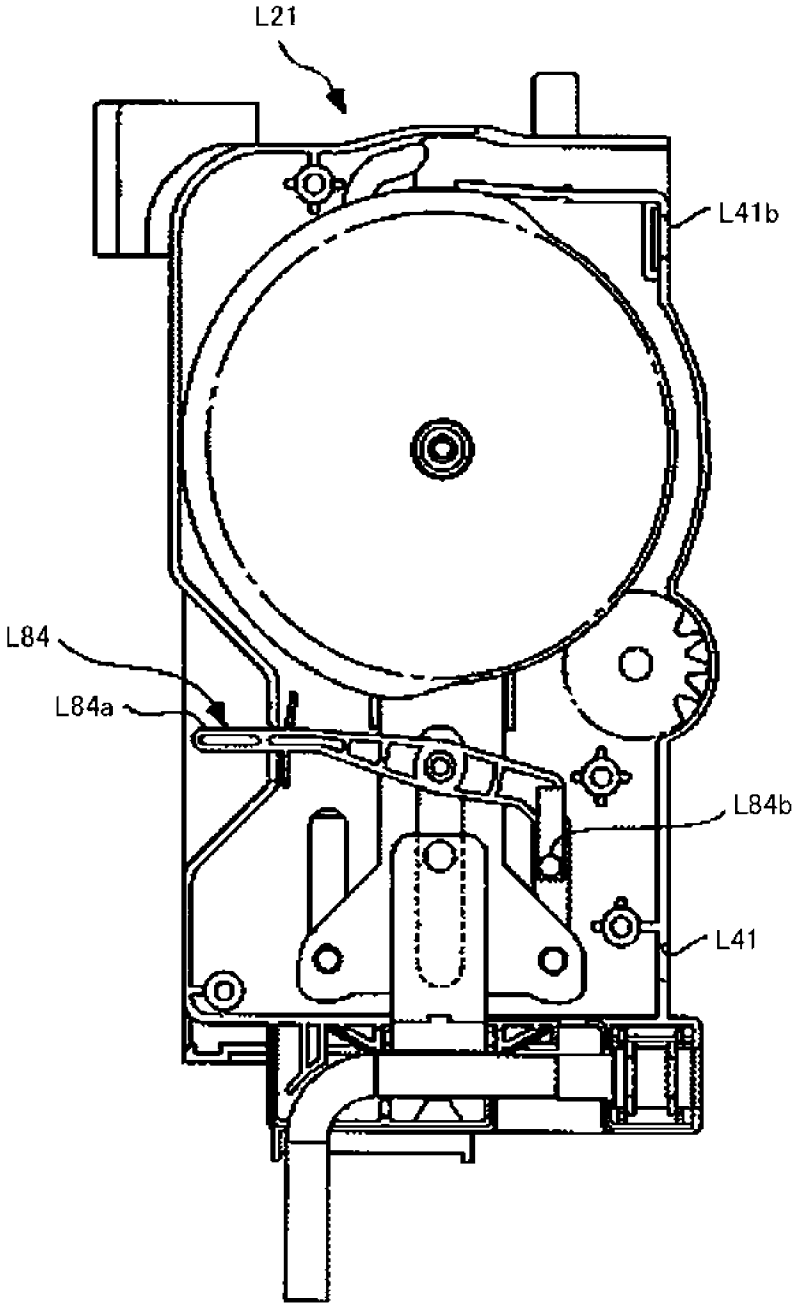


图112

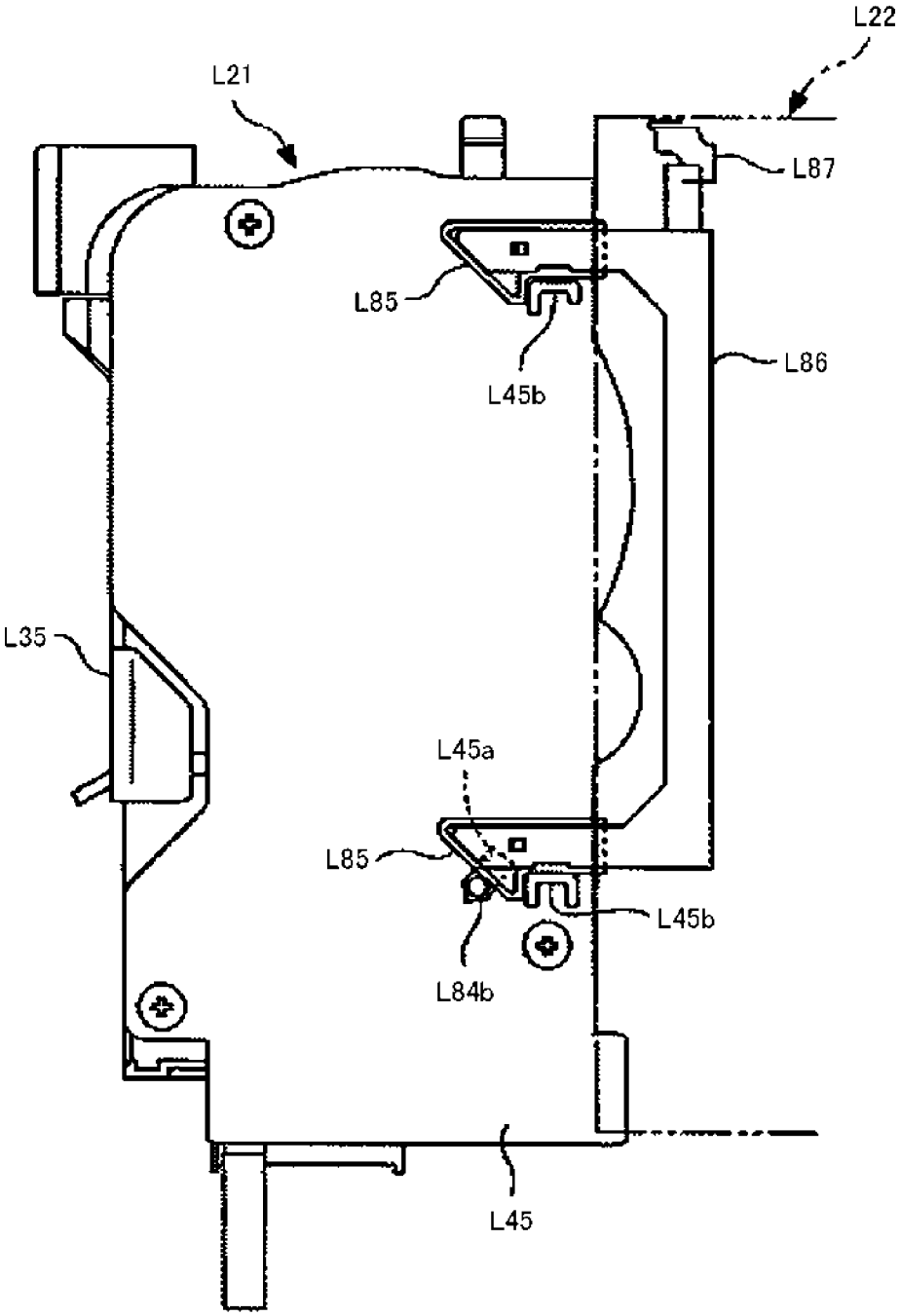


图113

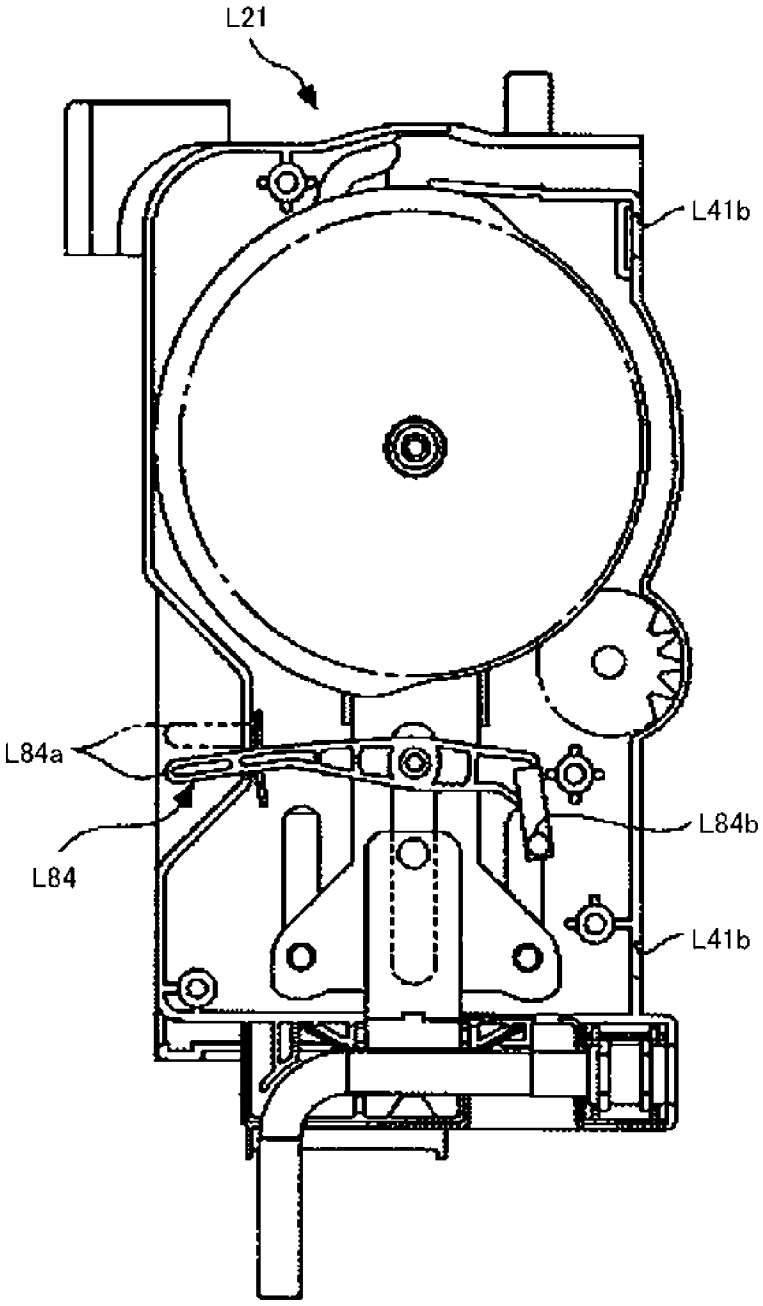


图114

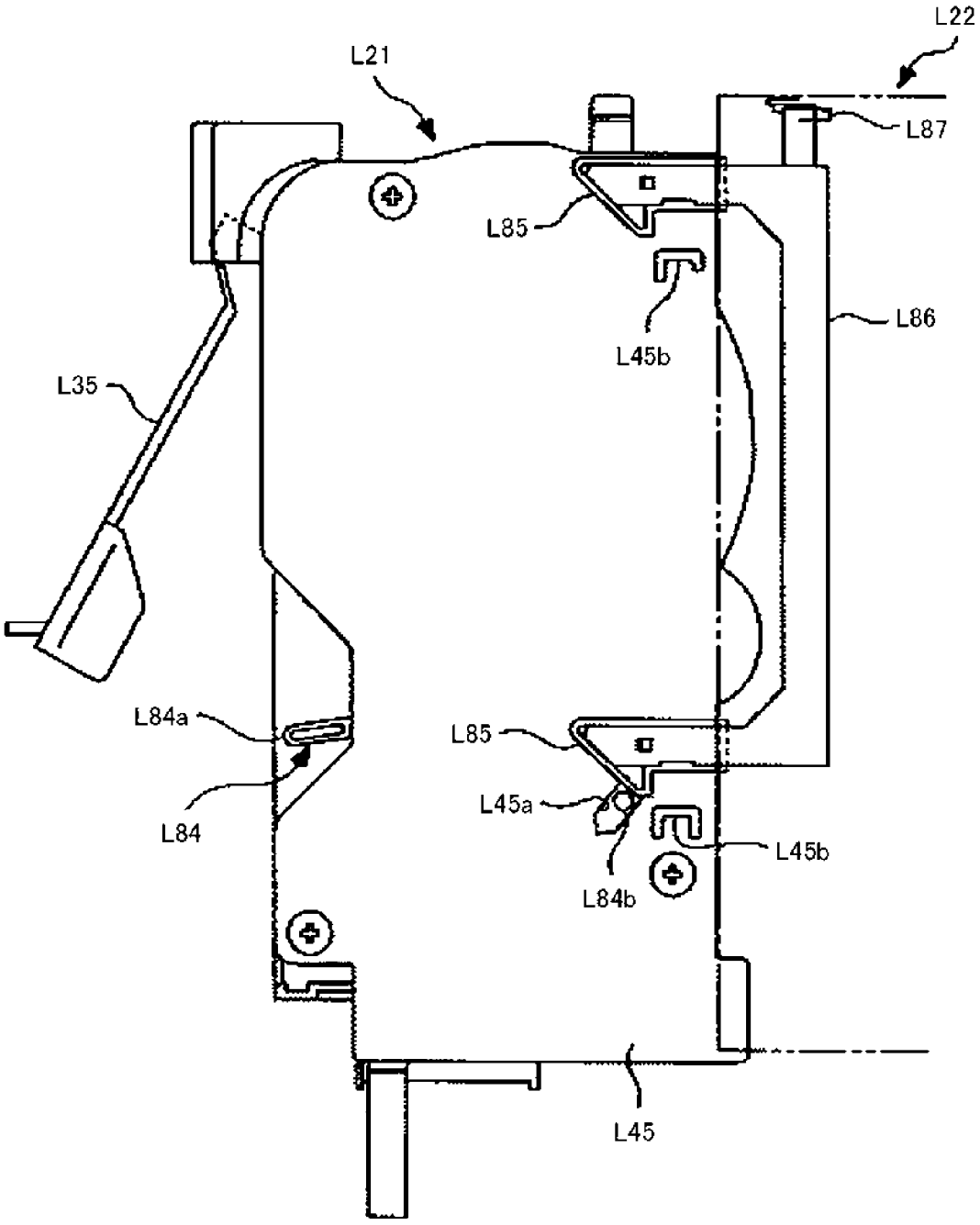


图115

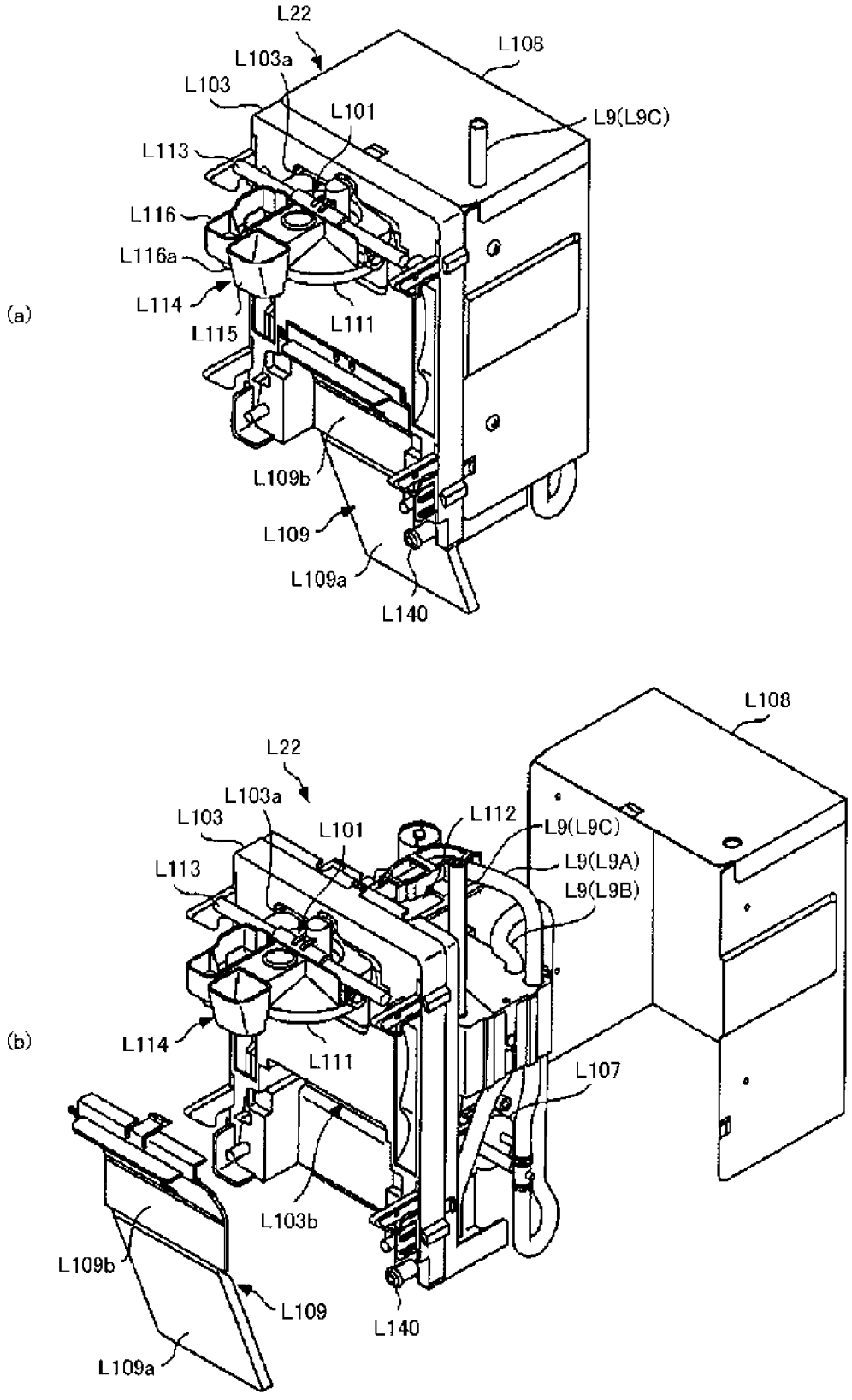


图116

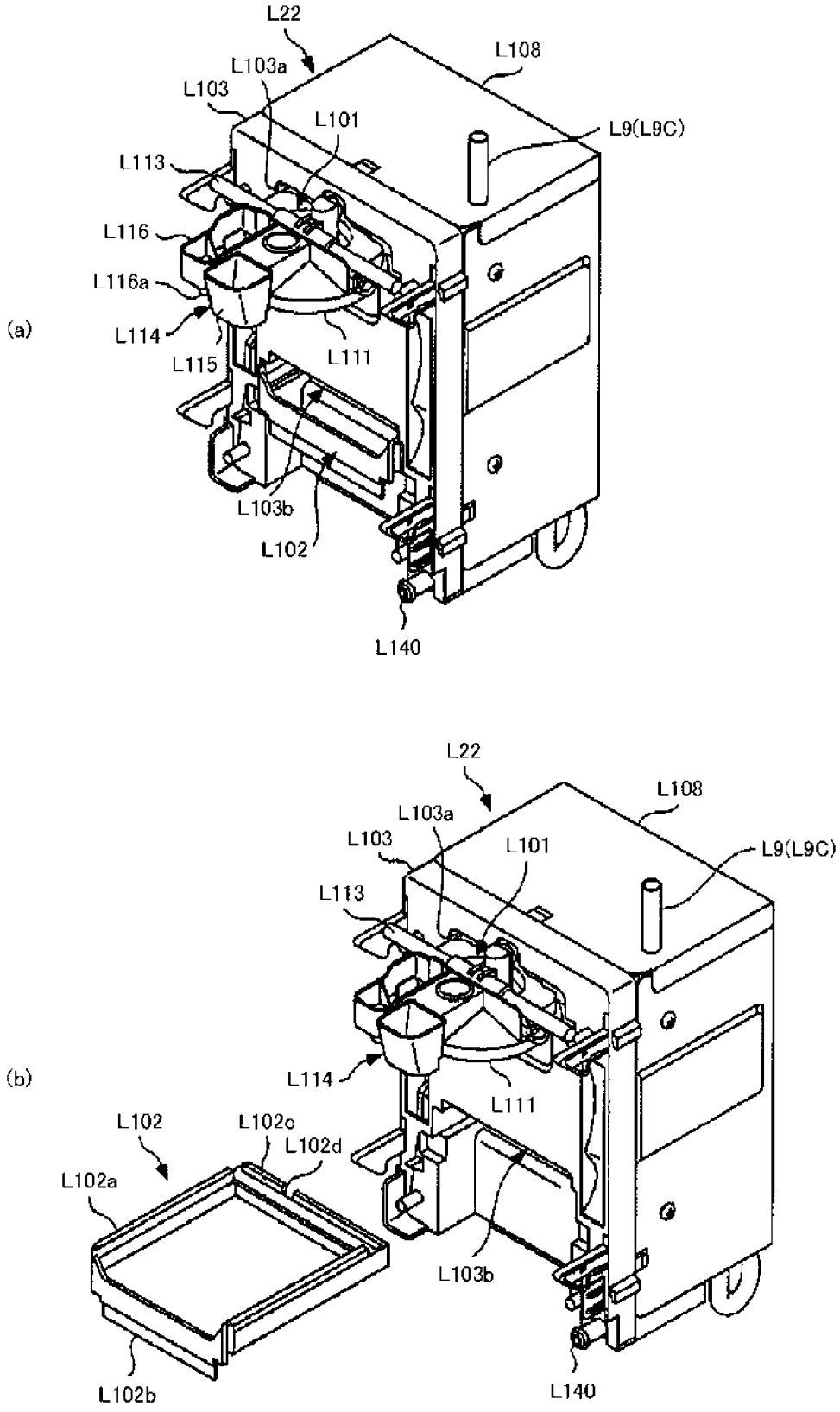


图117

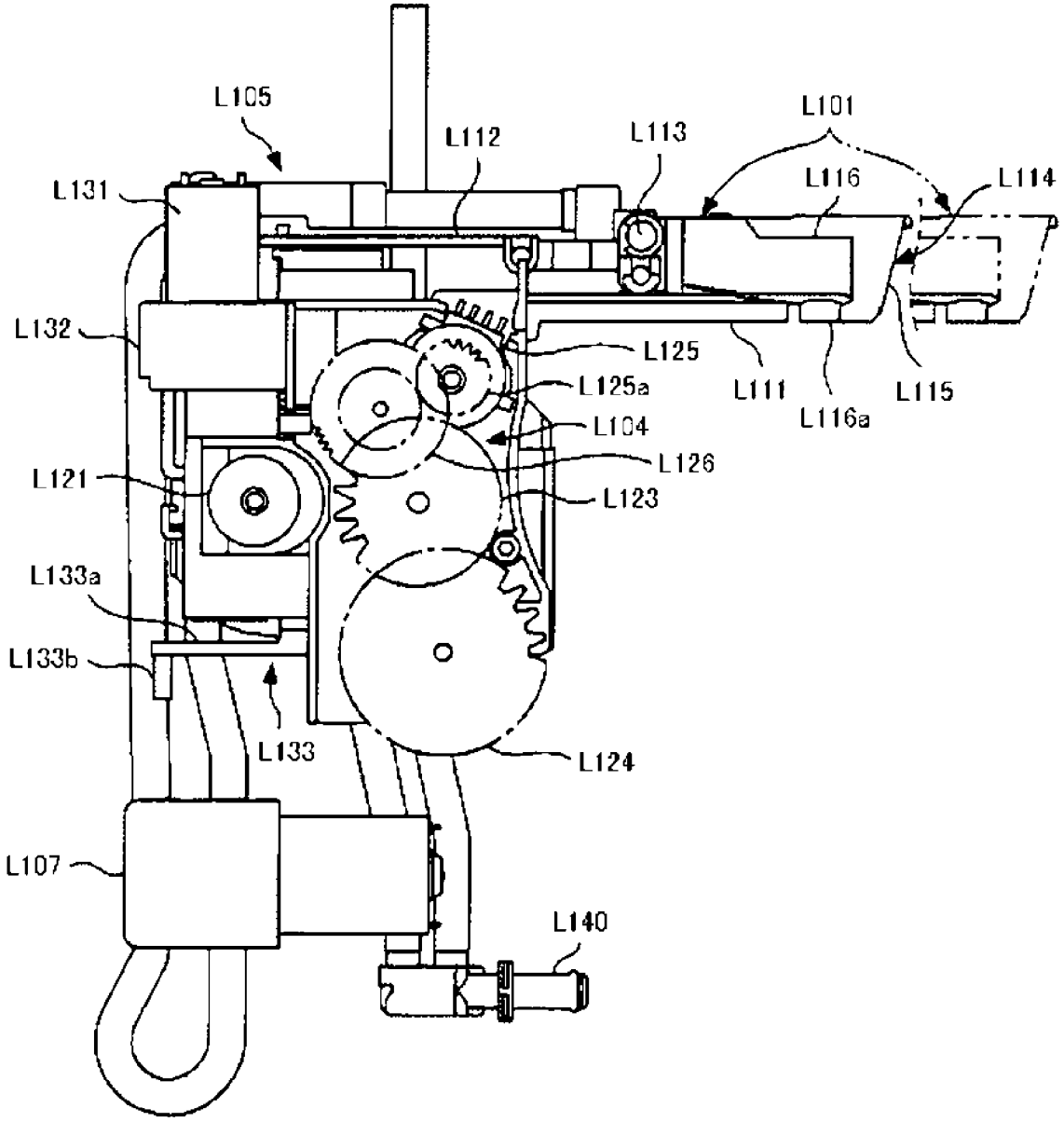


图118

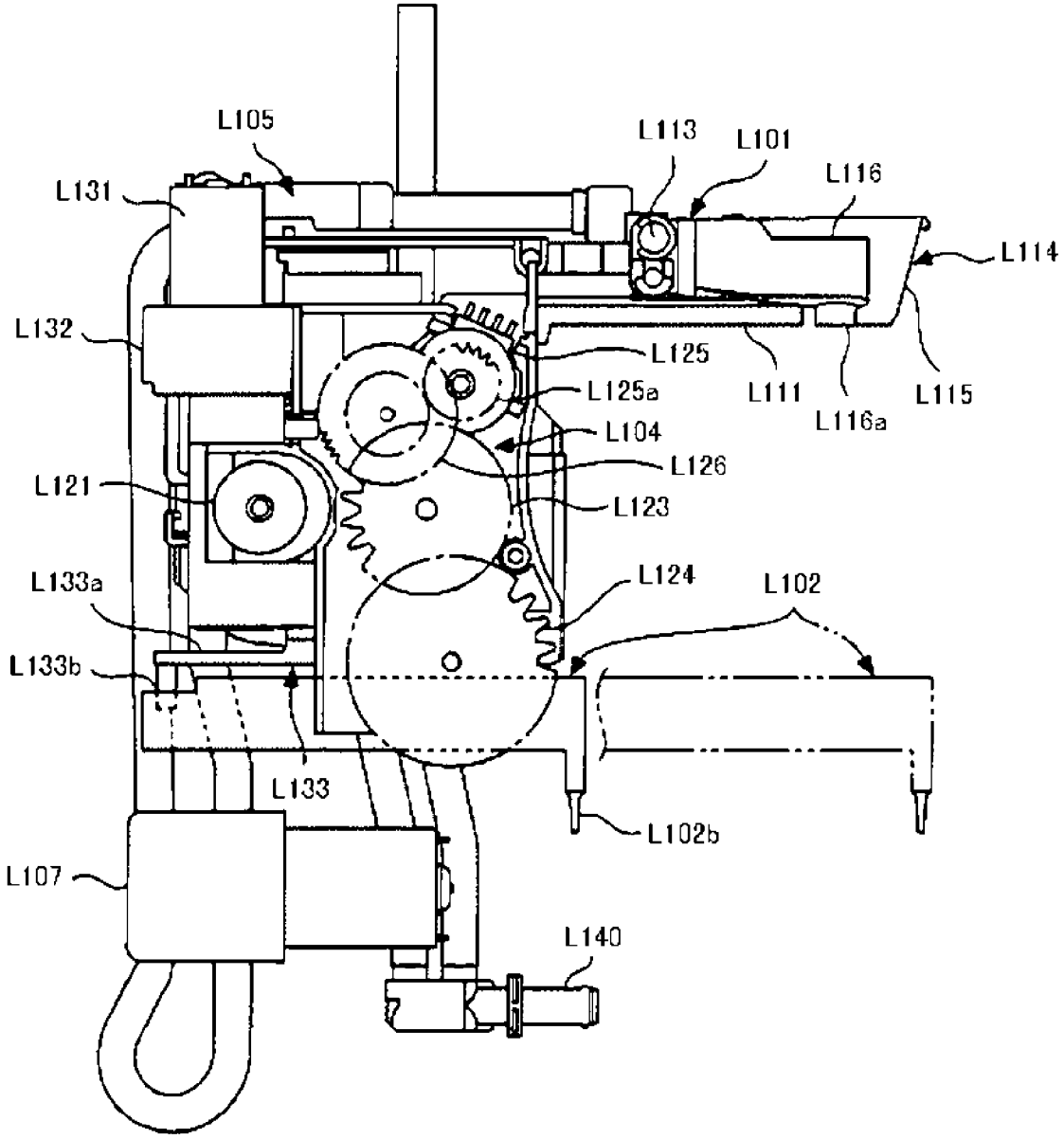


图119

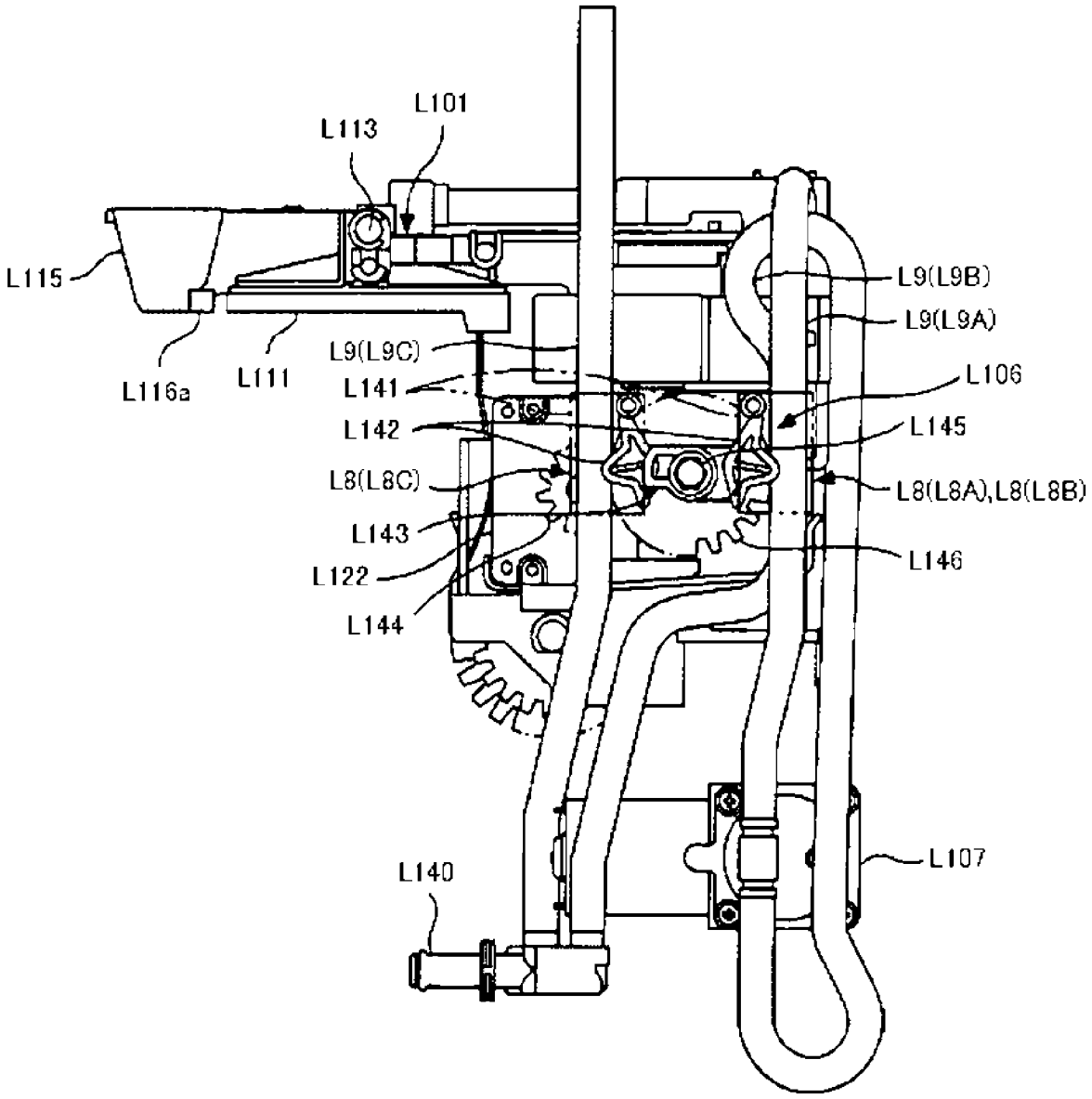


图120

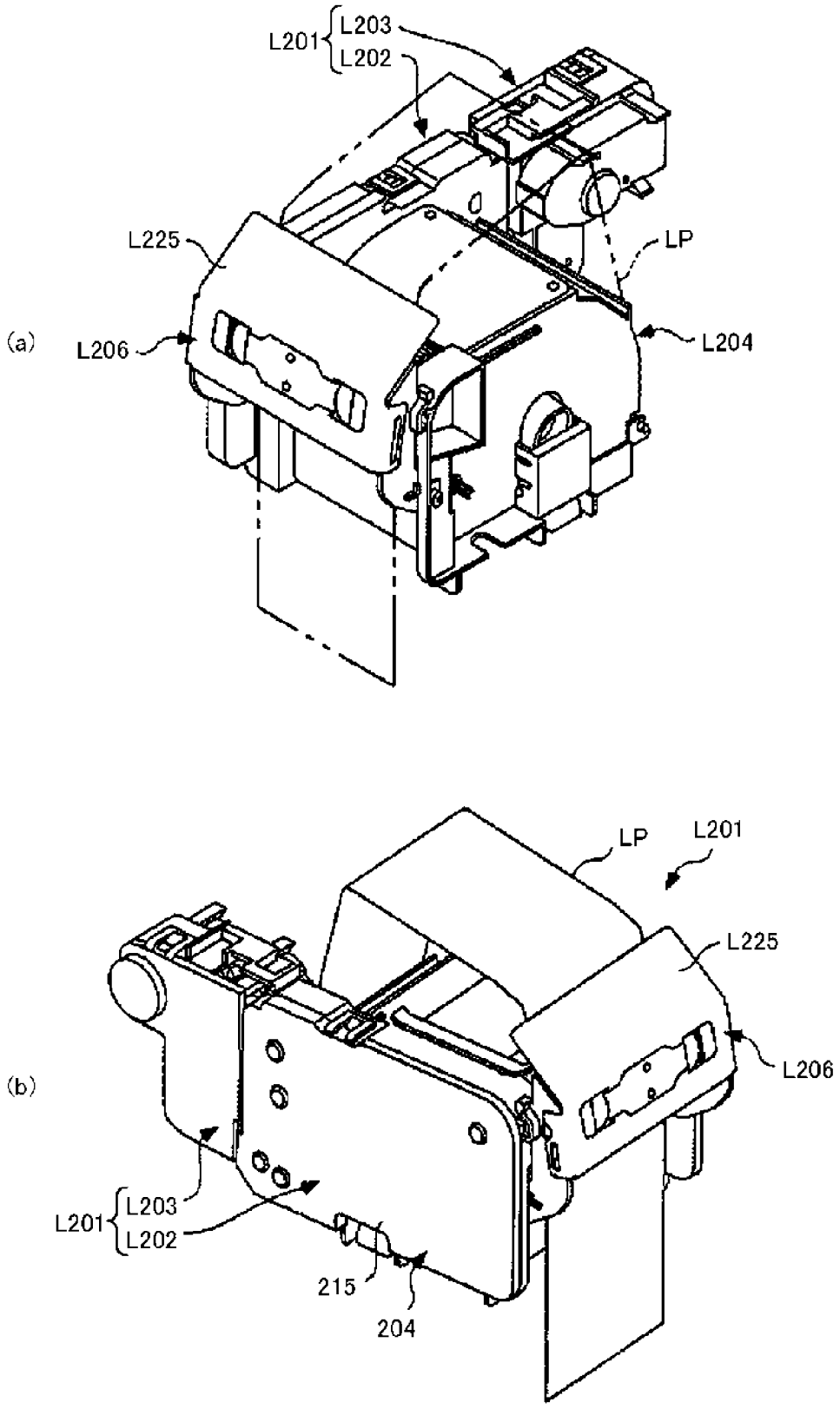


图121

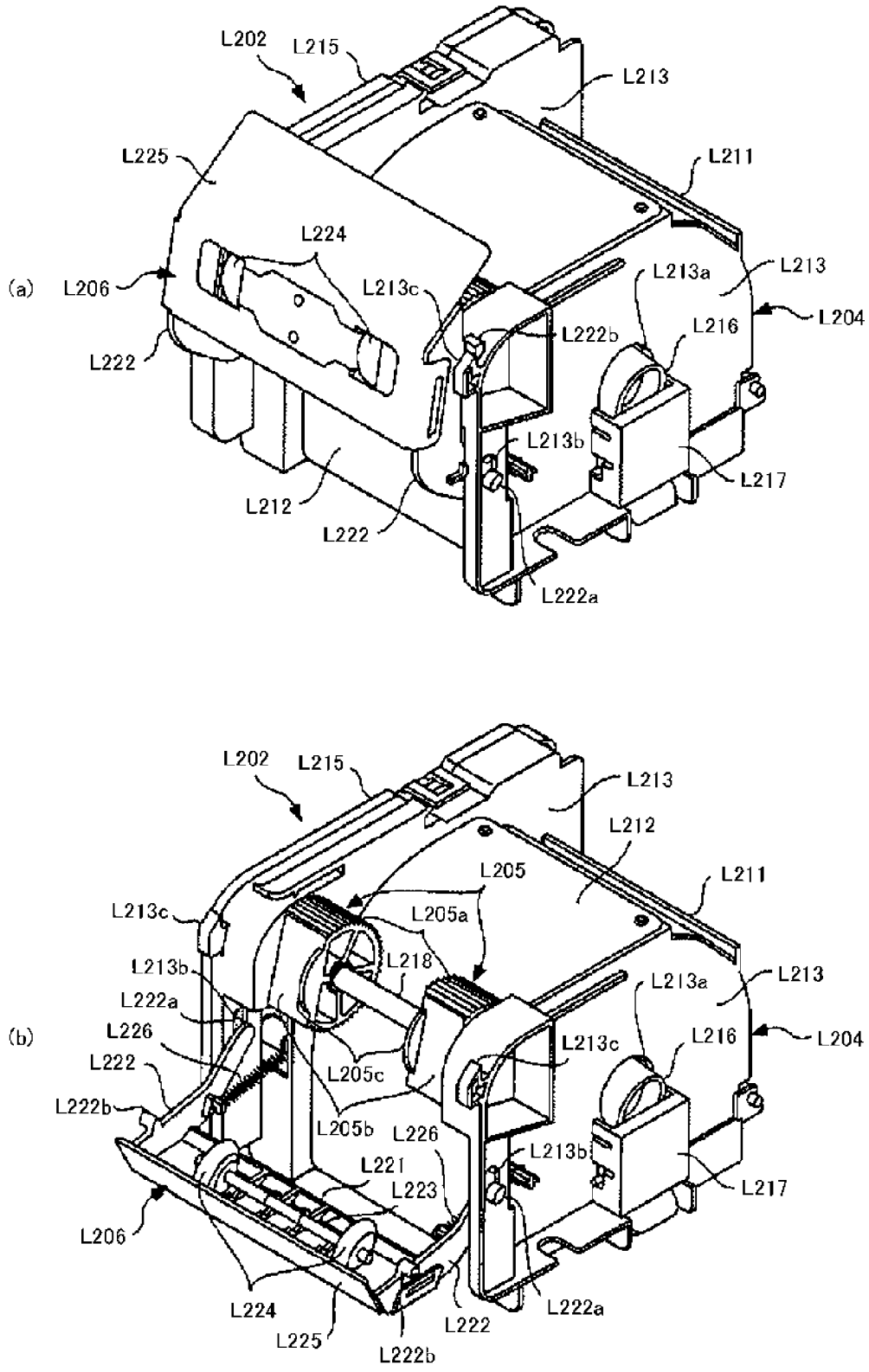


图122

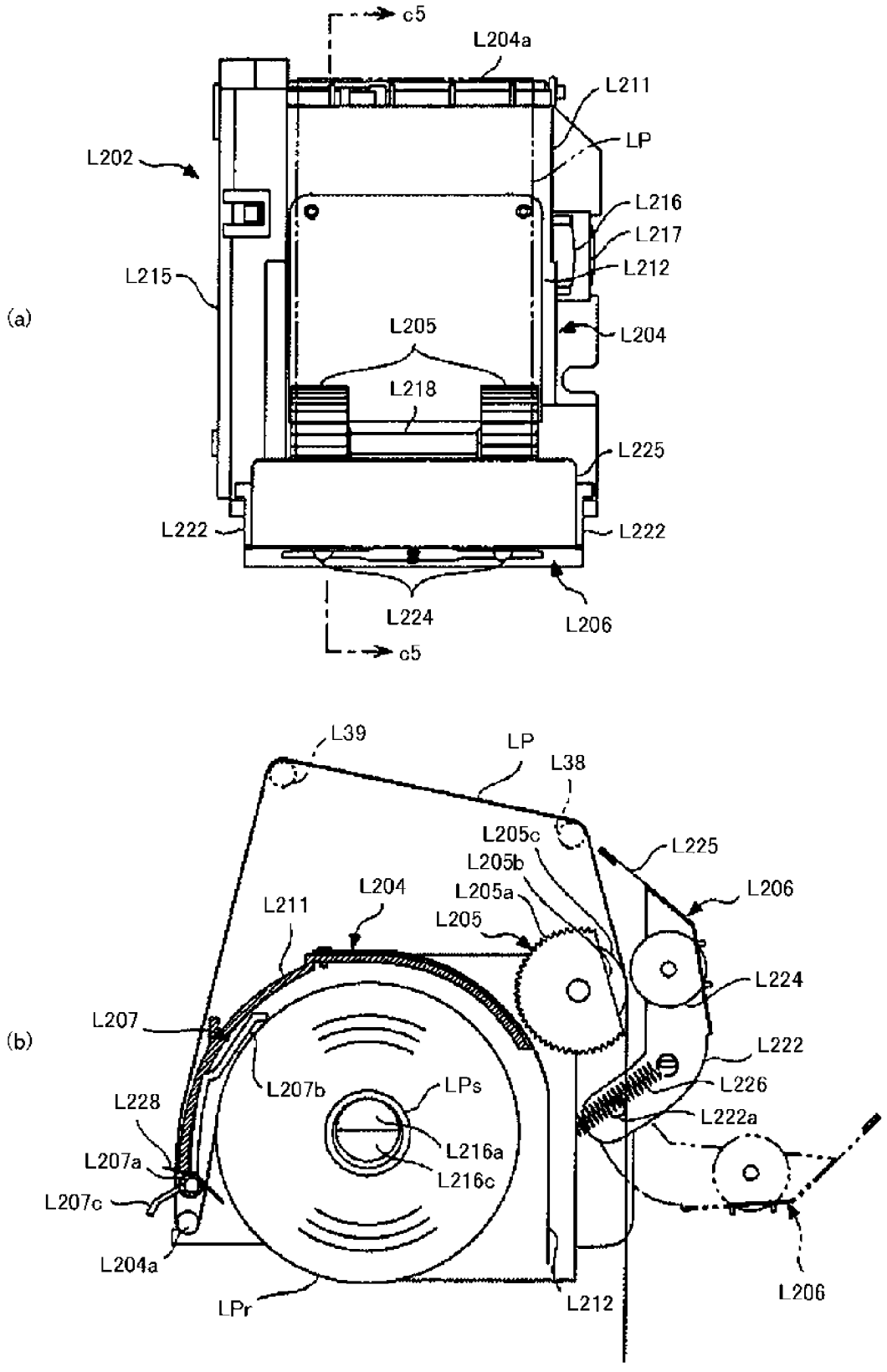


图123

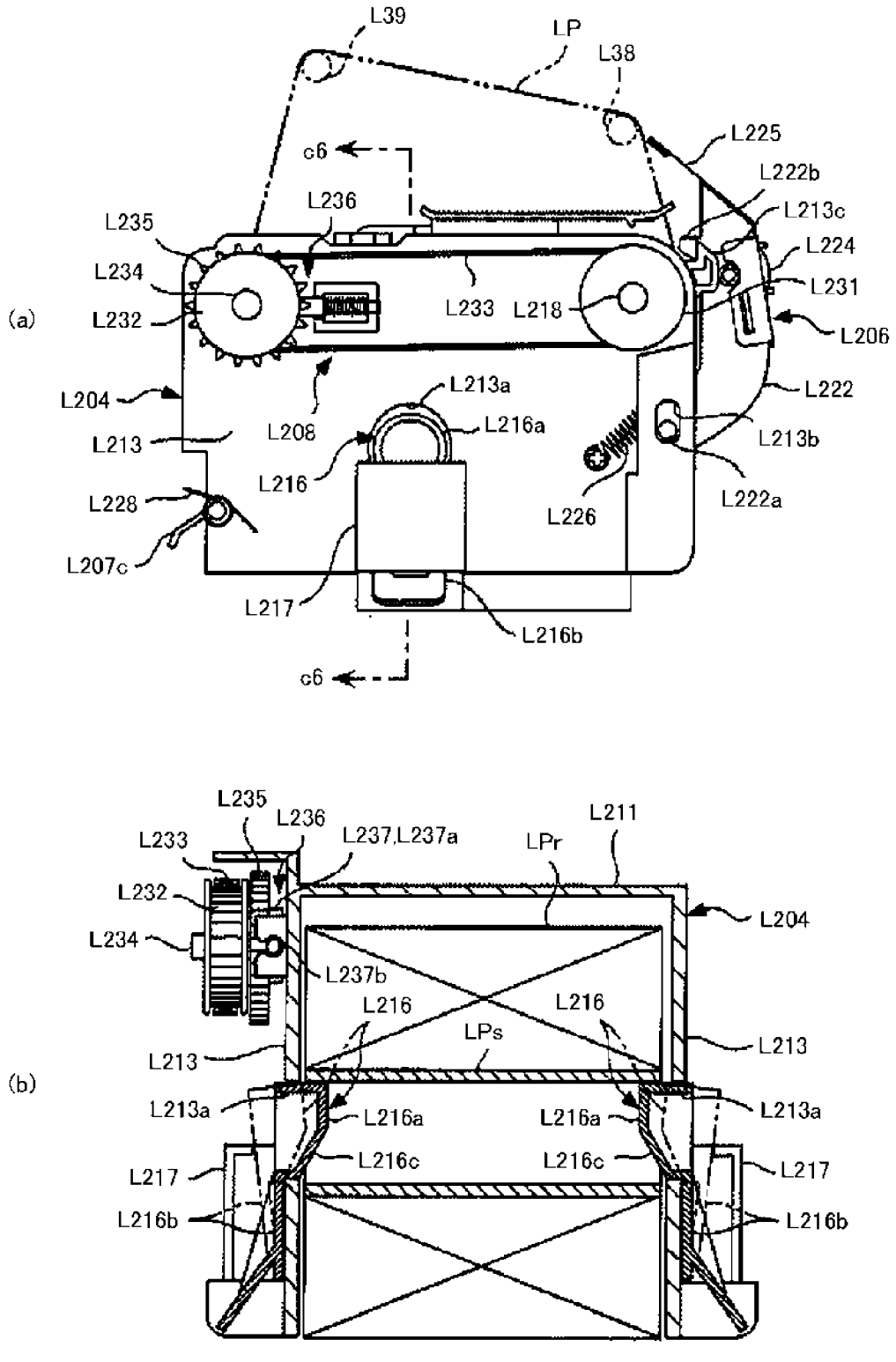


图124

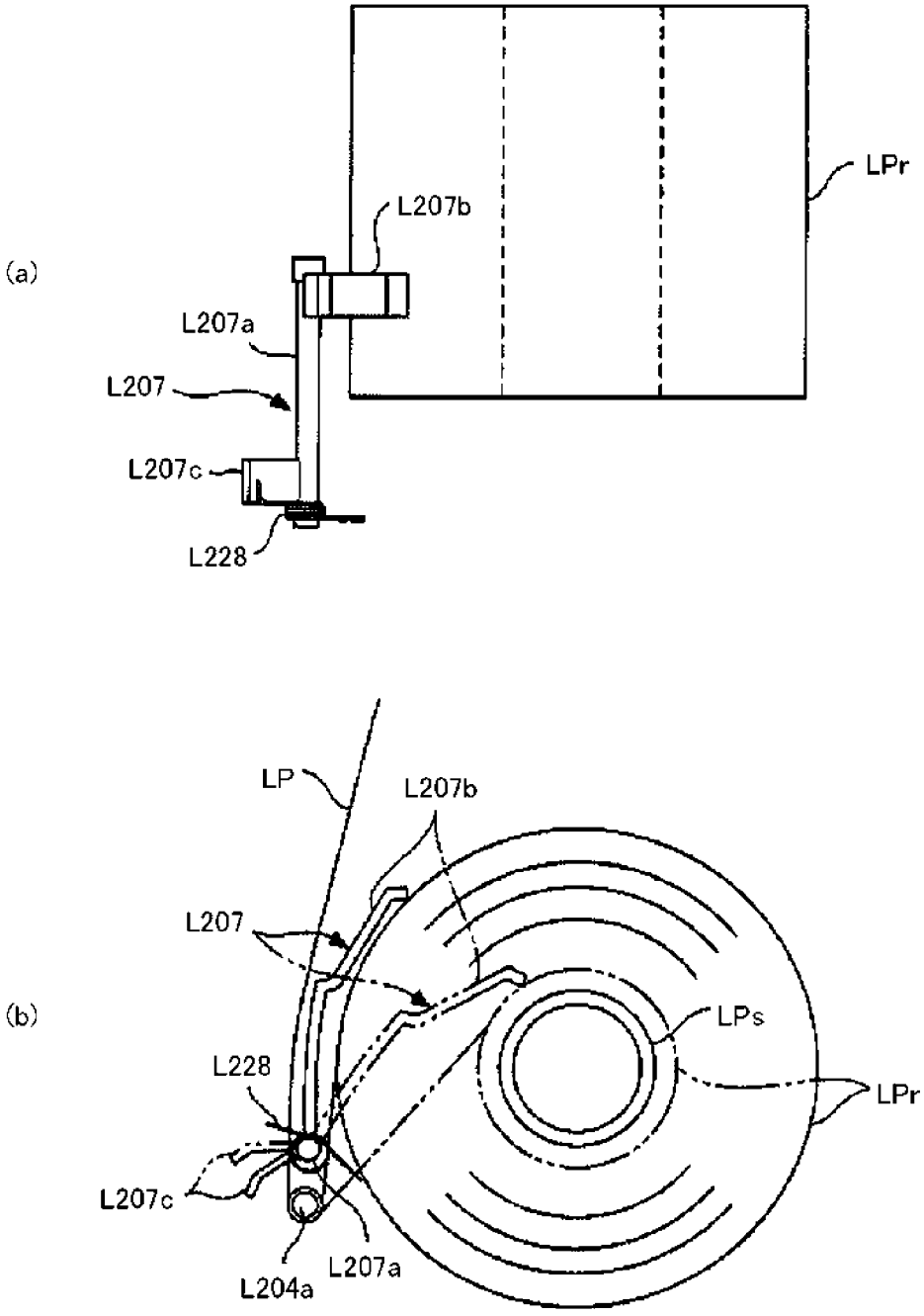


图125

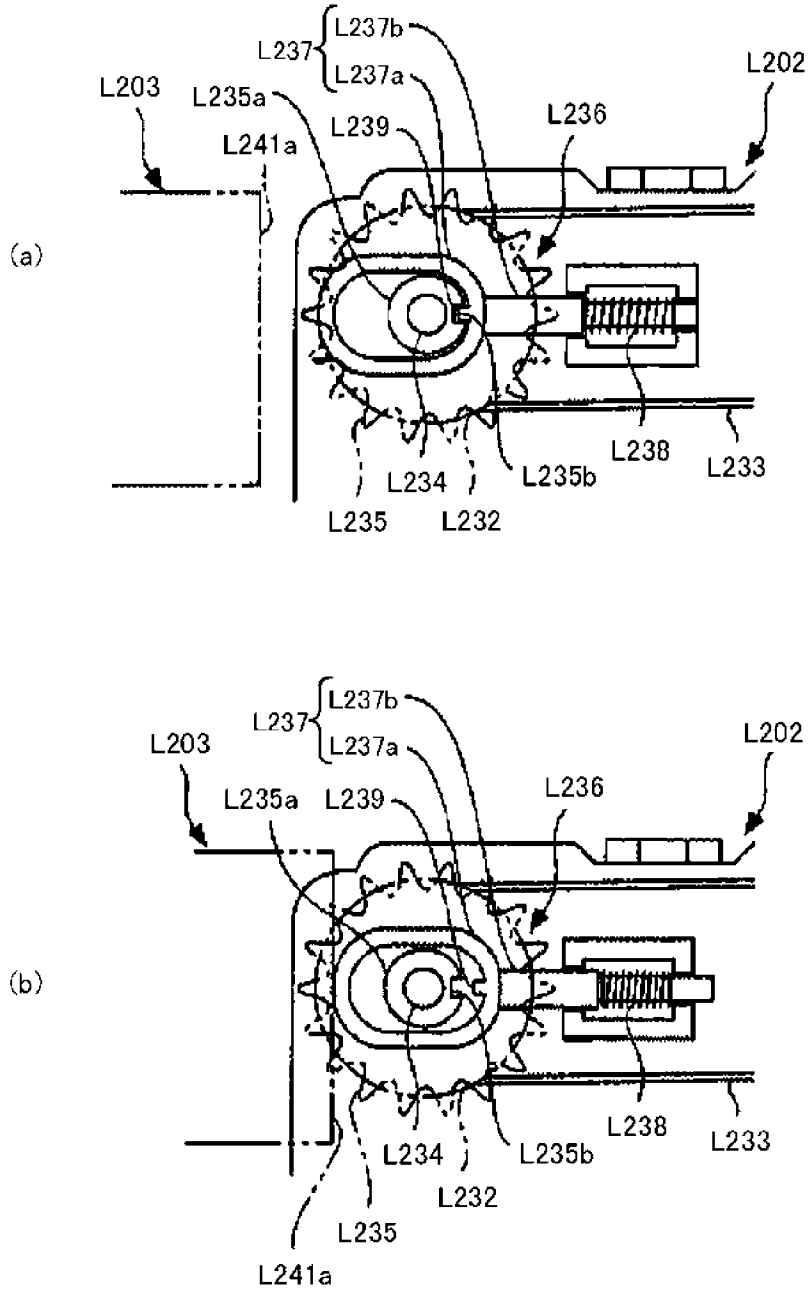


图126

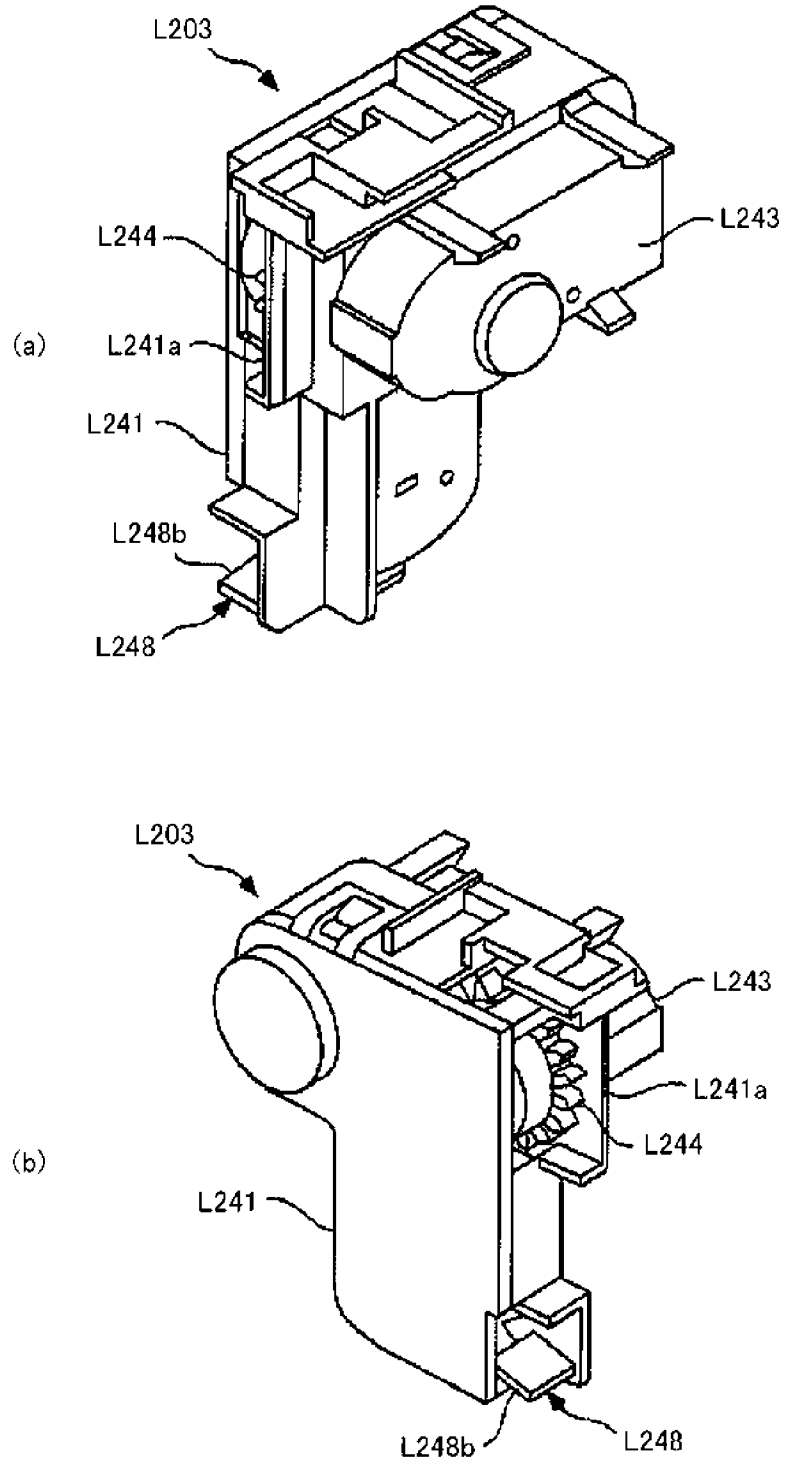


图127

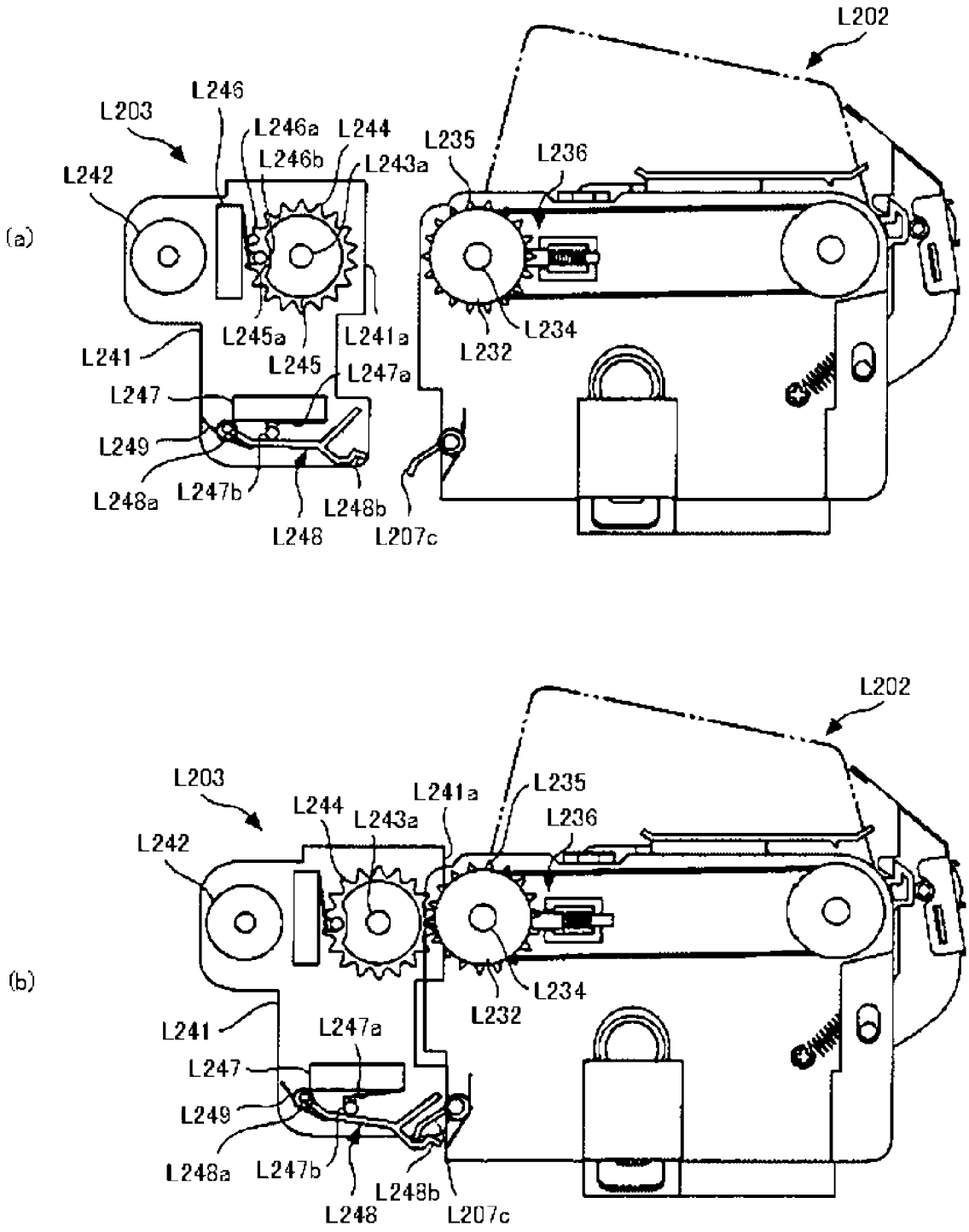


图128

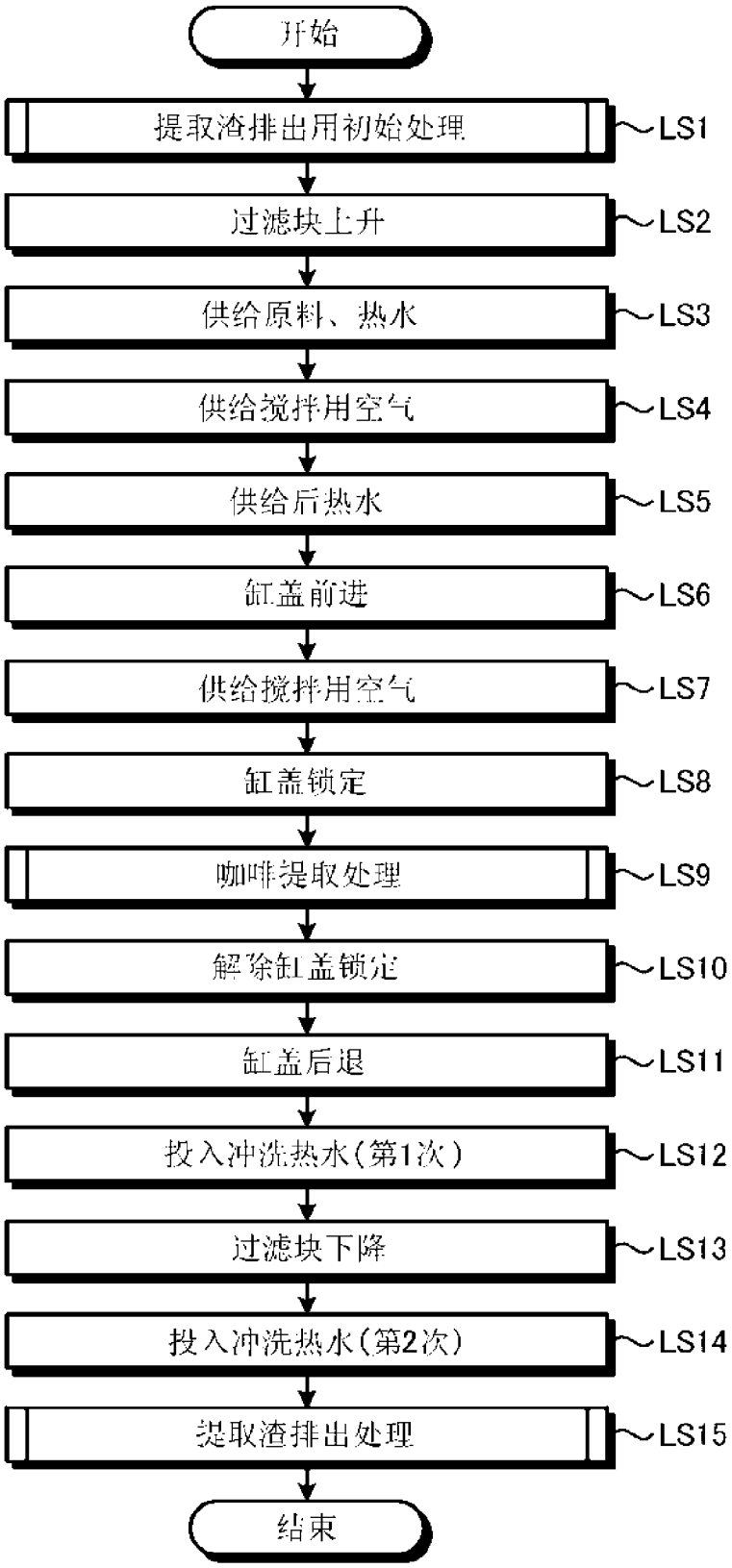


图129

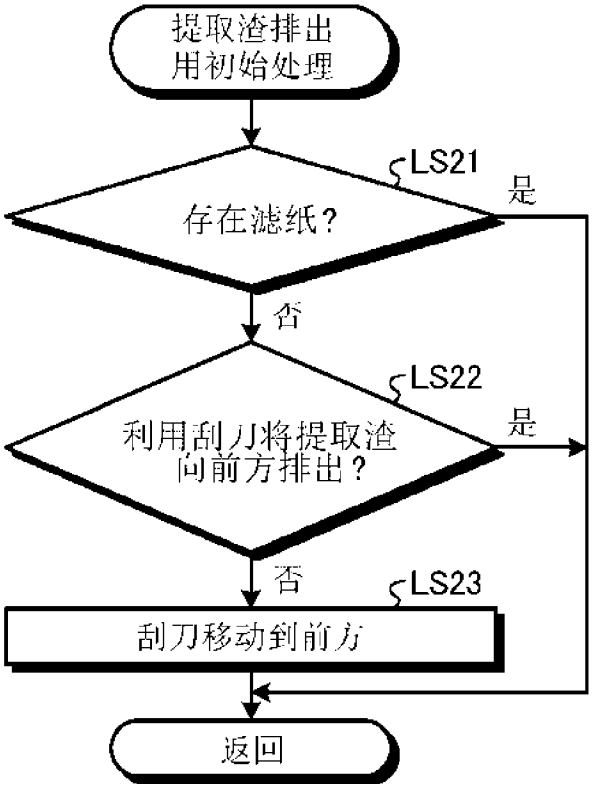


图130

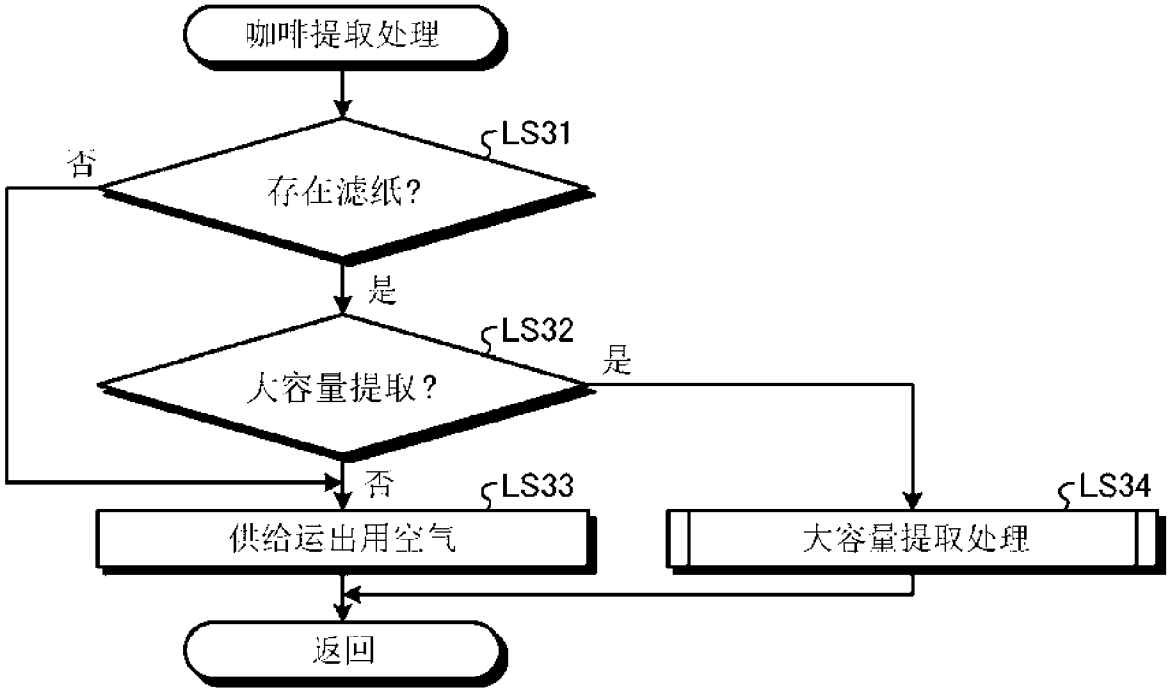


图131

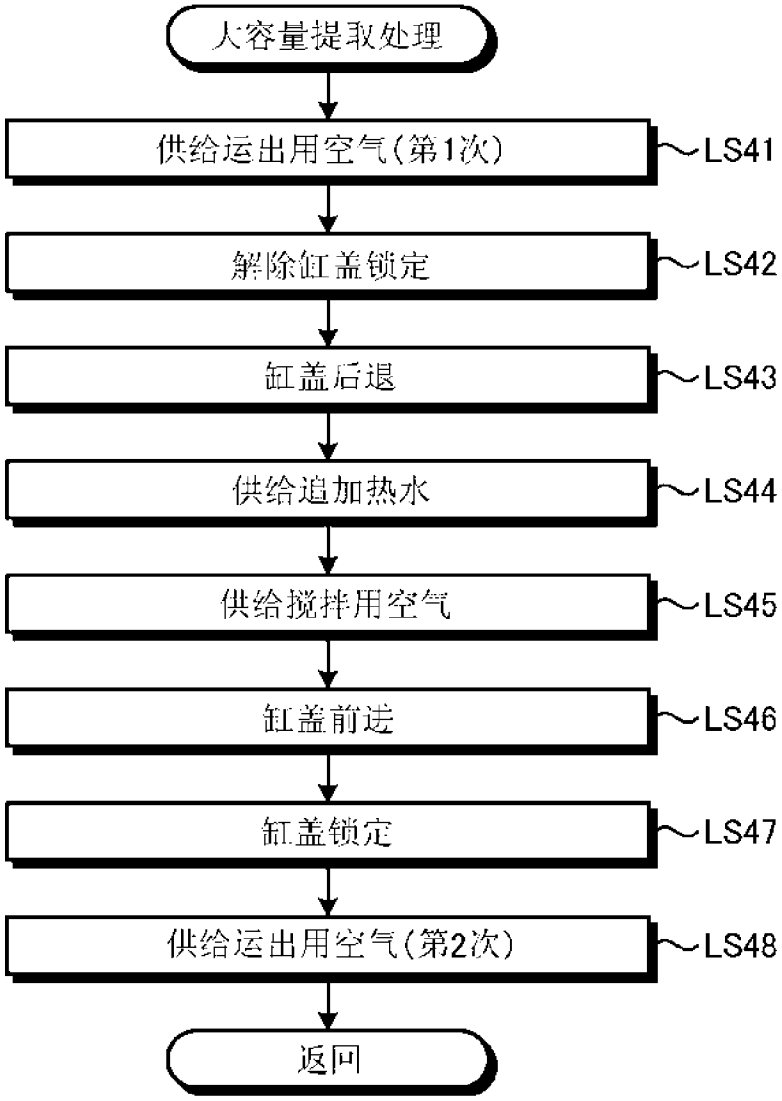


图132

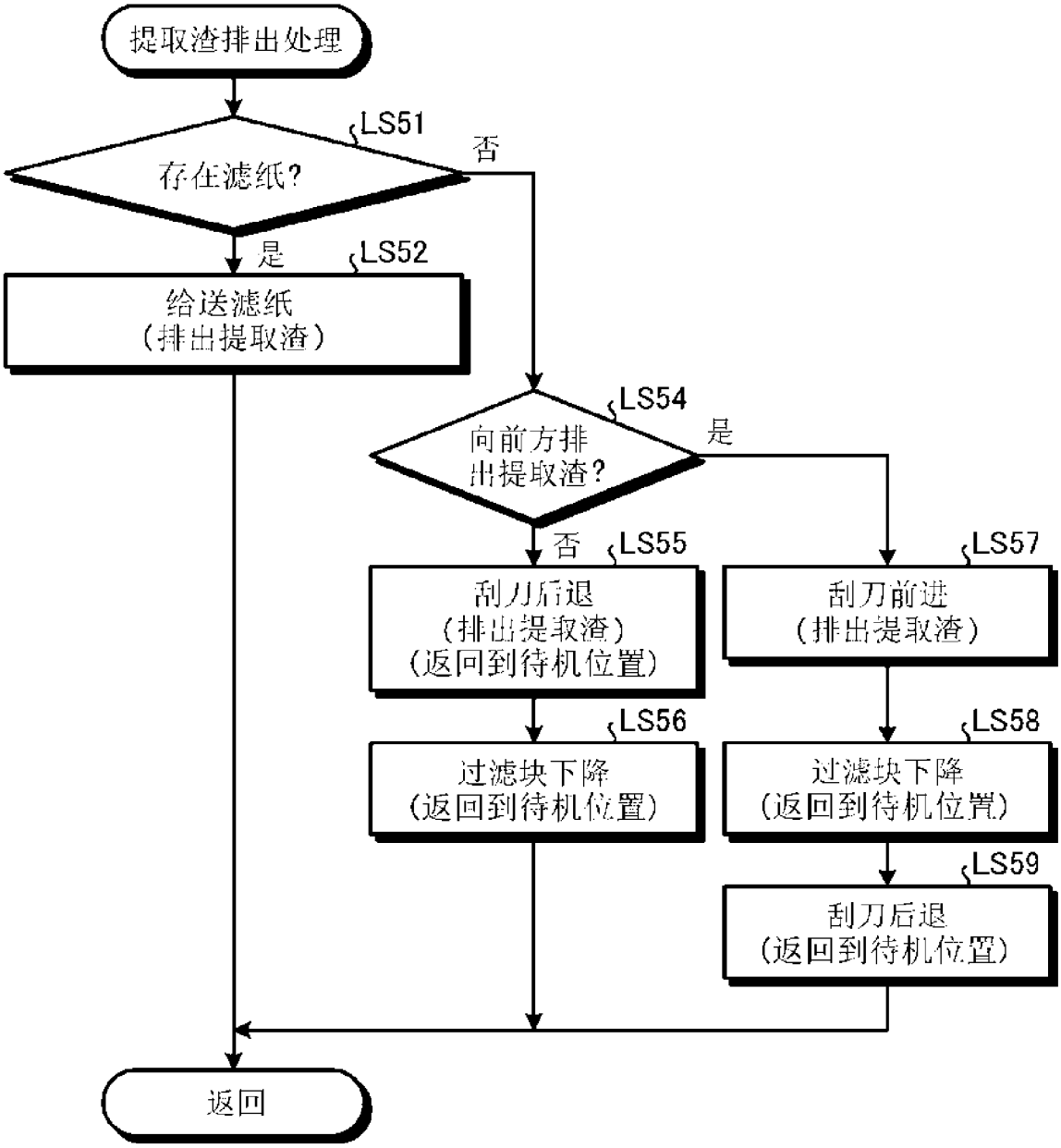


图133

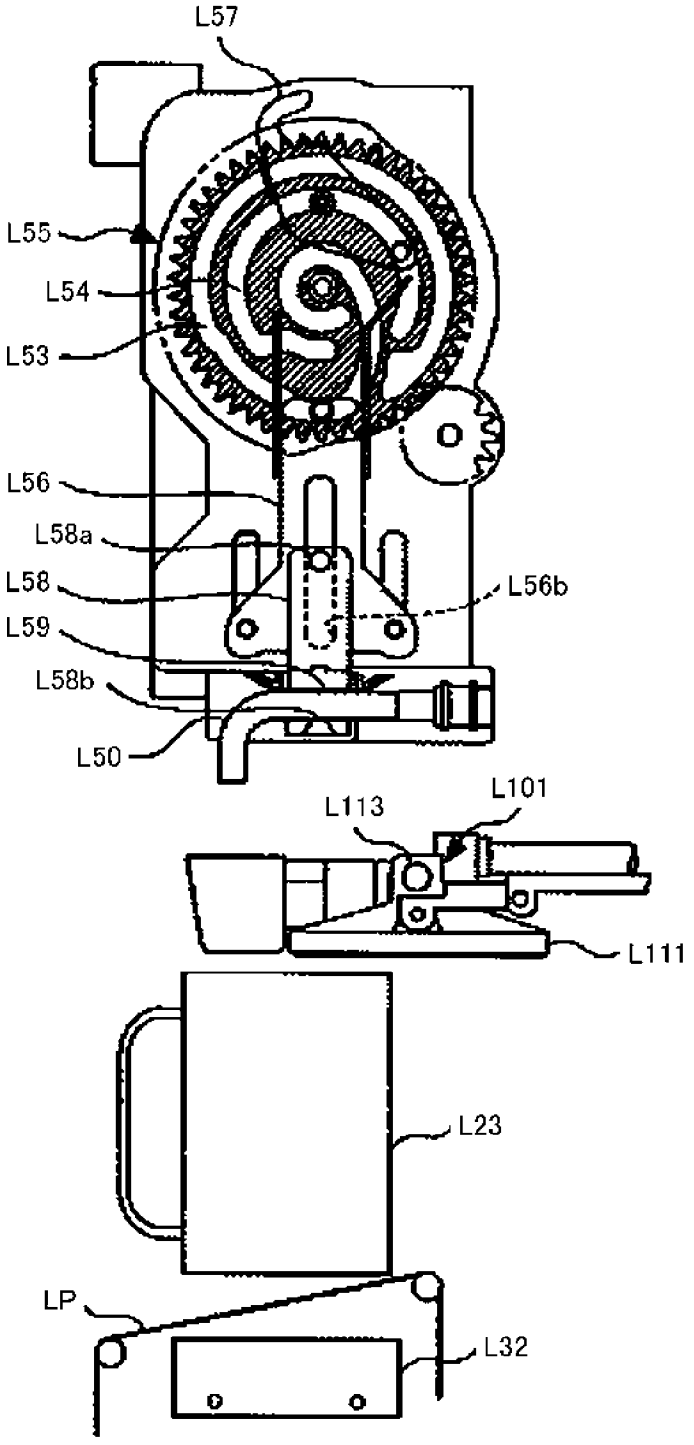


图134

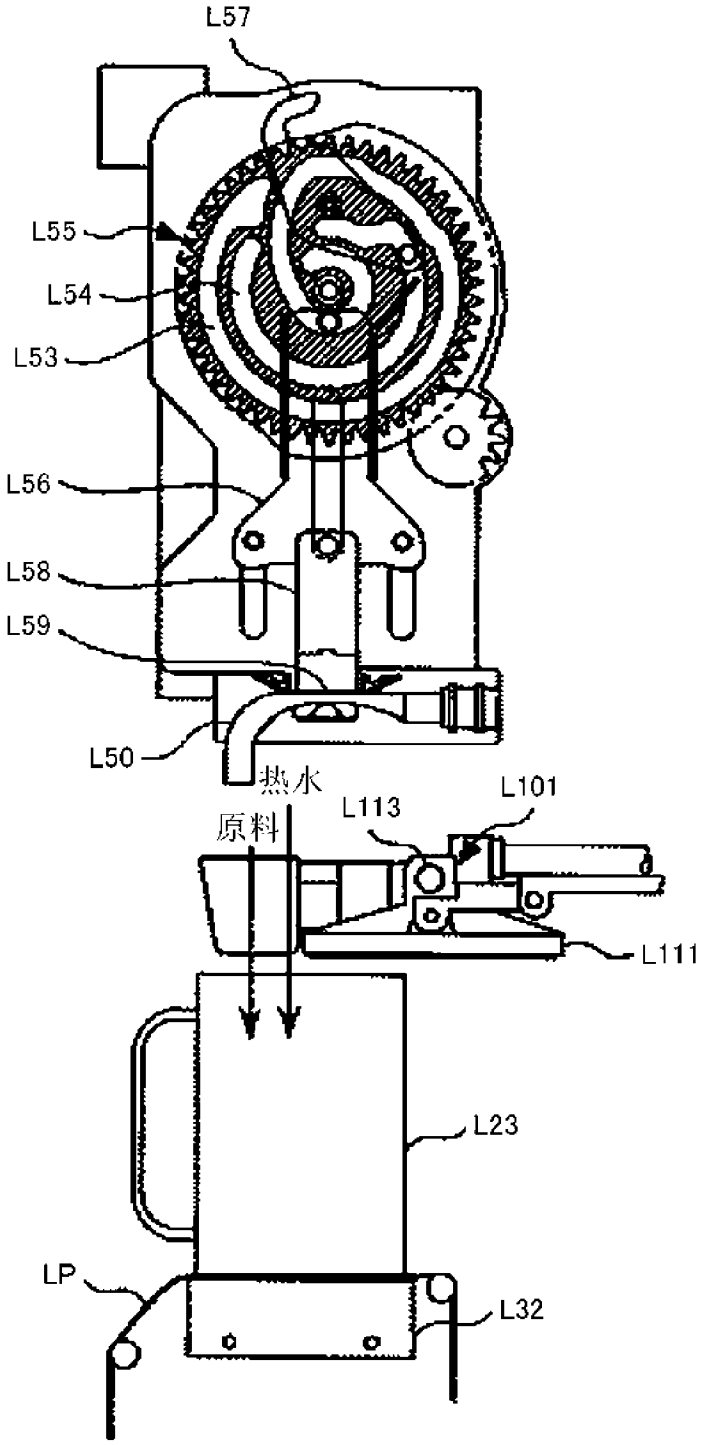


图135

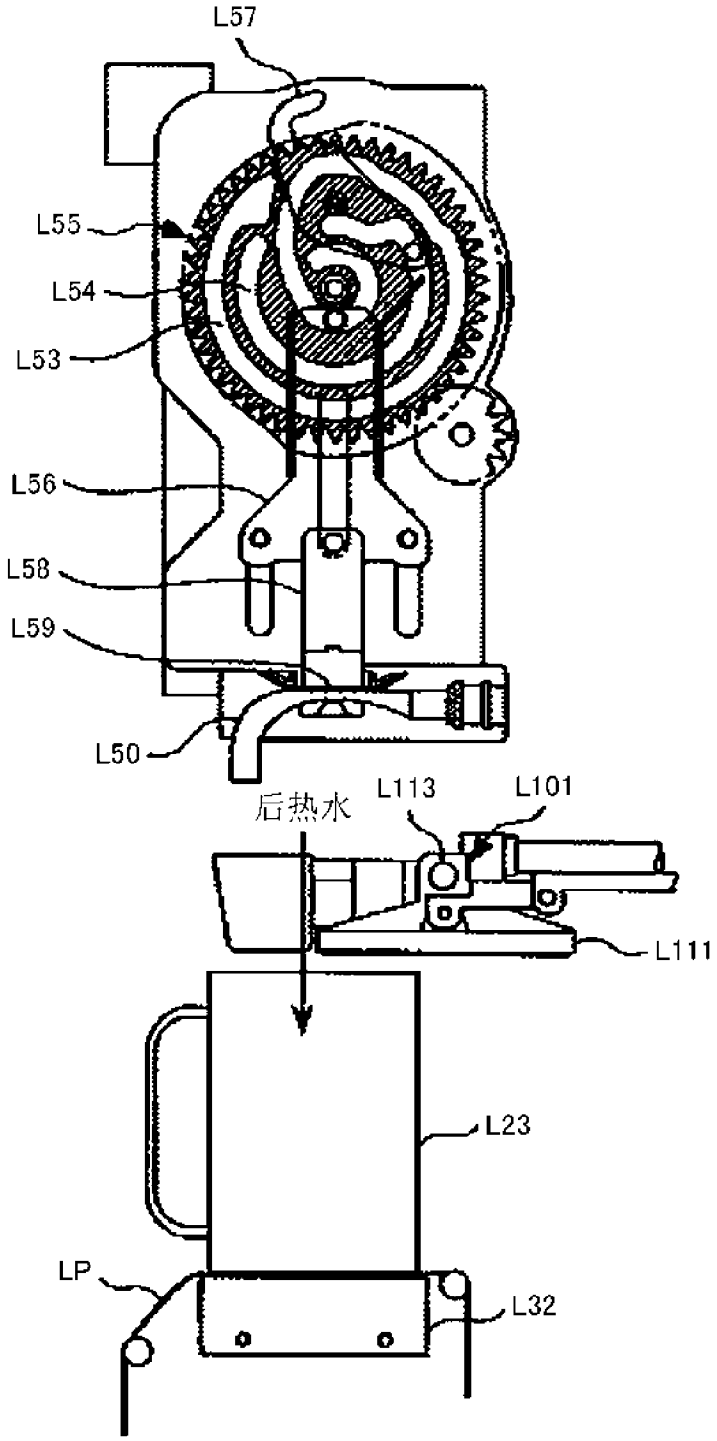


图136

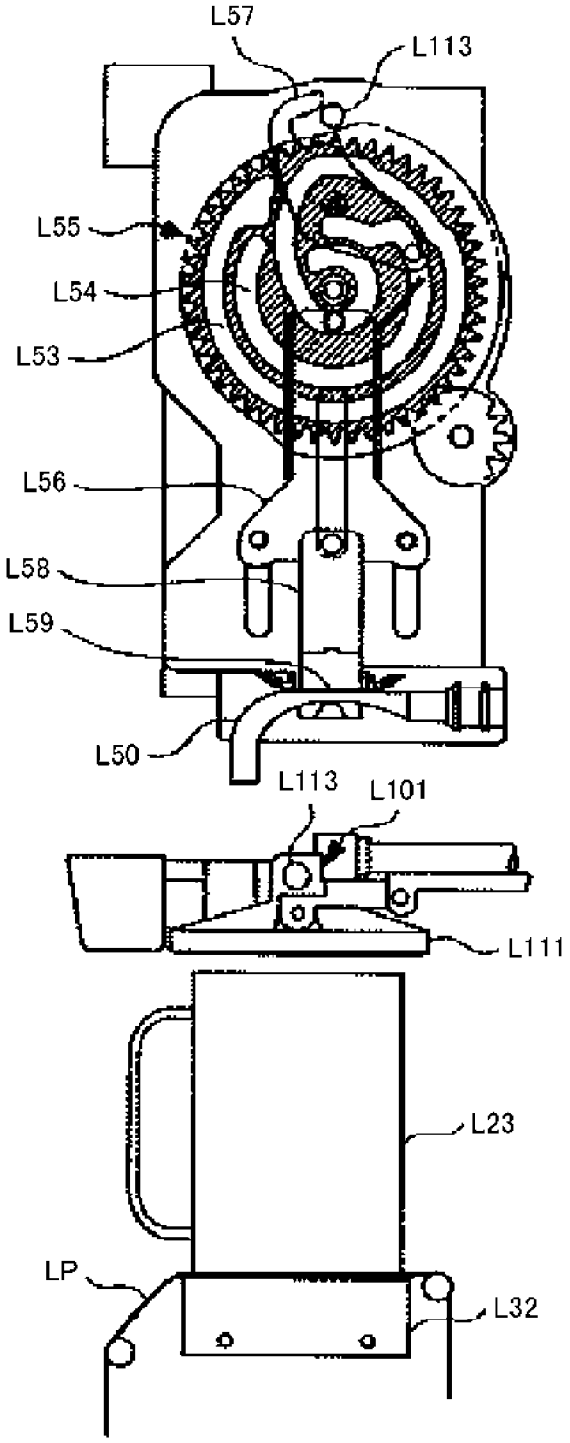


图137

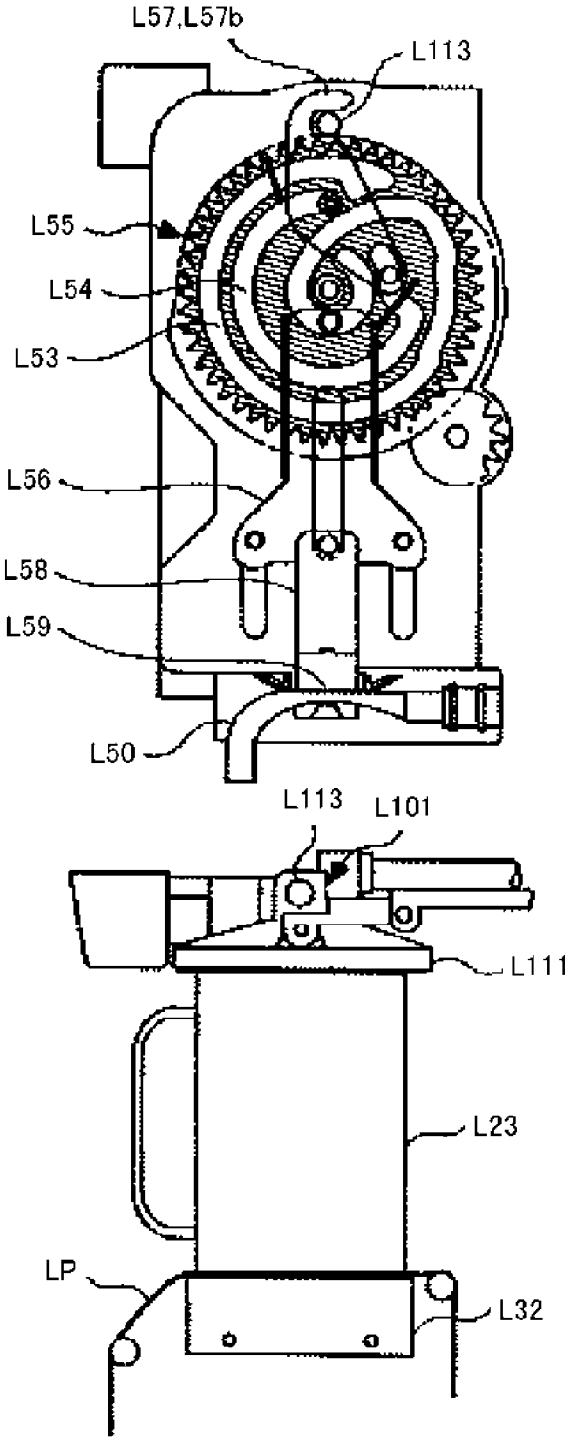


图138

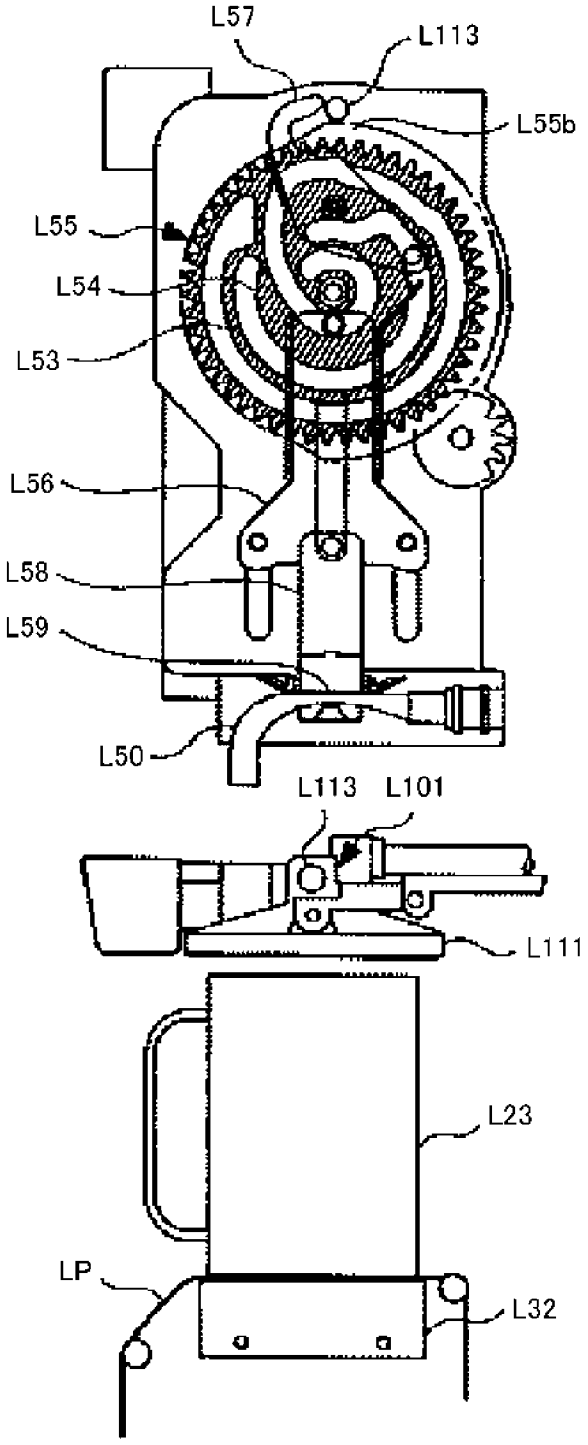


图139

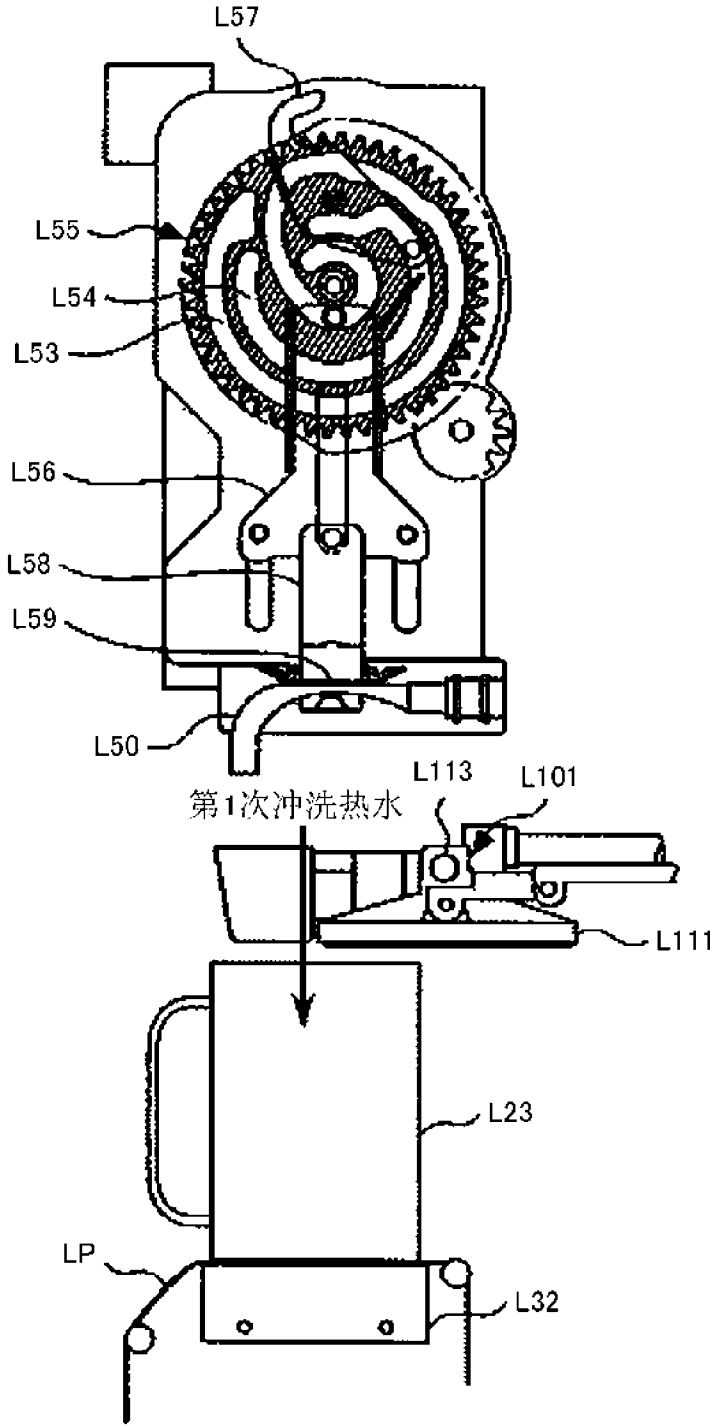


图140

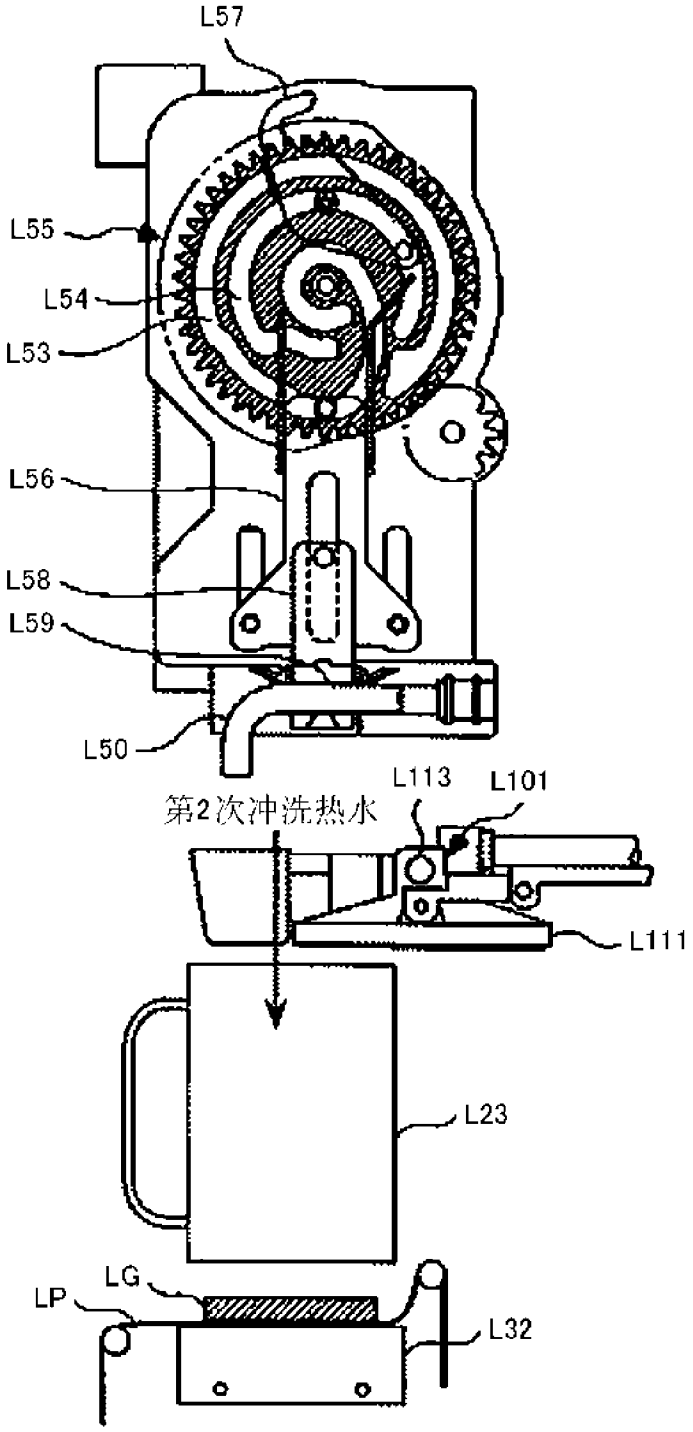


图141

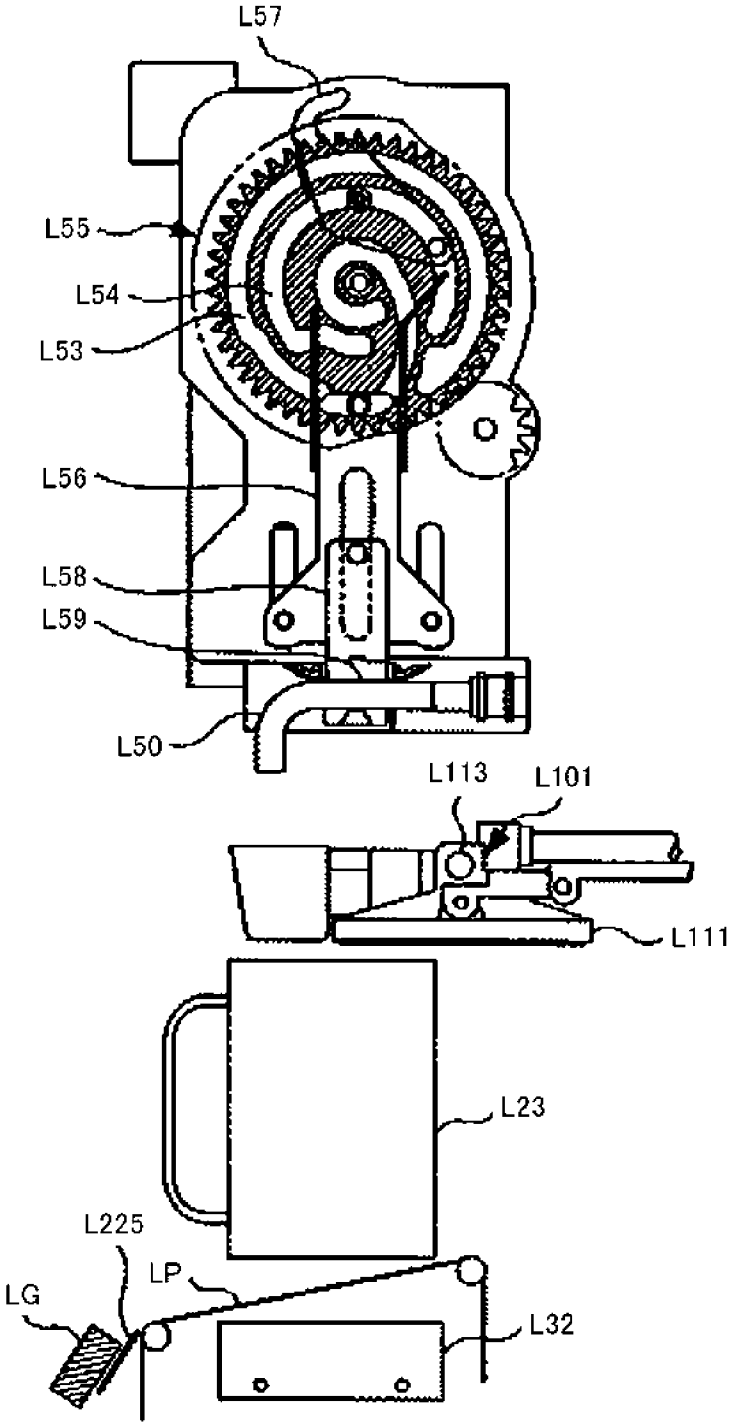


图142

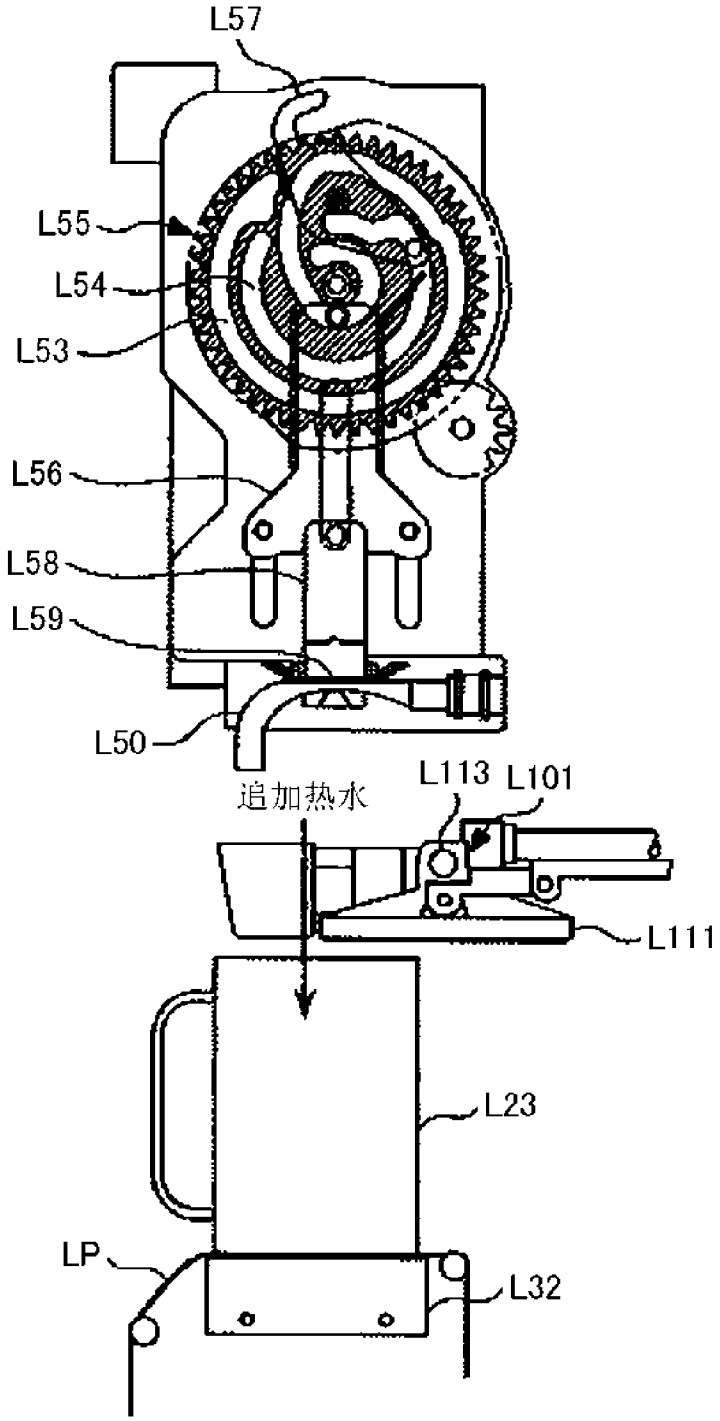


图143

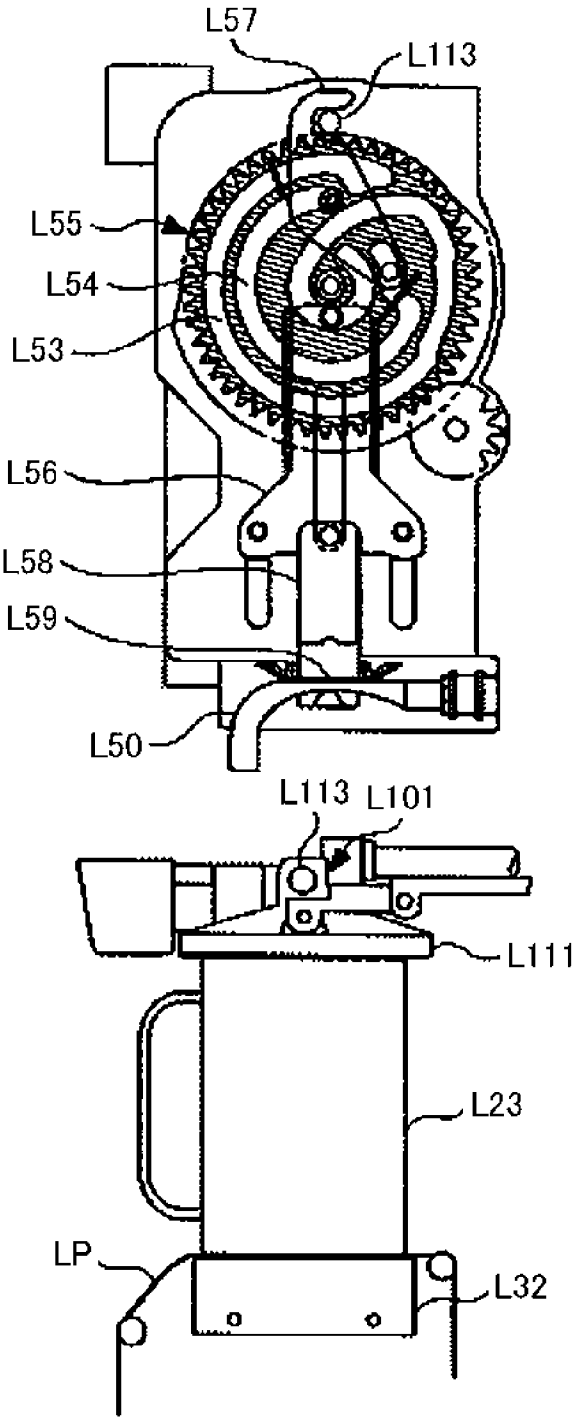


图144

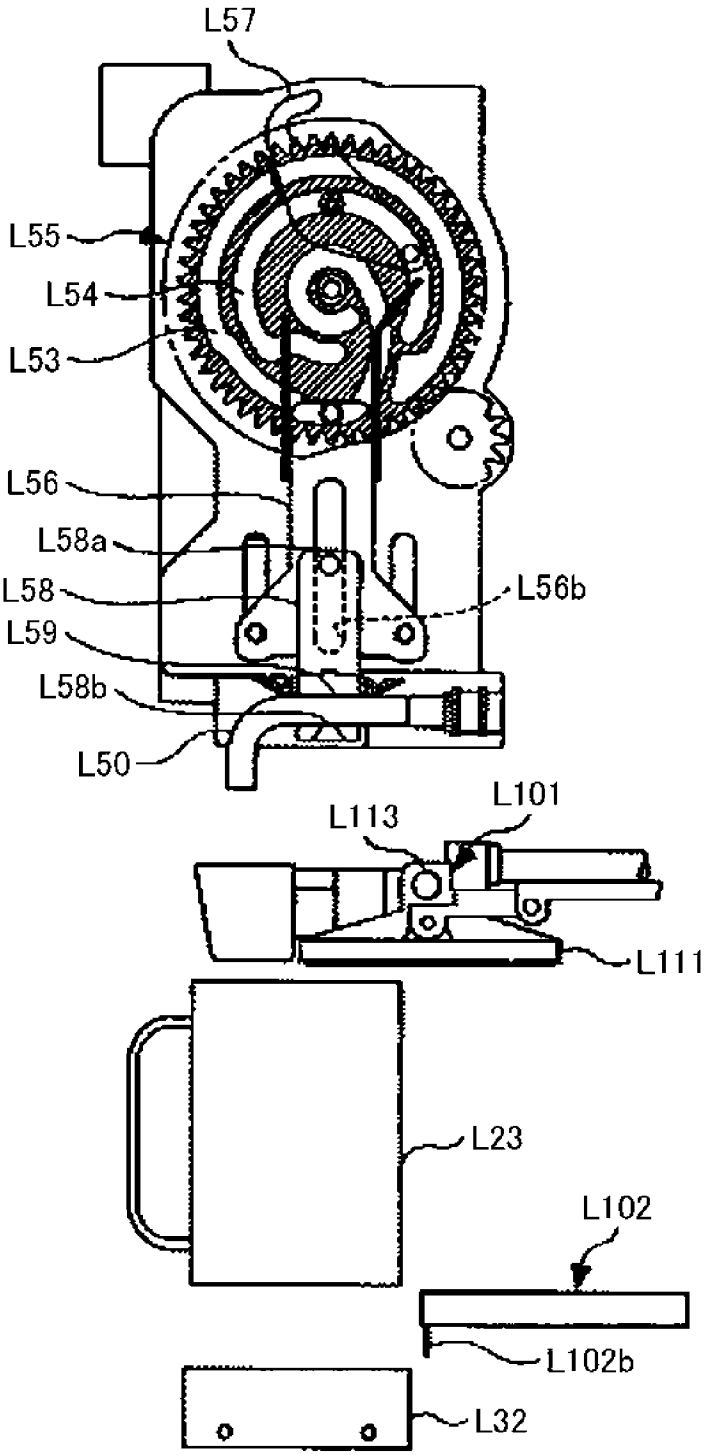


图145

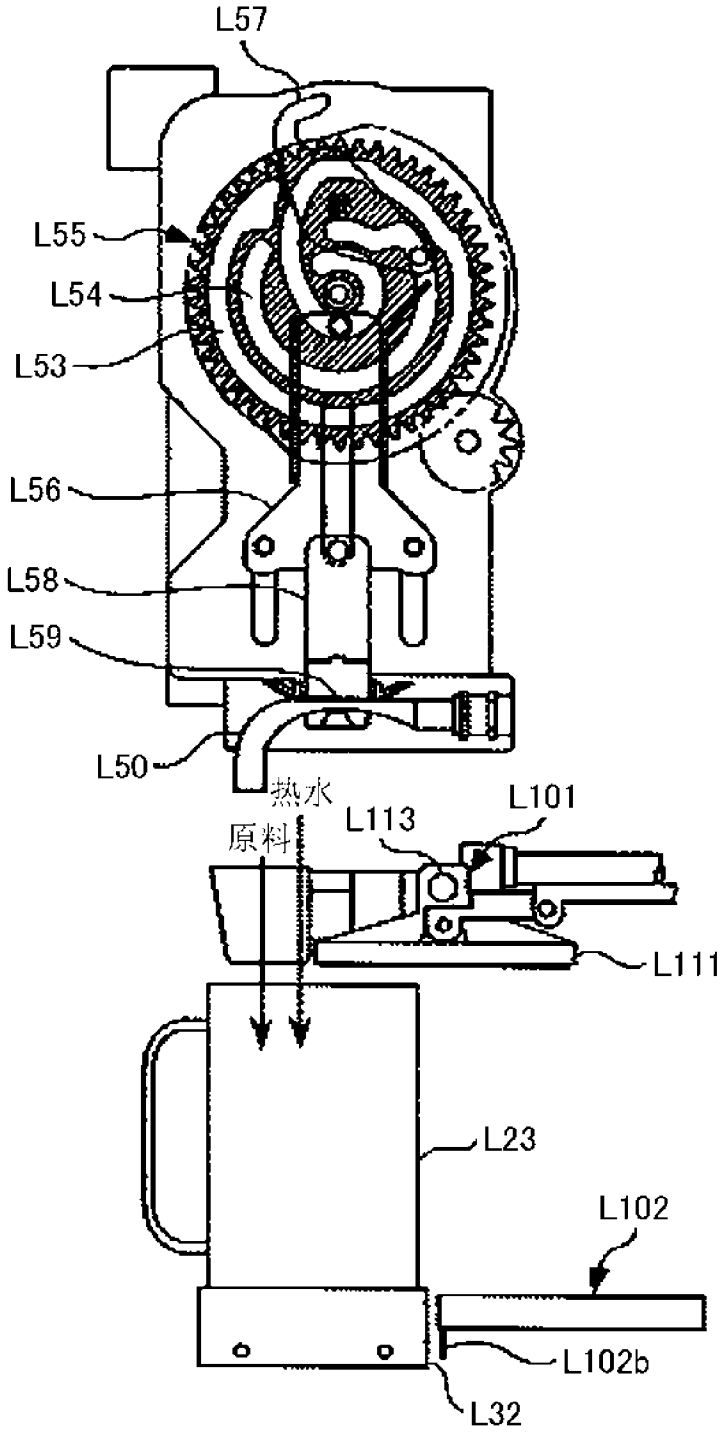


图146

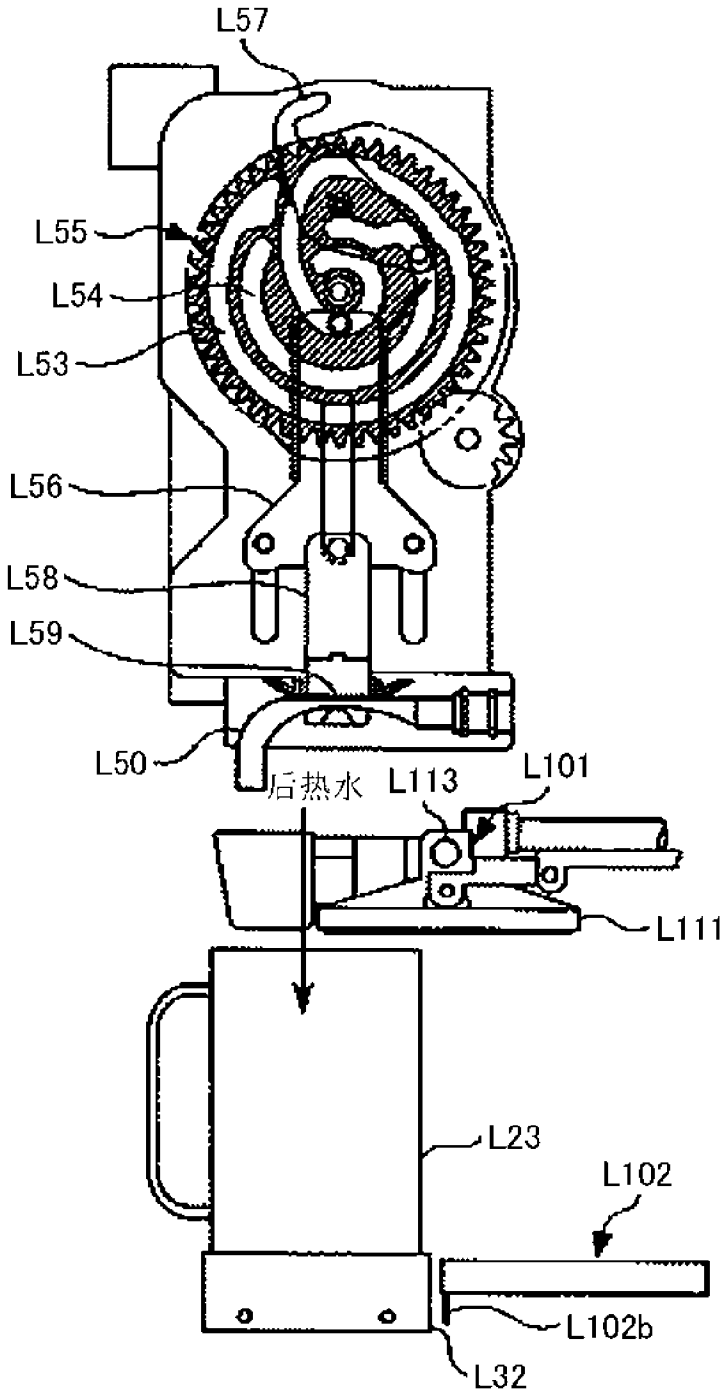


图147

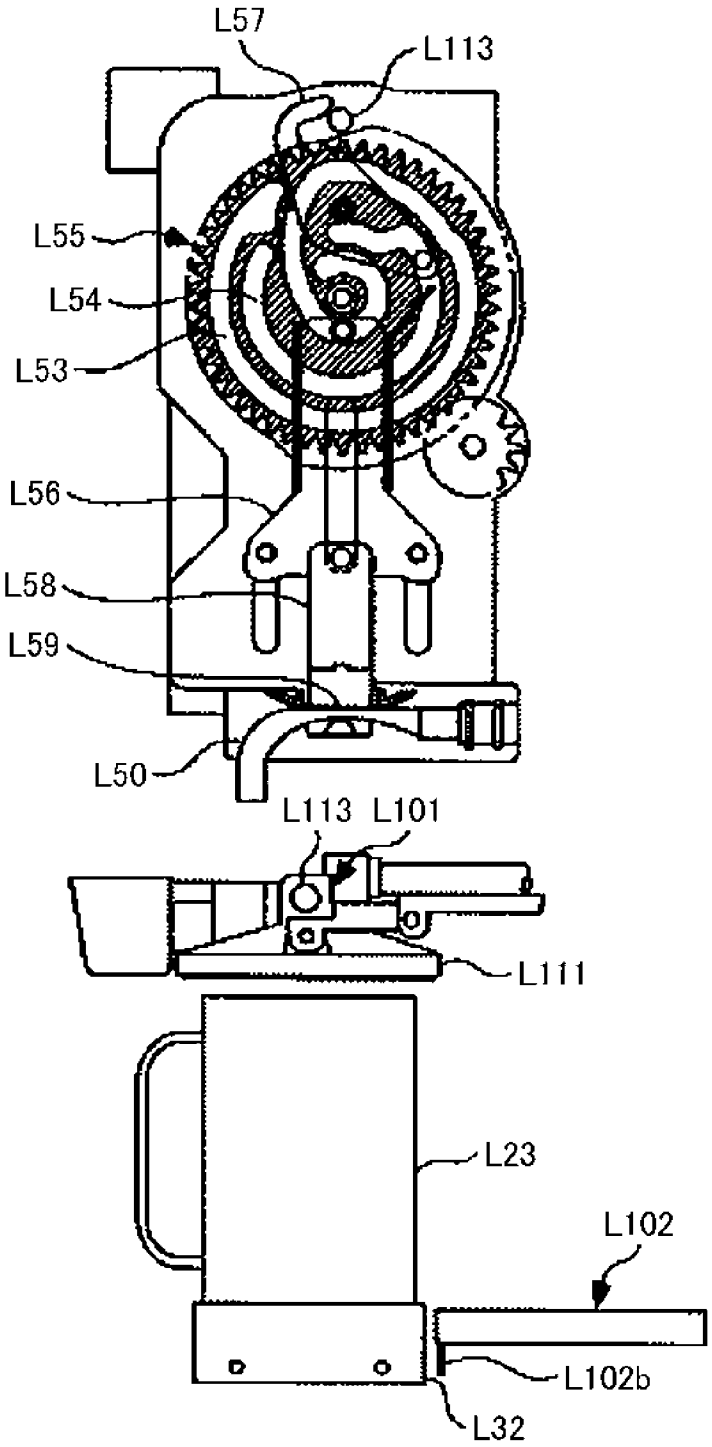


图148

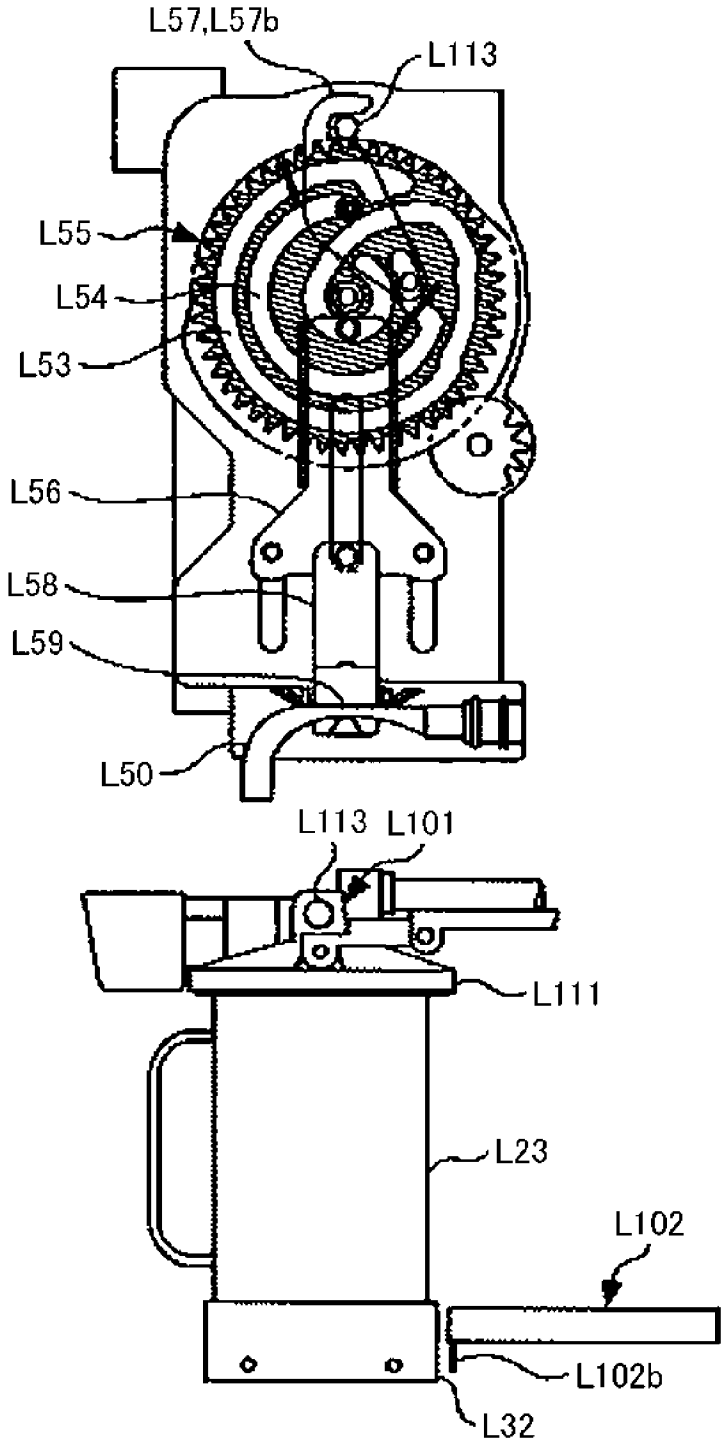


图149

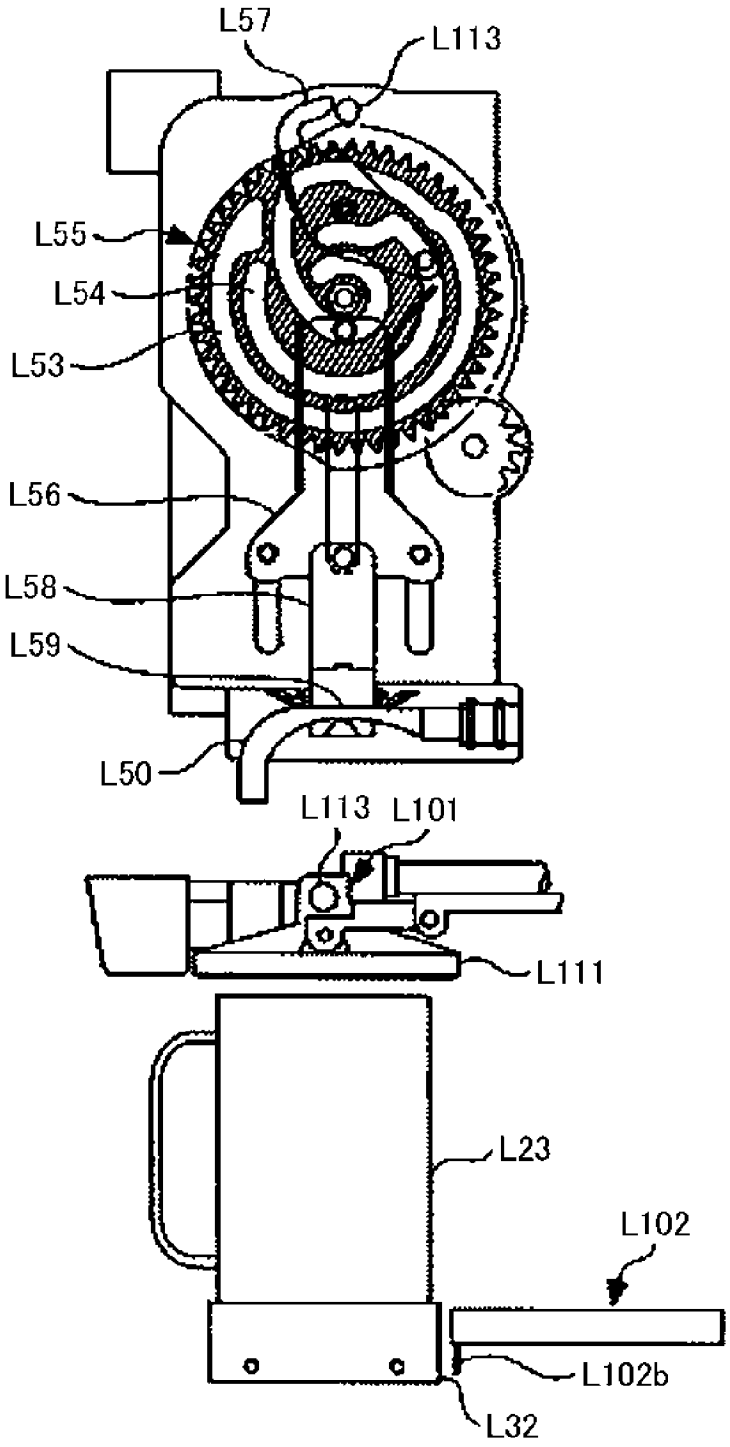


图150

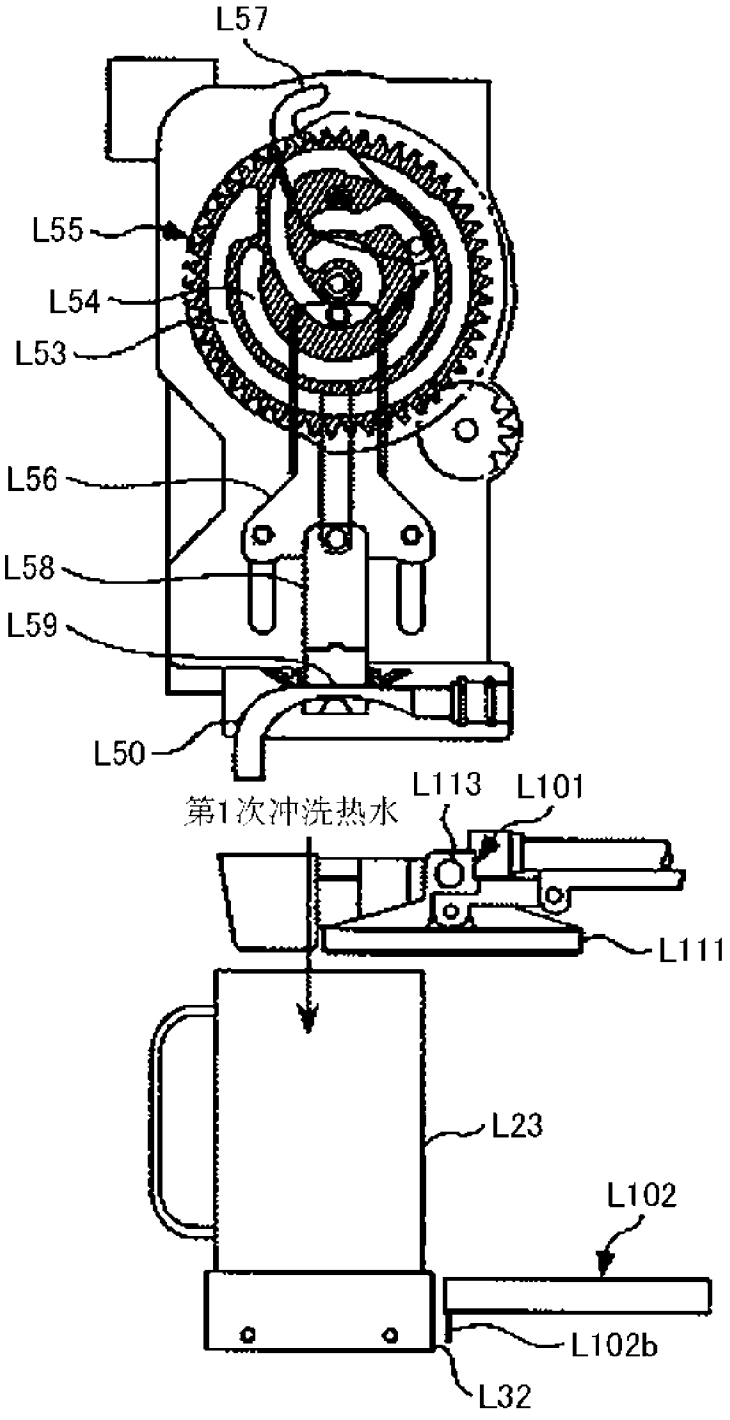


图151

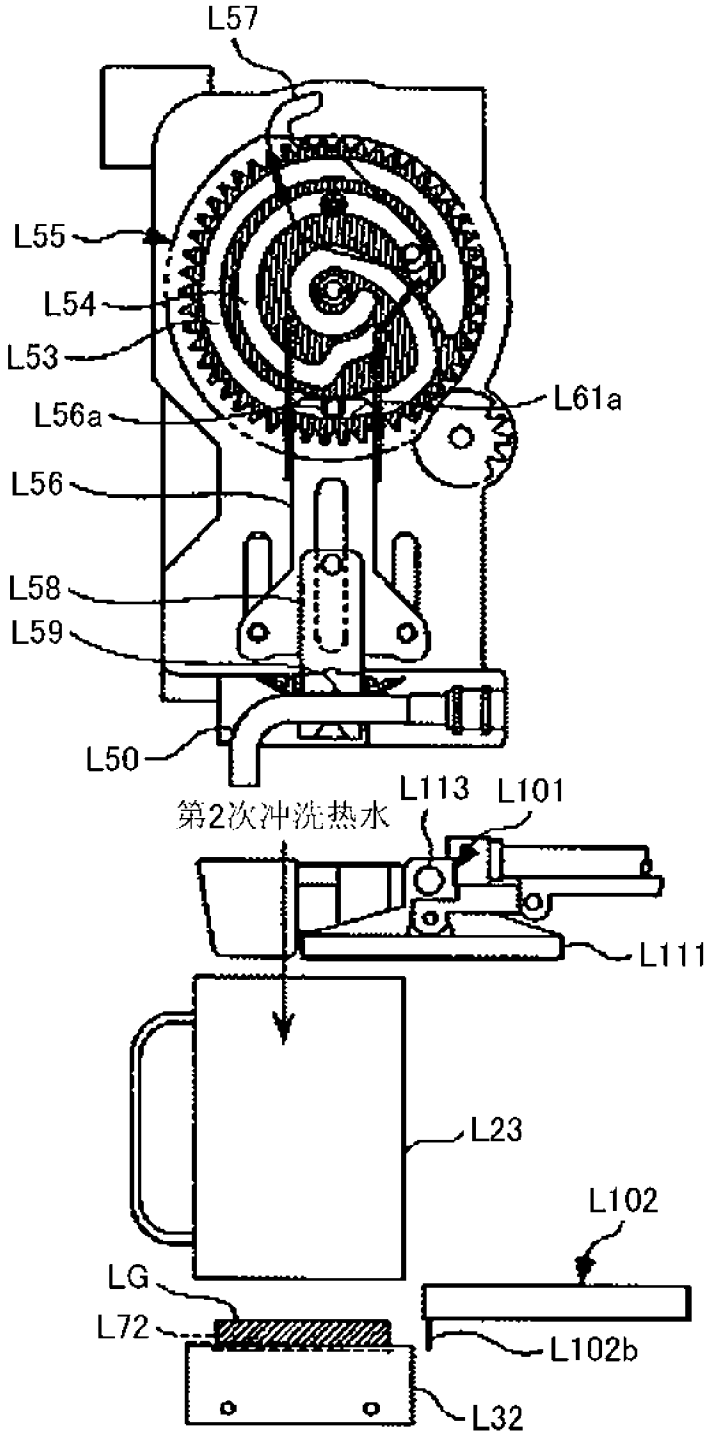


图152

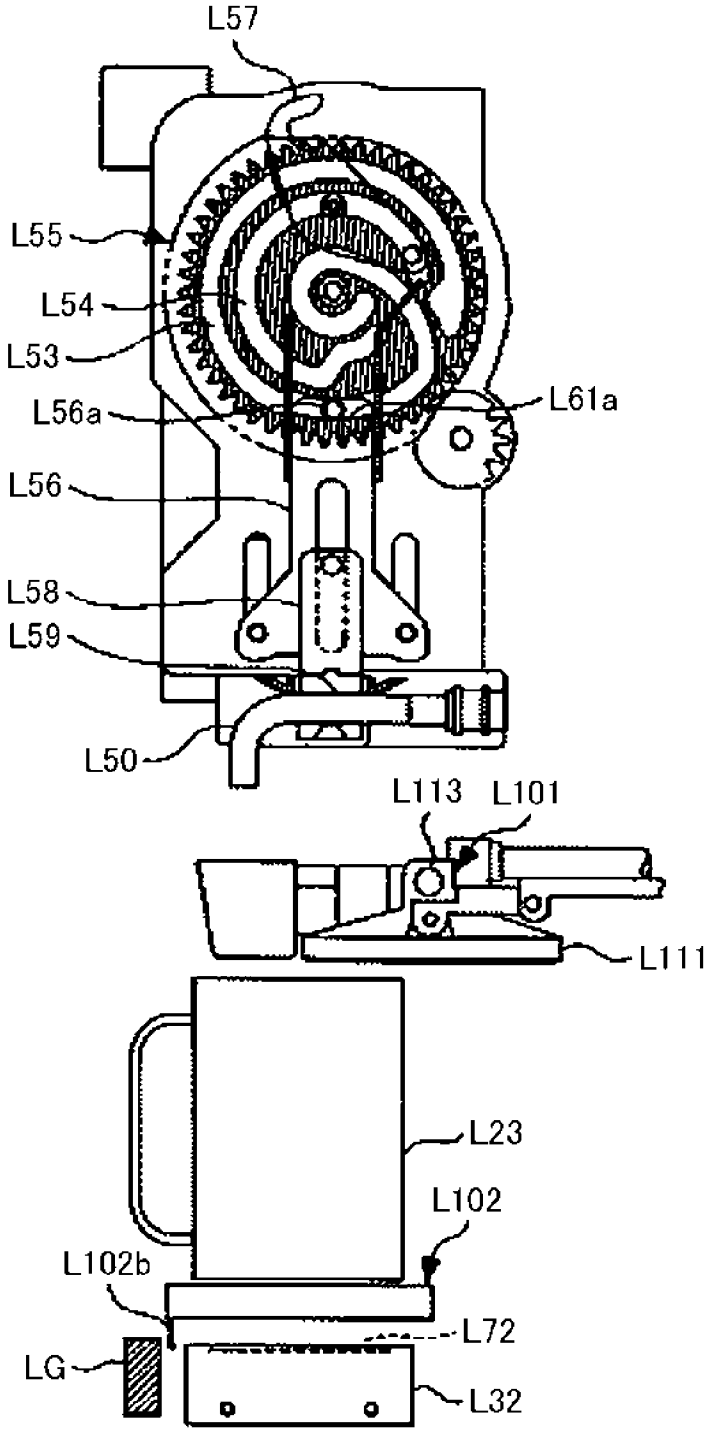


图153

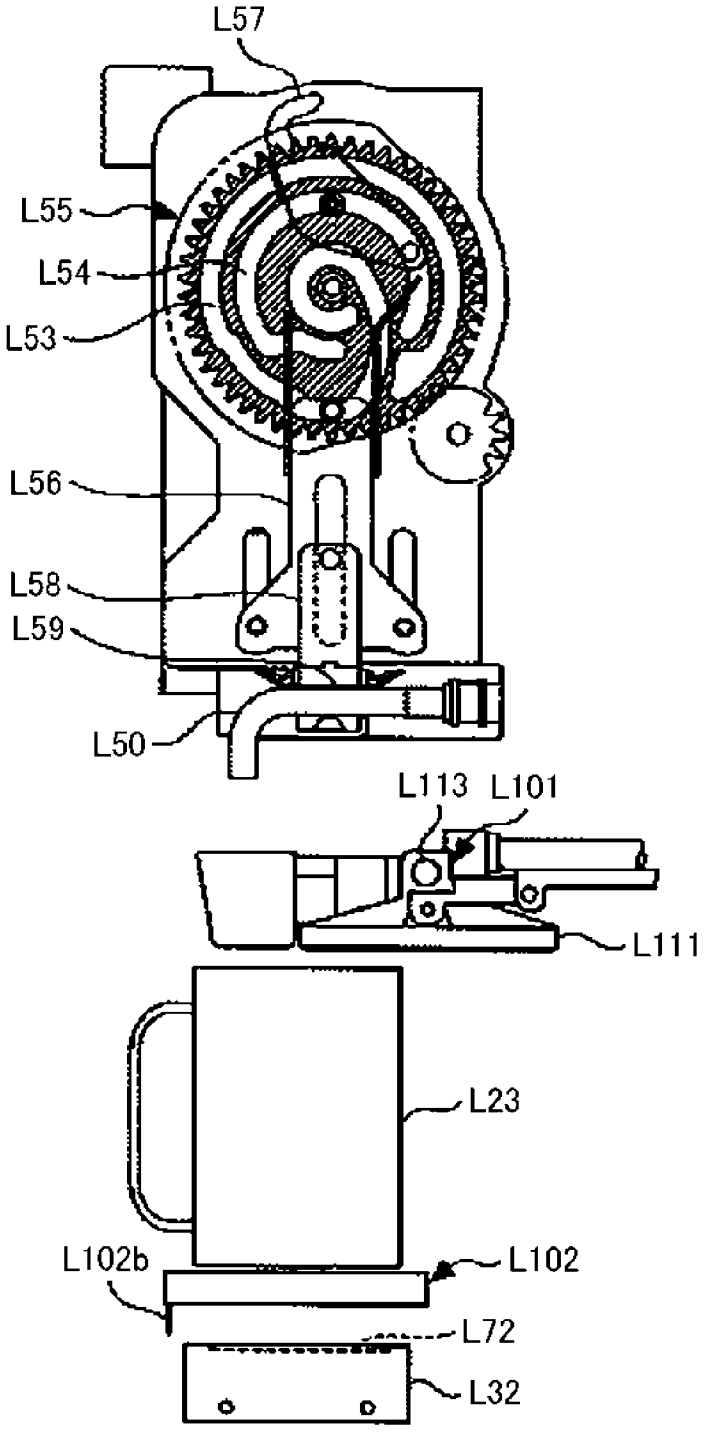


图154

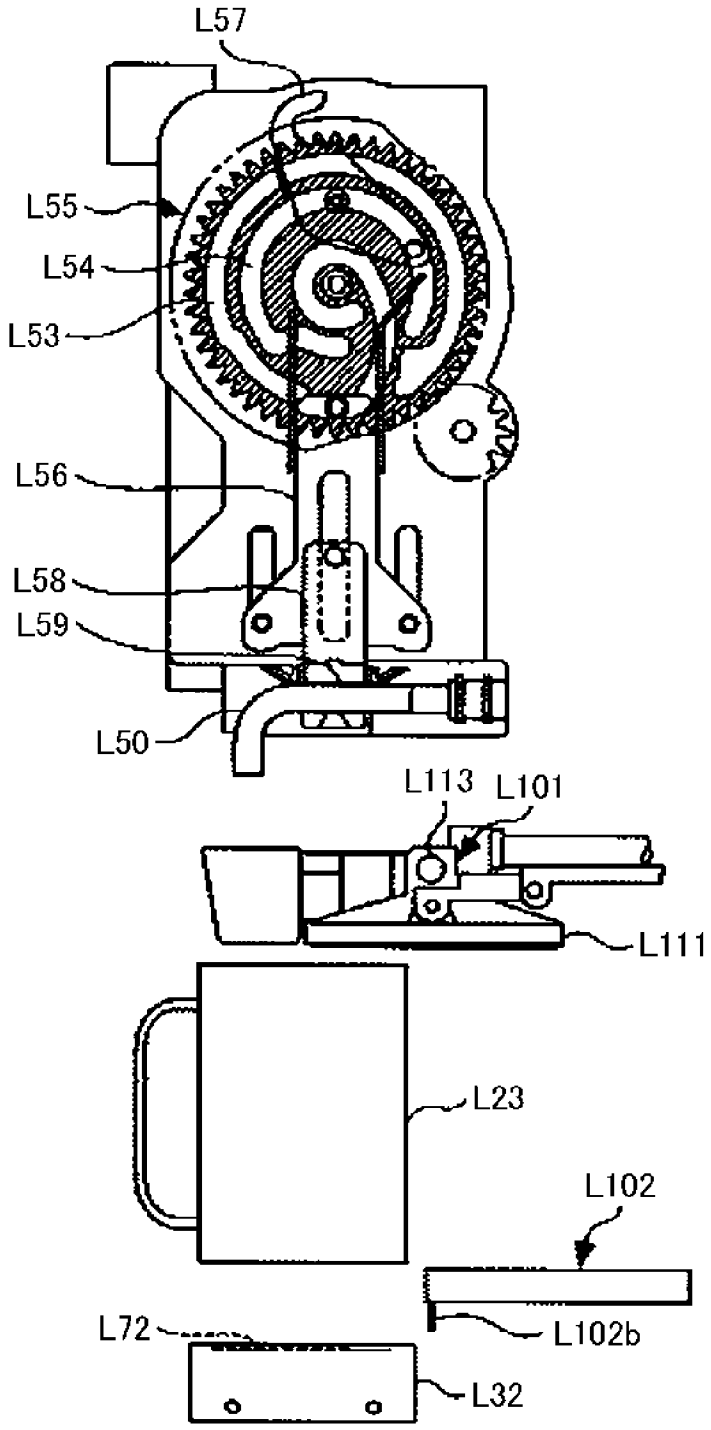


图155

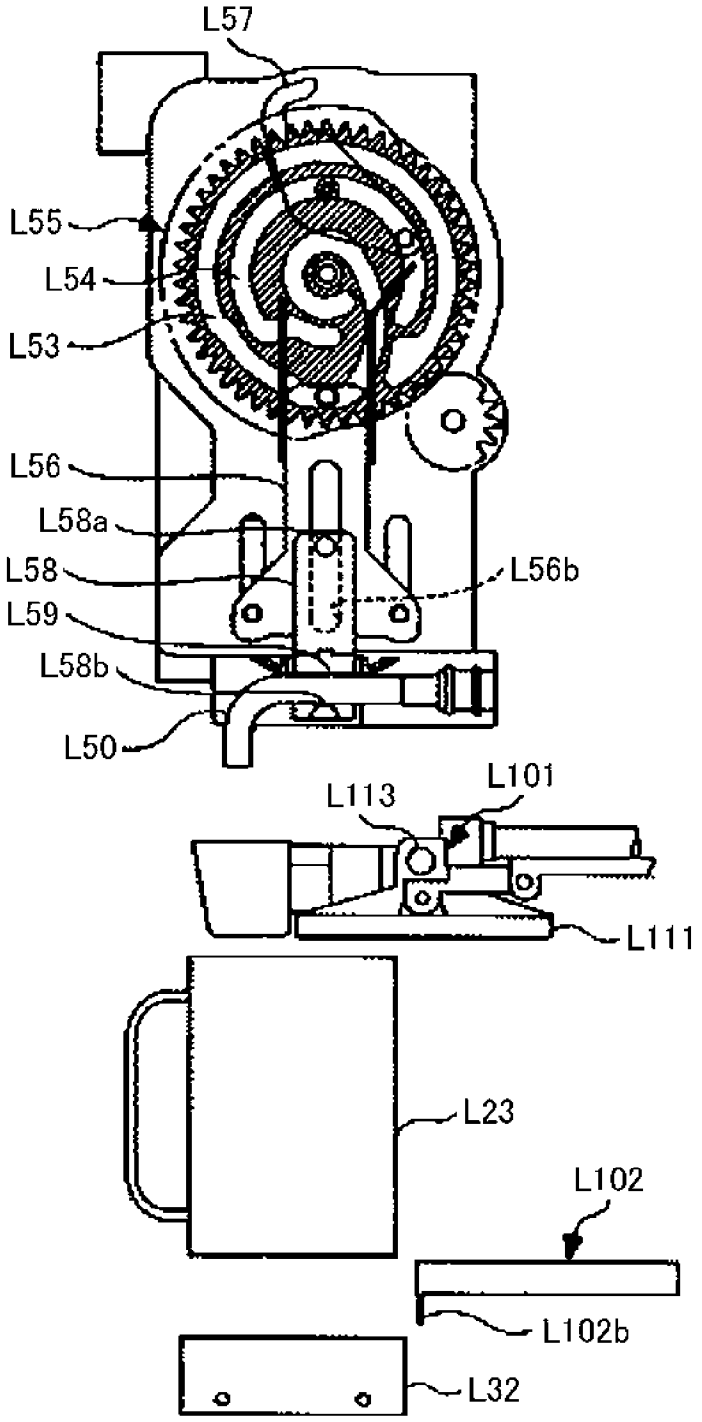


图156

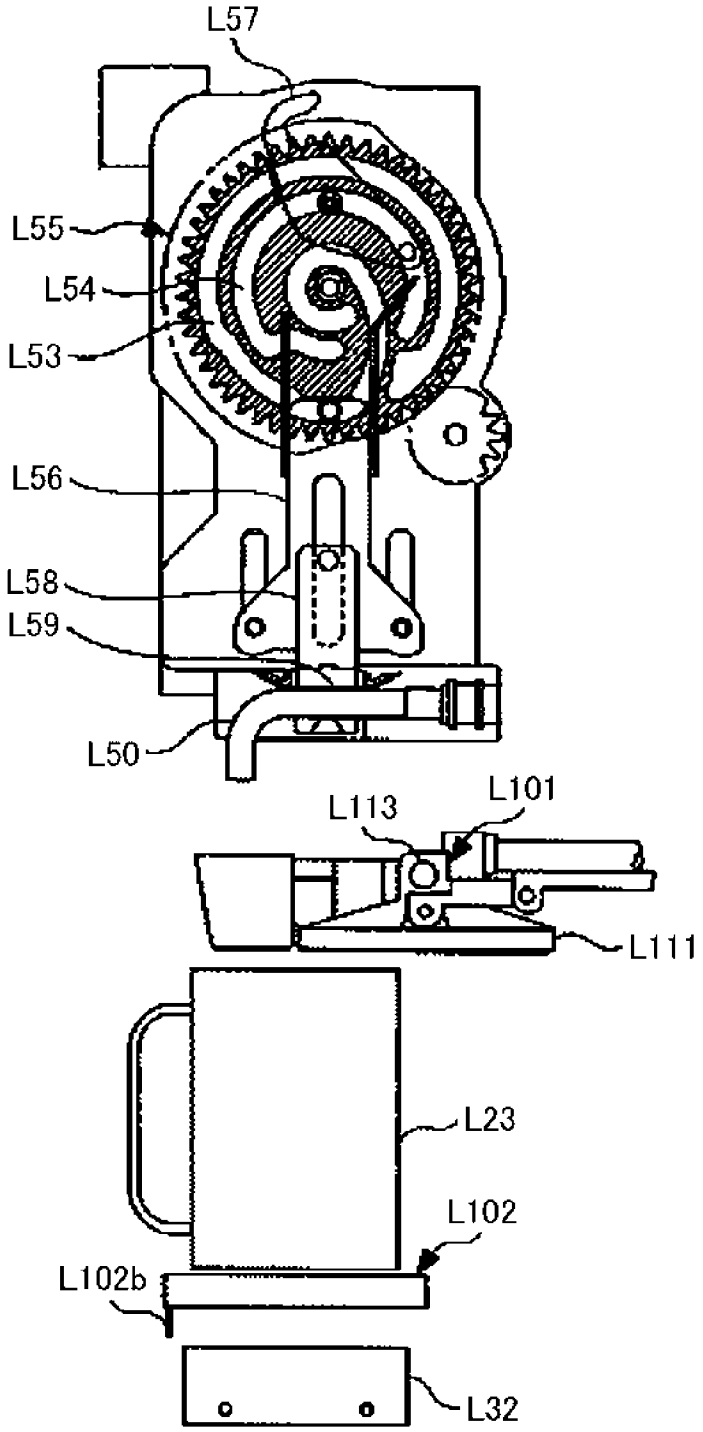


图157

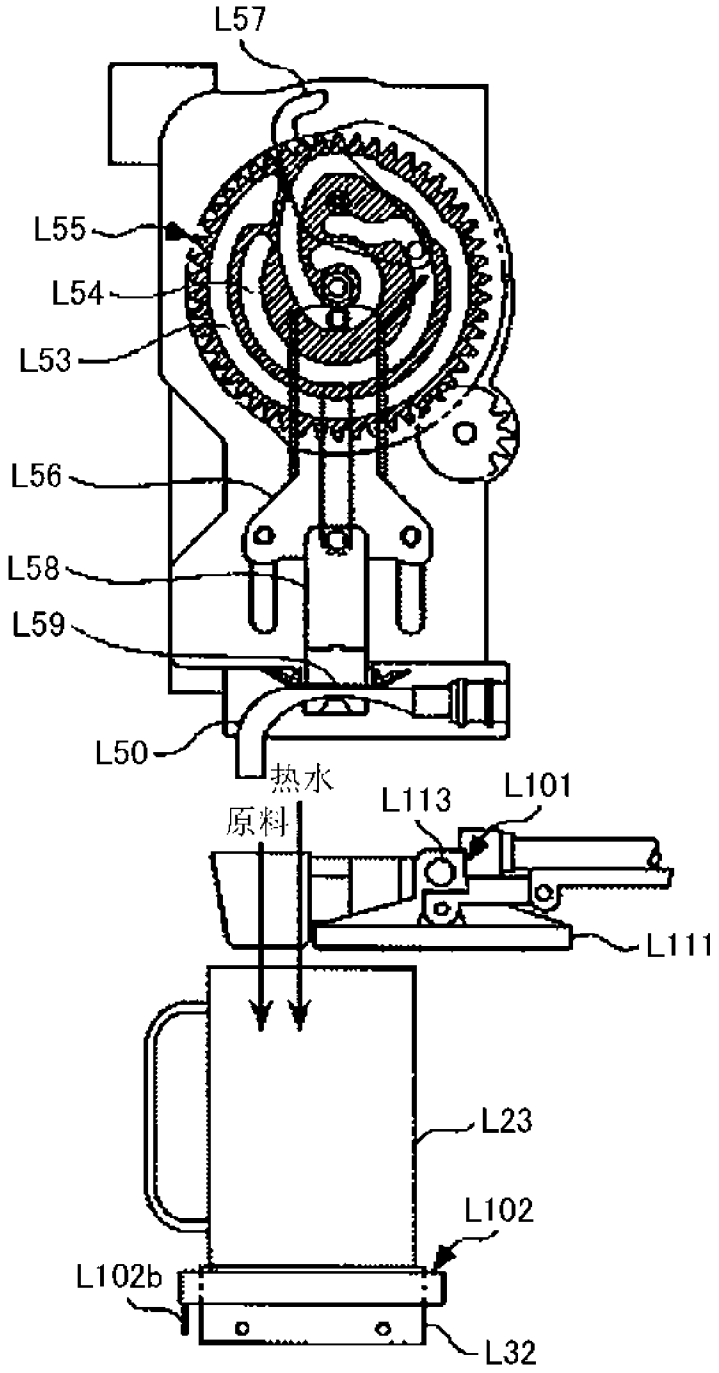


图158

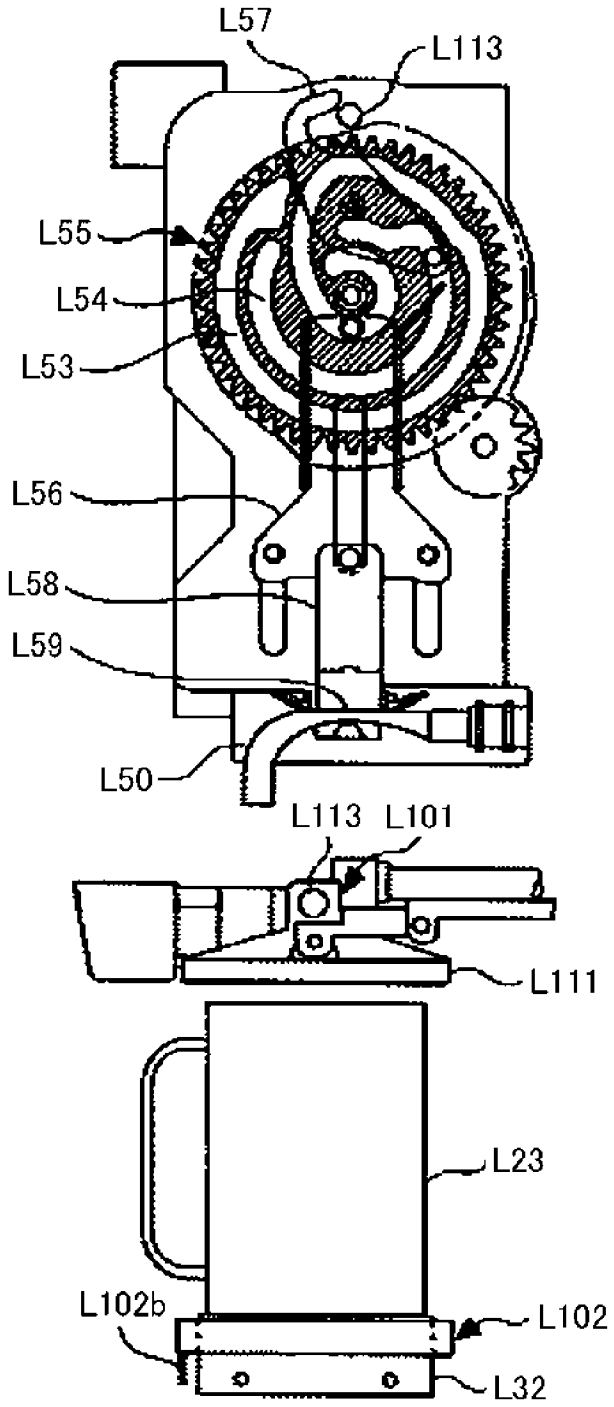


图159

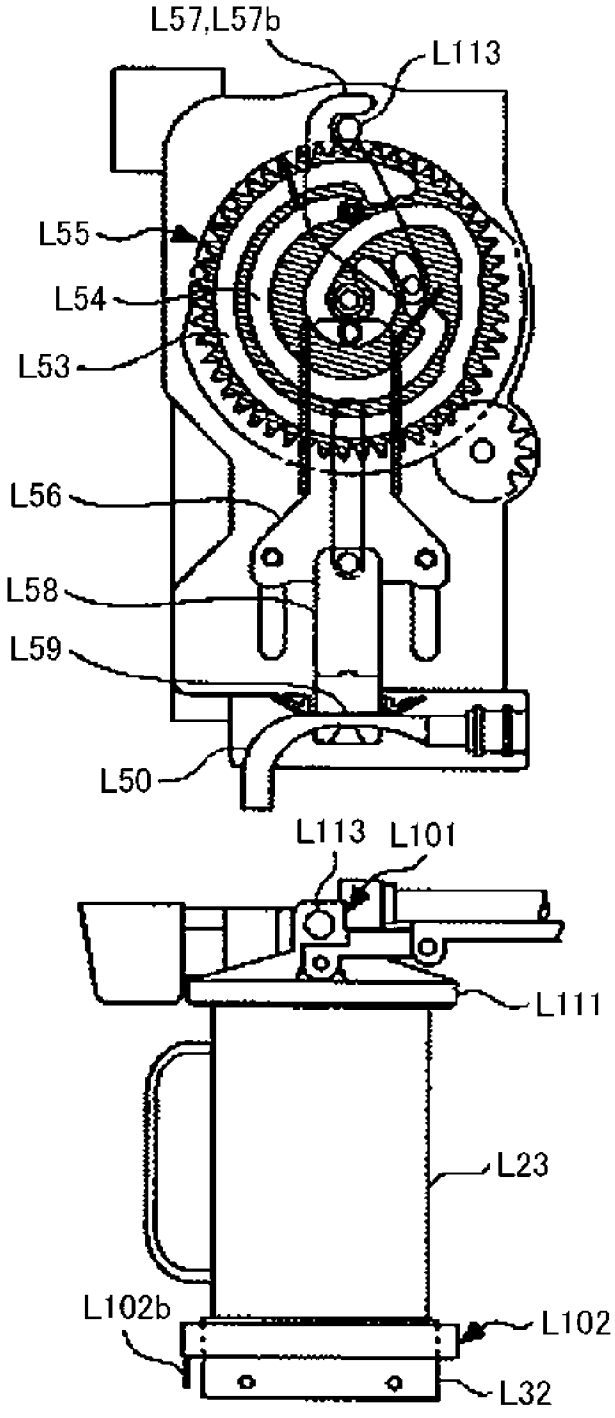


图160

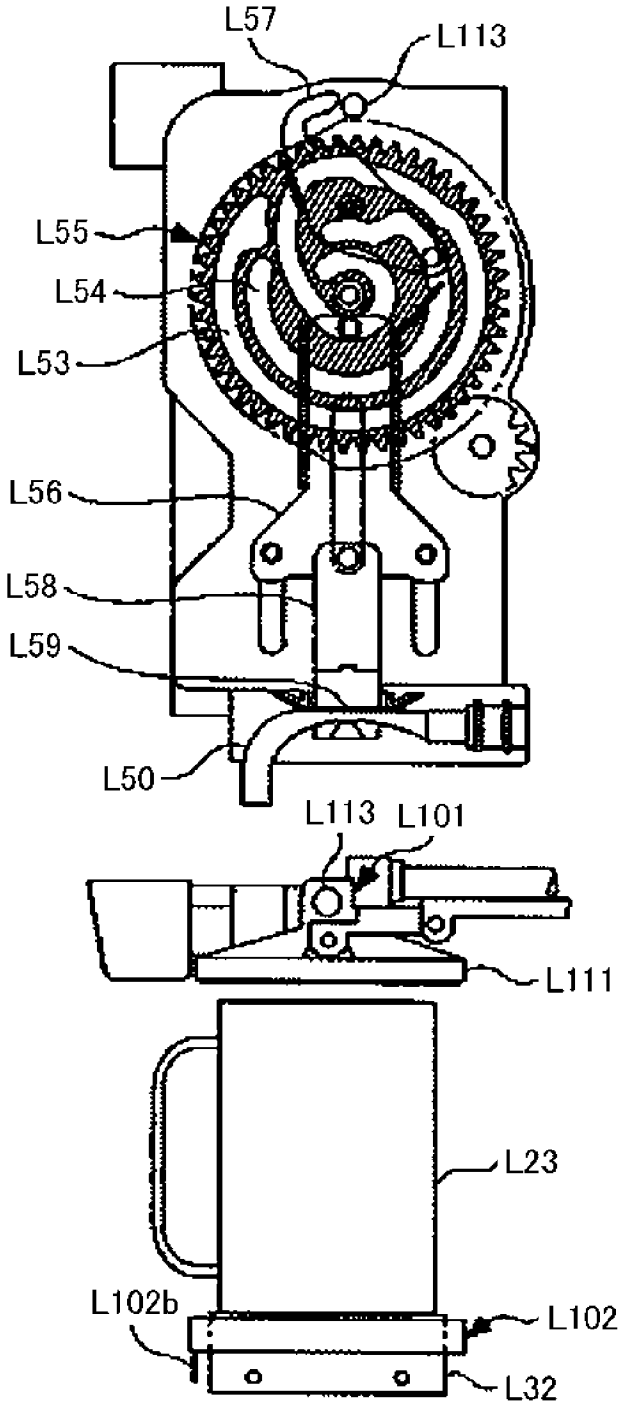


图161

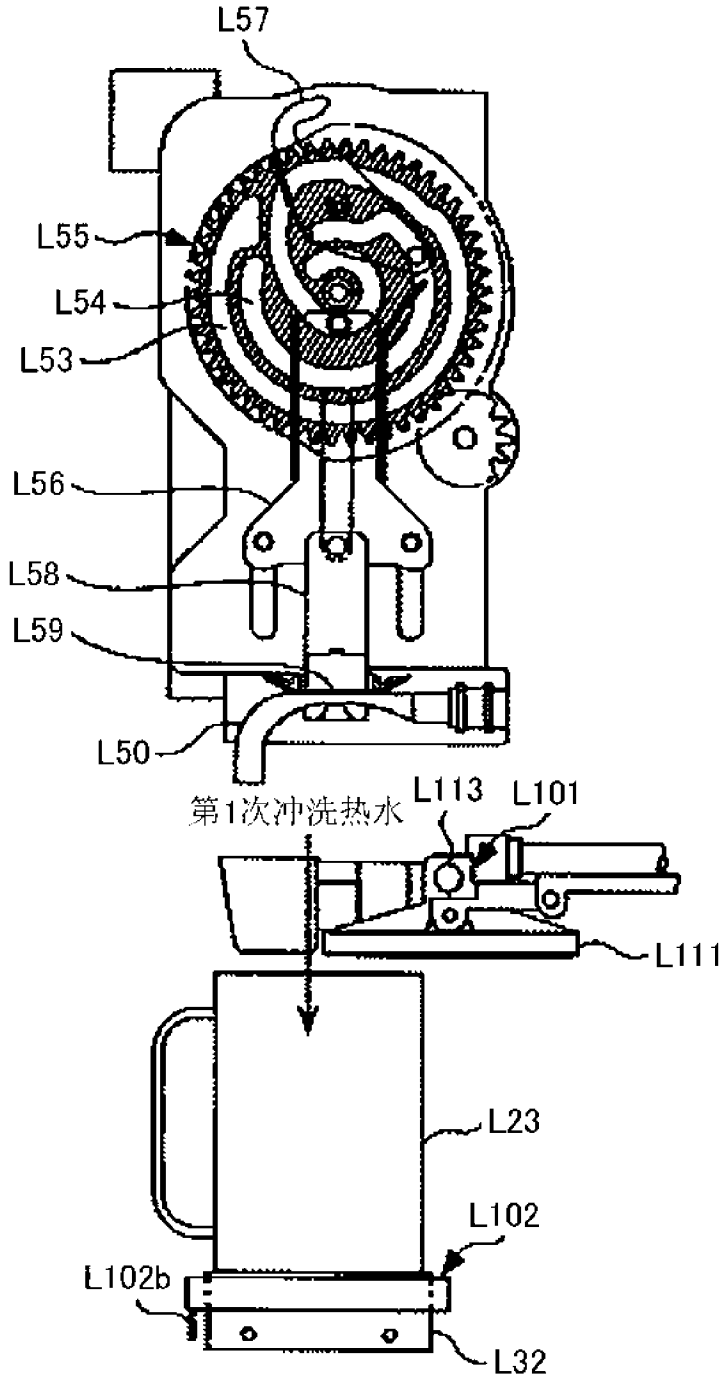


图162

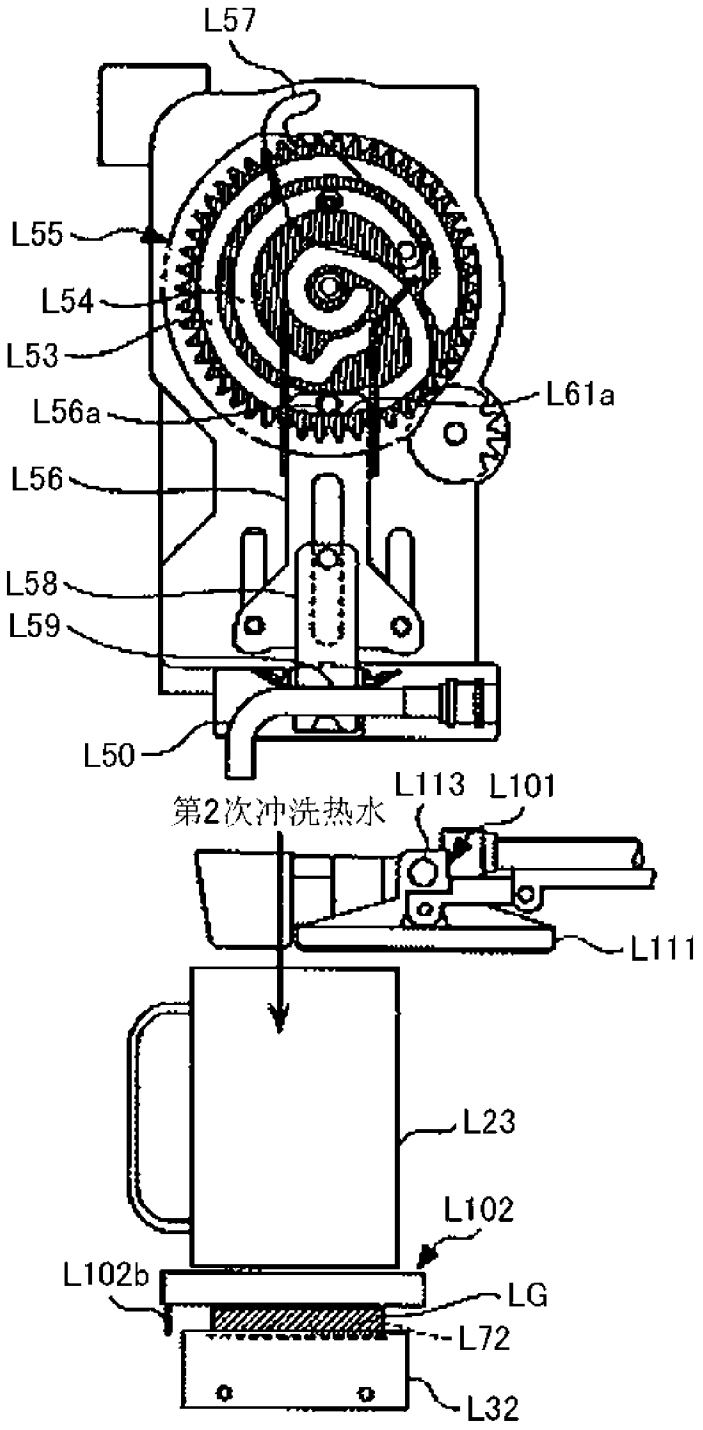


图163

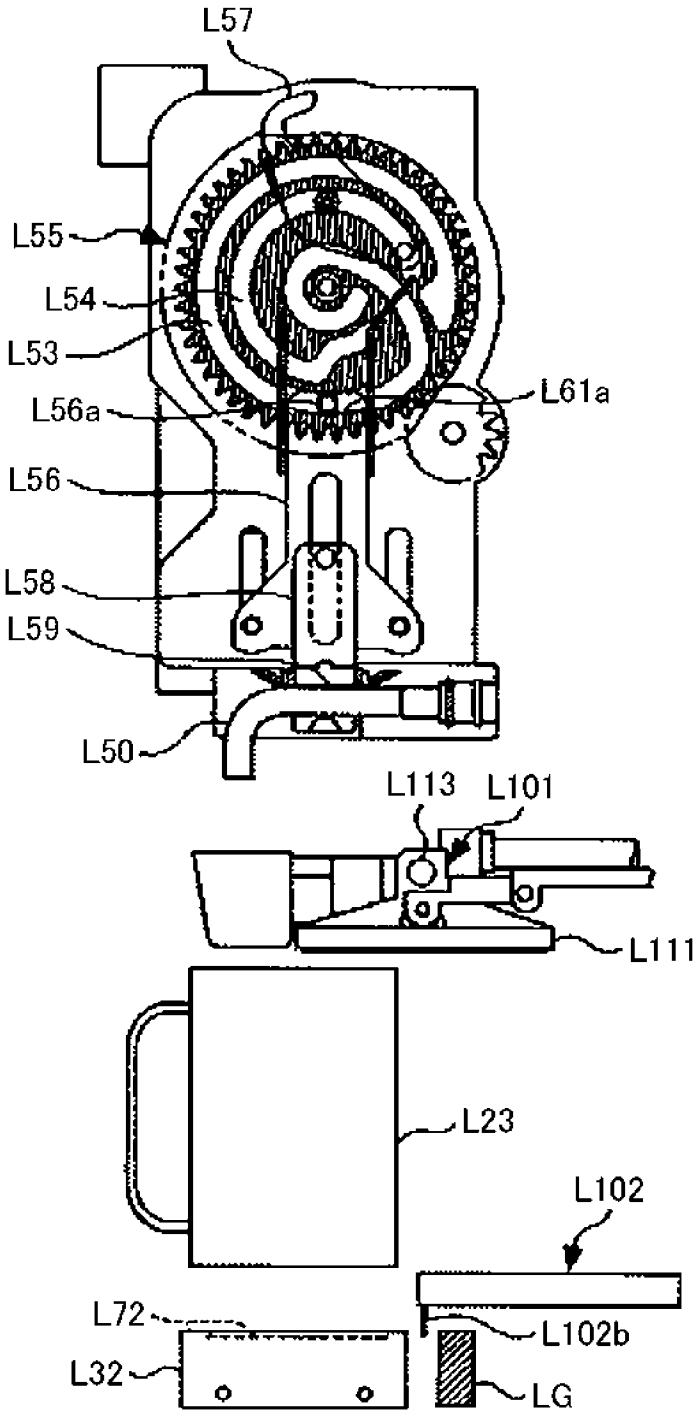


图164

动作状态		夹紧件L8A	夹紧件L8B	夹紧件L8C	凸轮圆板L55旋转角度
(1)	待机	开放	开放	开放	0°
(2)	供给原料、热水并搅拌	封闭	开放	封闭	180°
(3)	运出咖啡	开放	封闭	开放	240°
(4)	排出提取渣	开放	开放	开放	-40°

图165

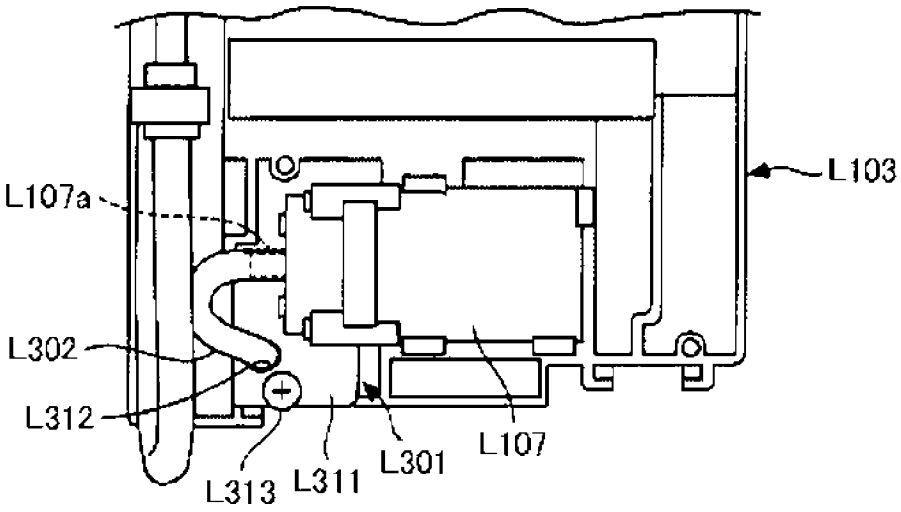


图166

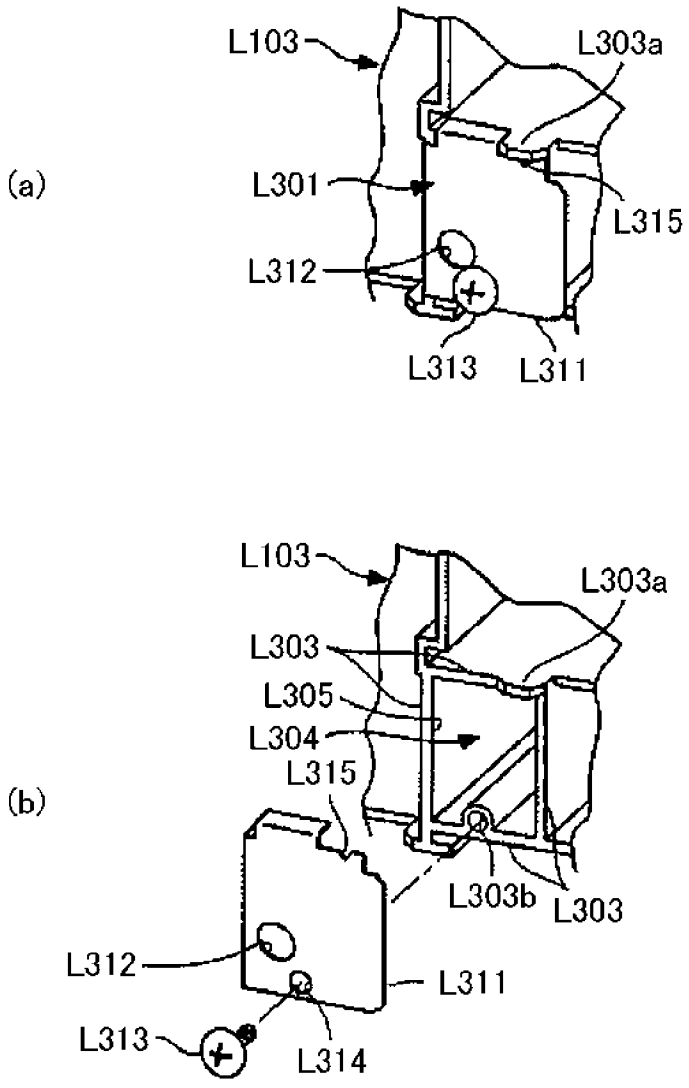


图167

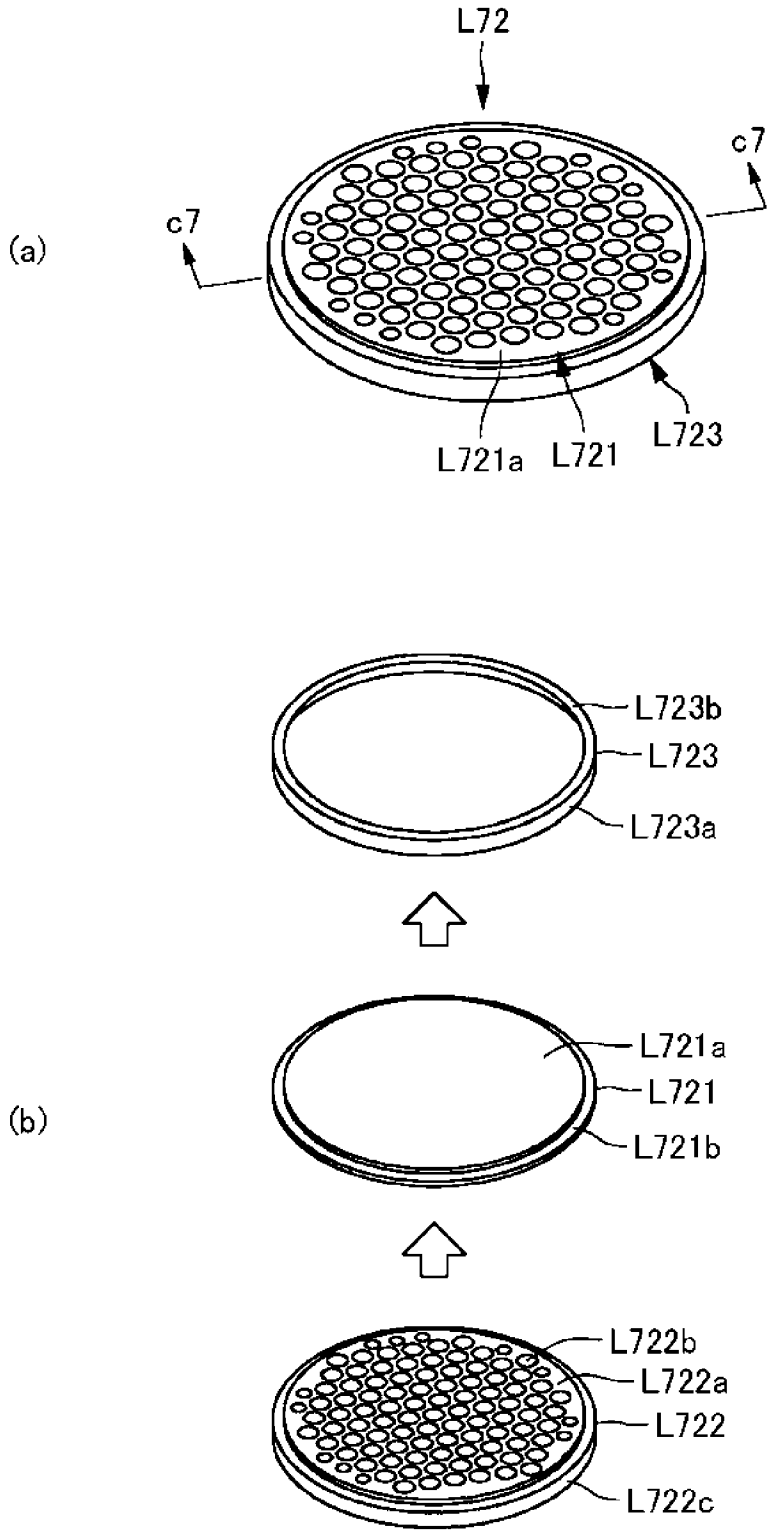


图168

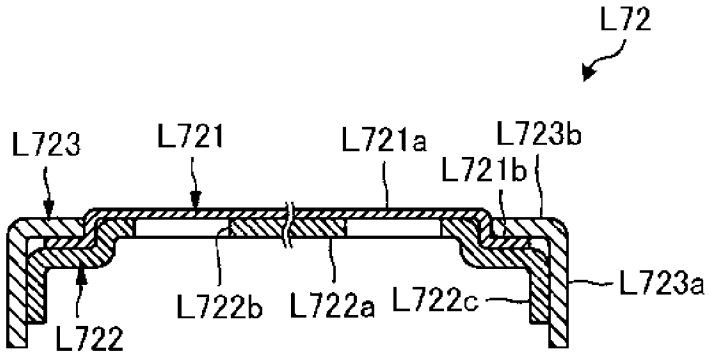
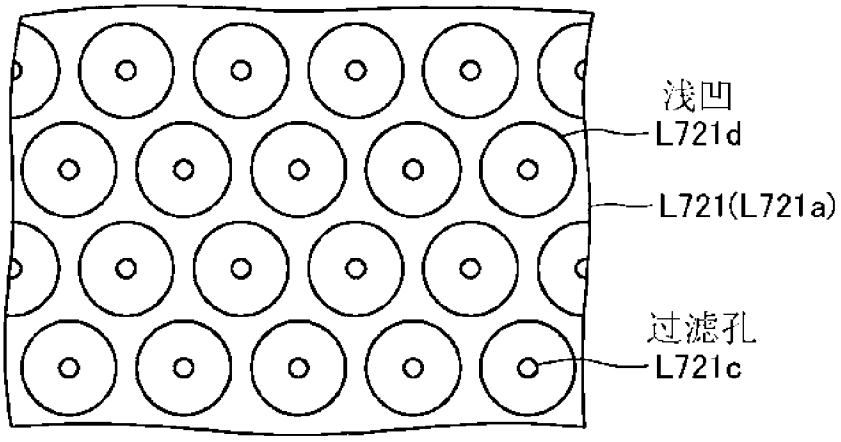
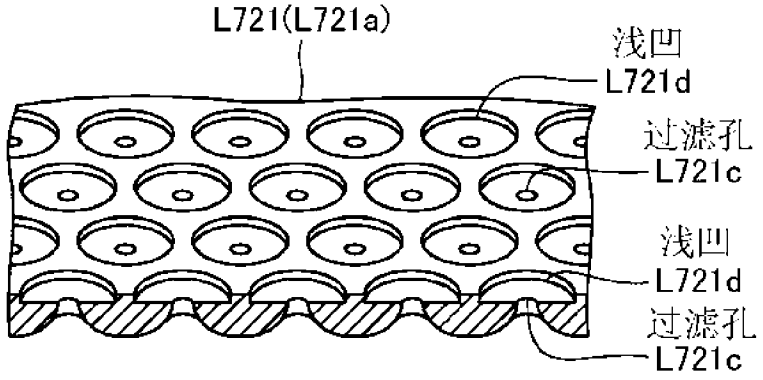


图169

(a)



(b)



(c)

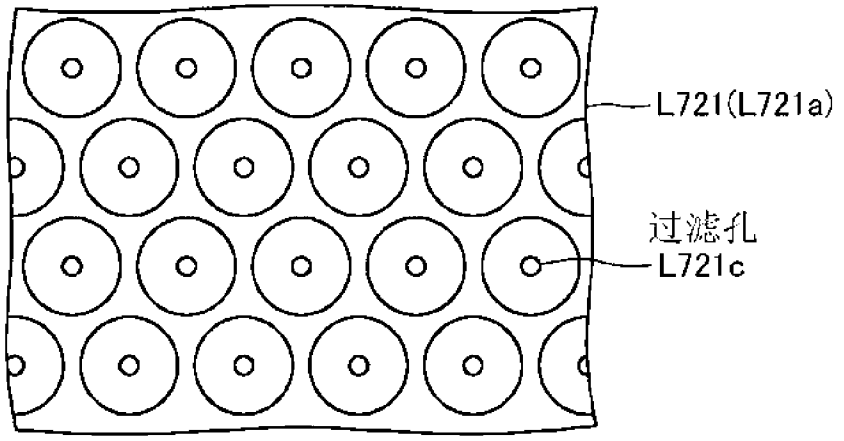


图170

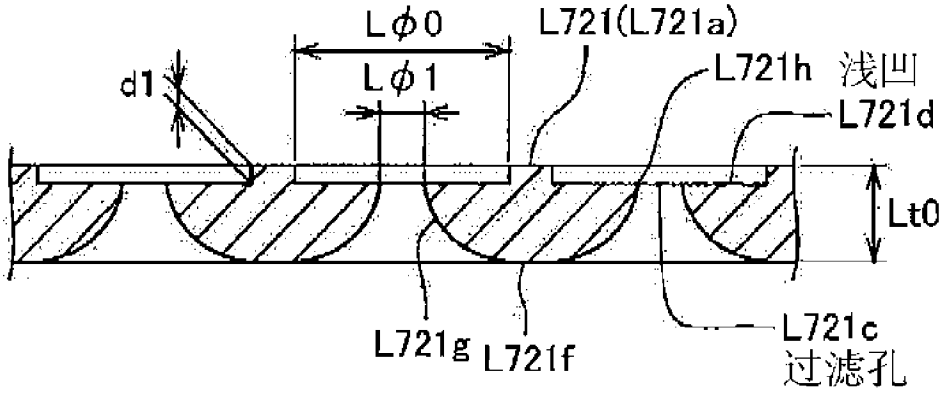


图171

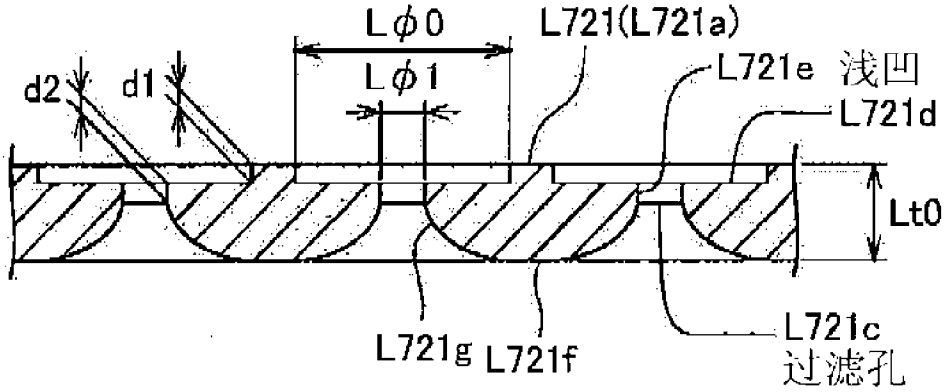


图172

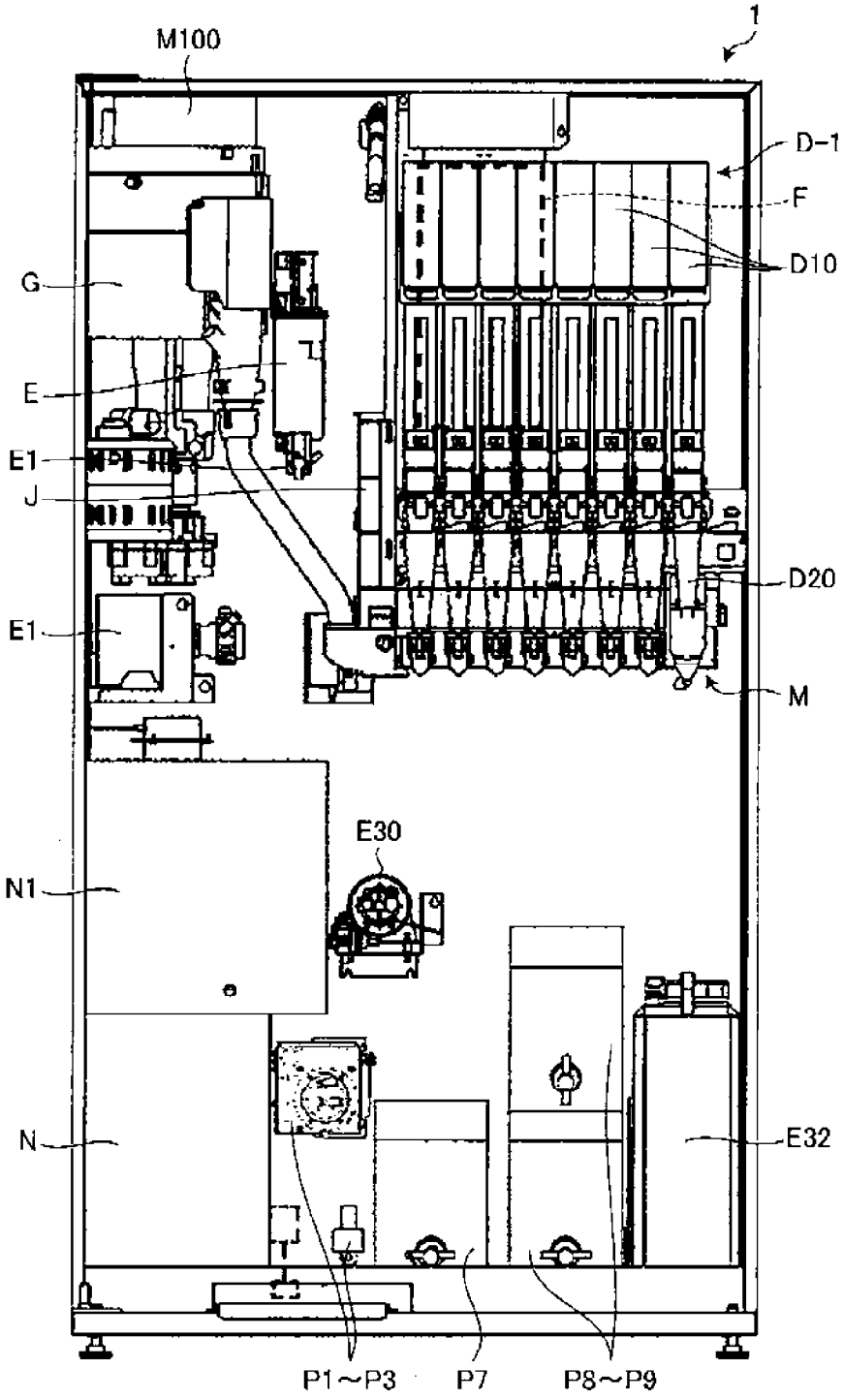


图173

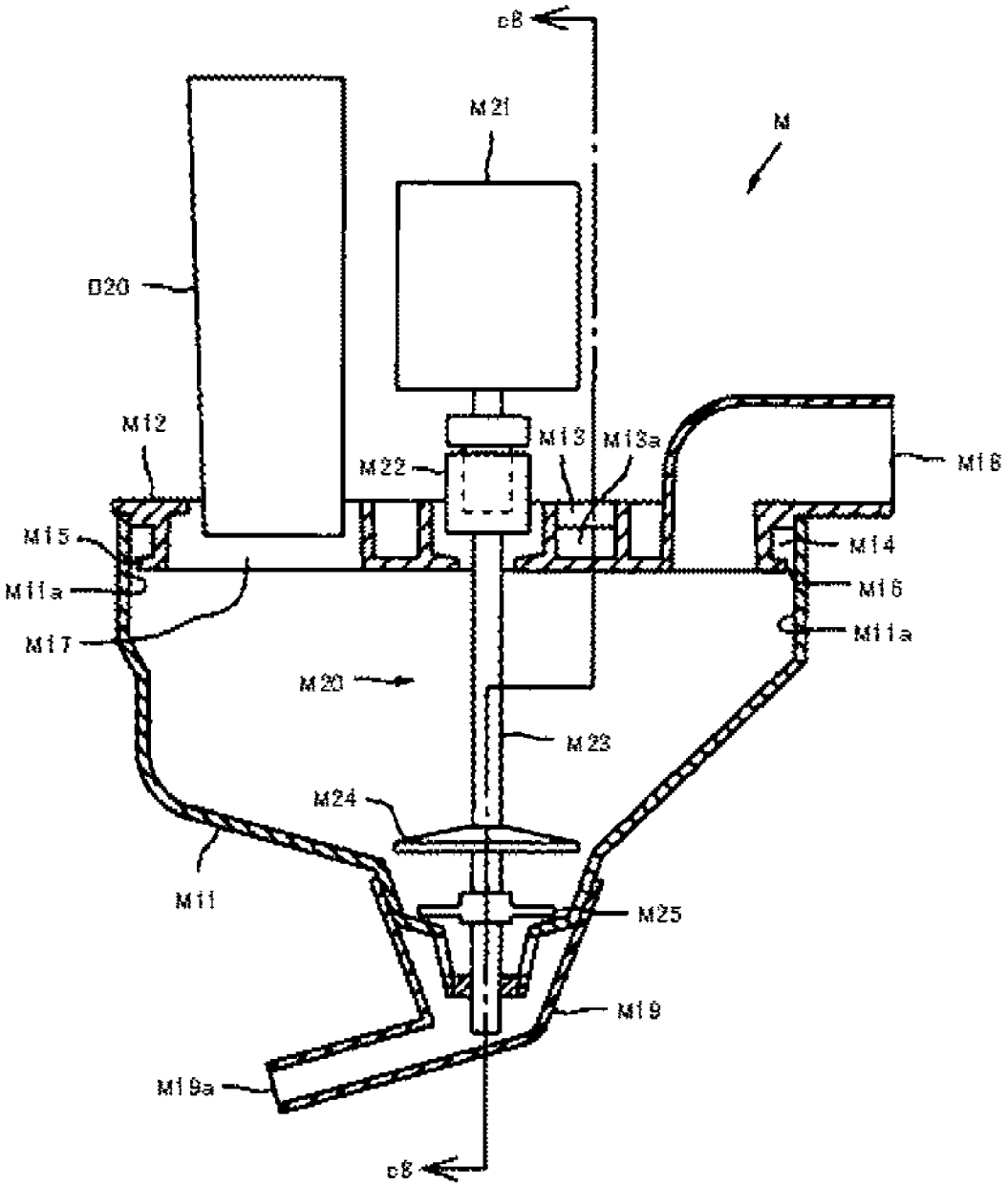


图174

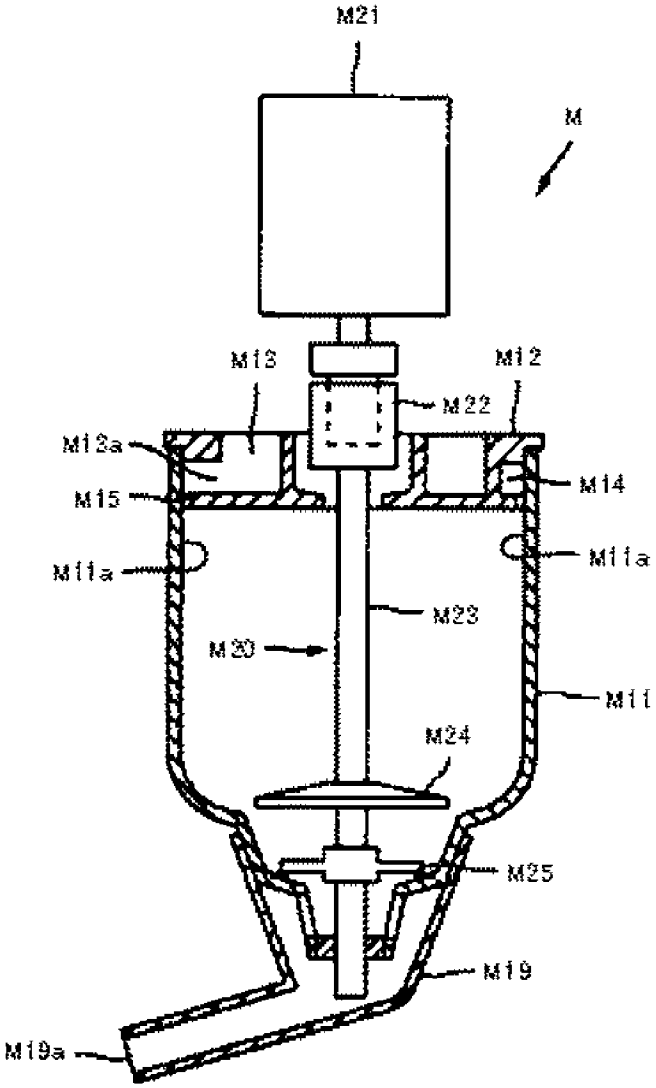


图175

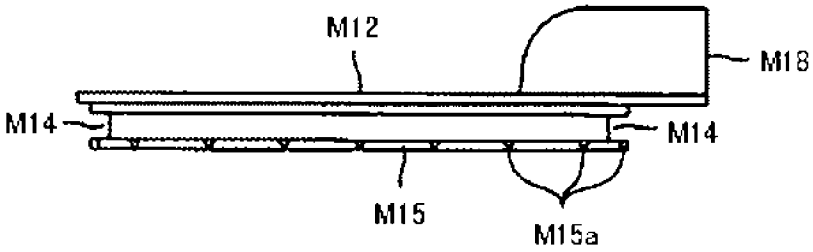


图176

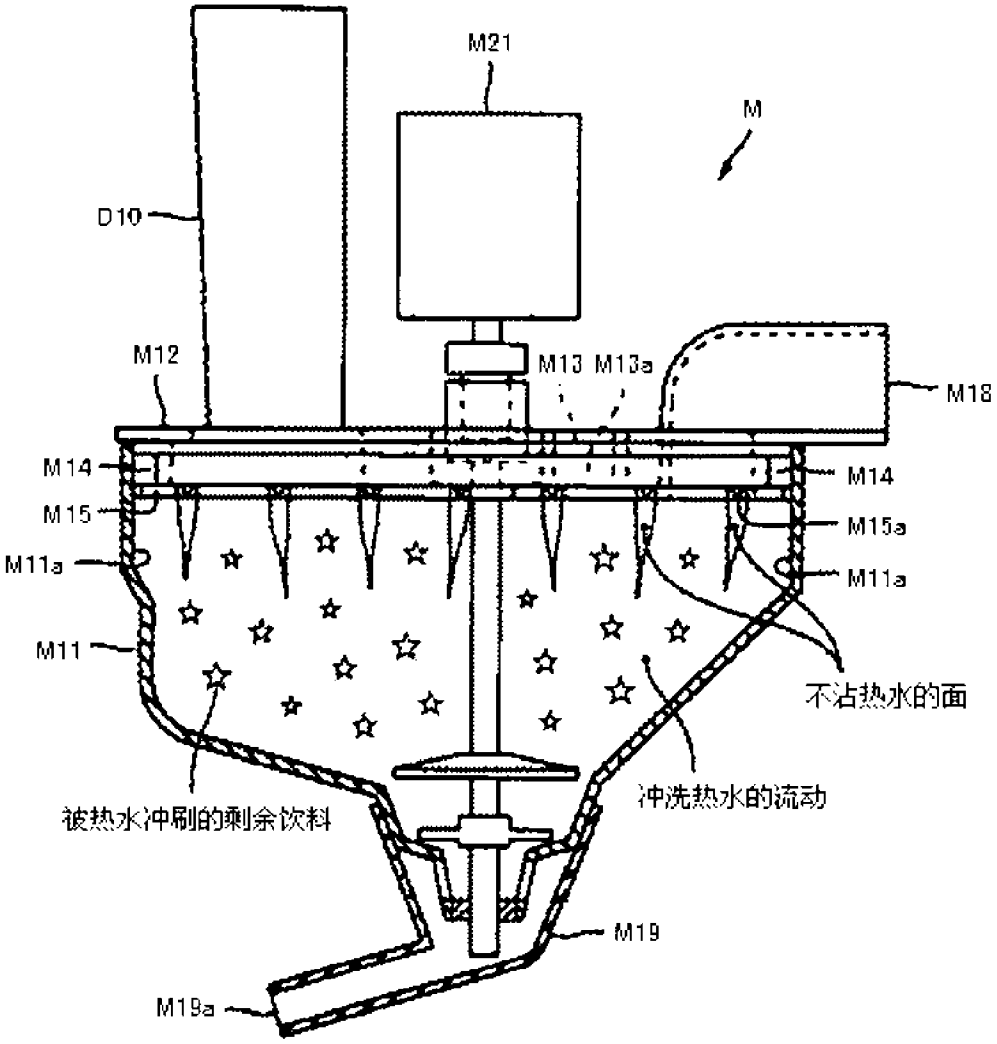


图177

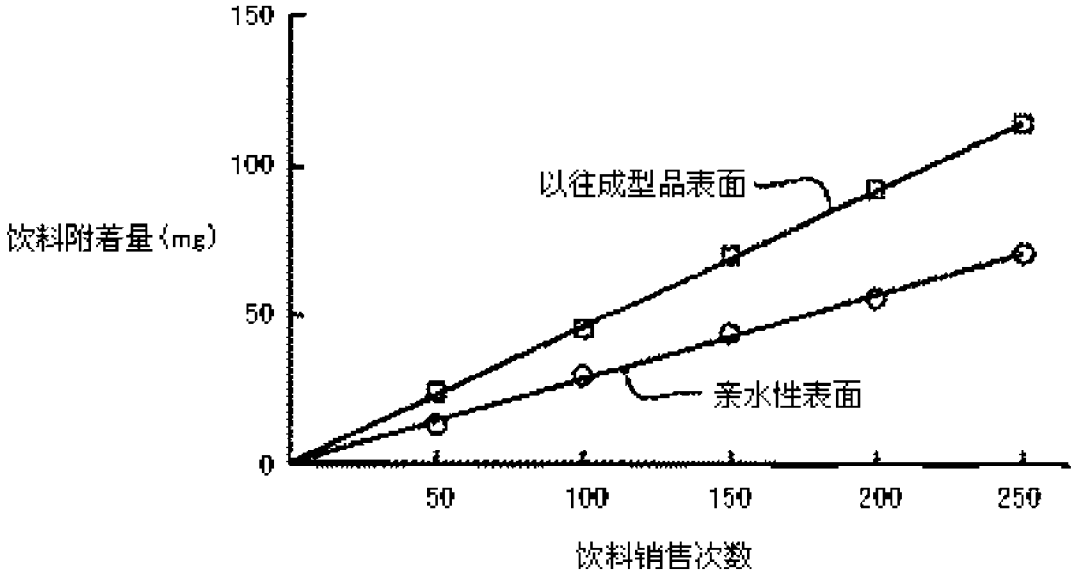


图178

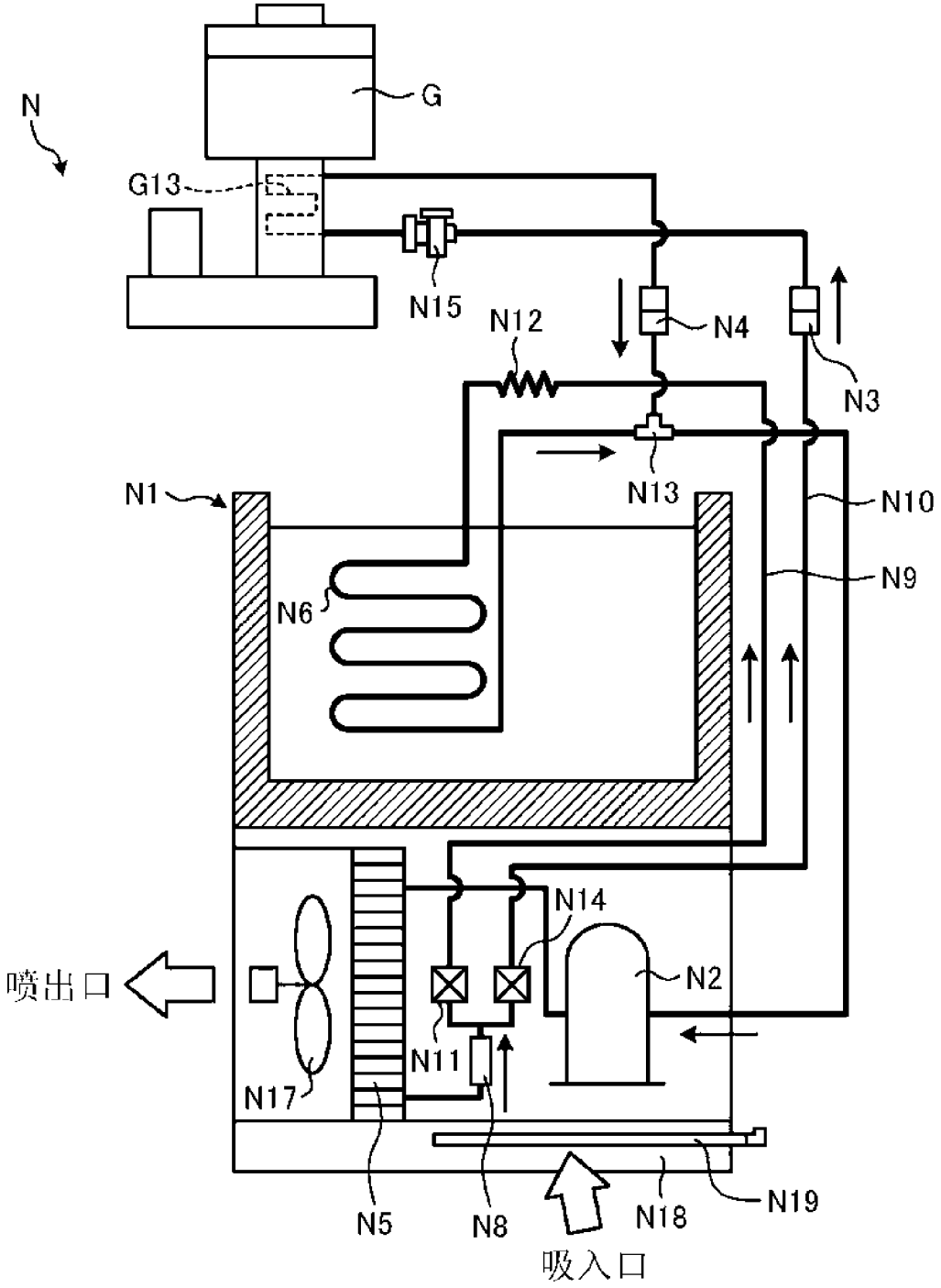


图179

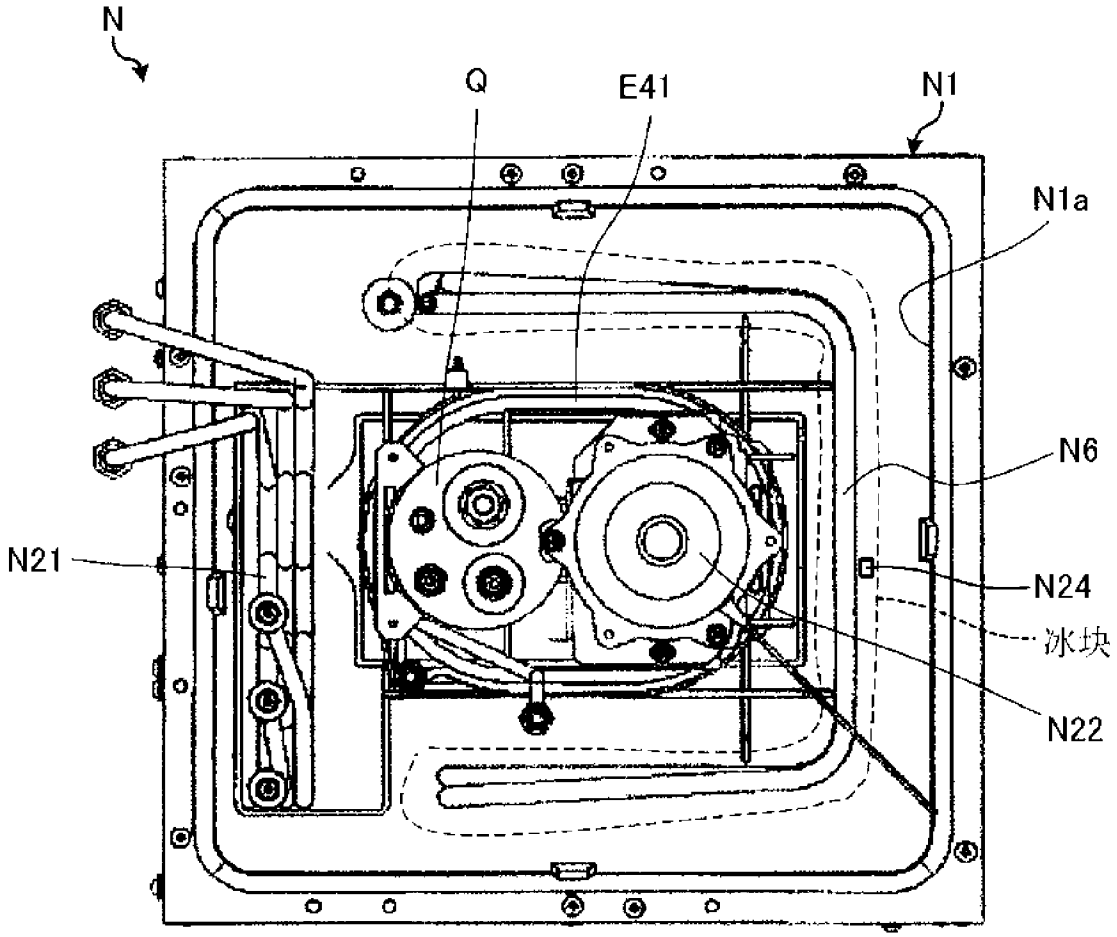


图180

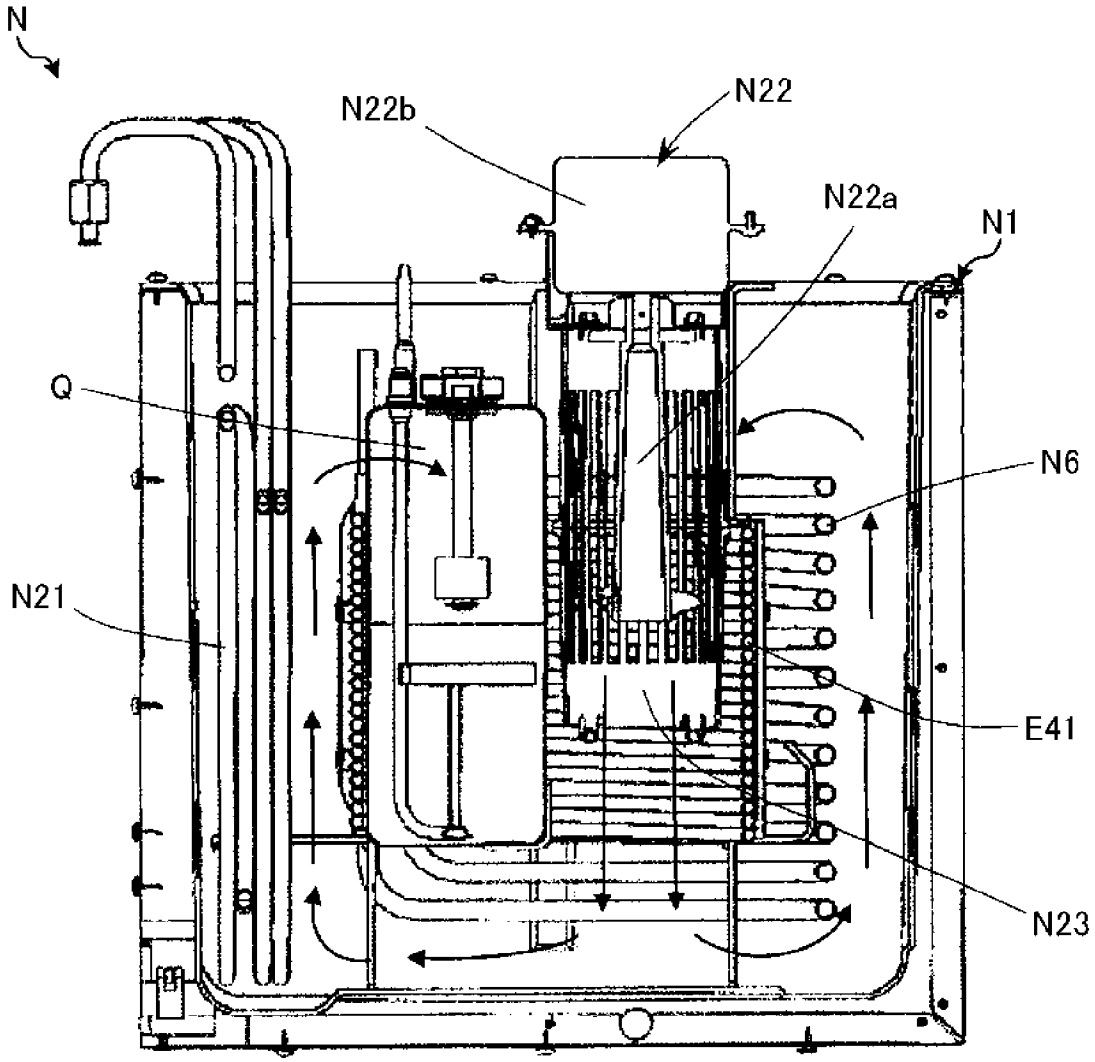


图181

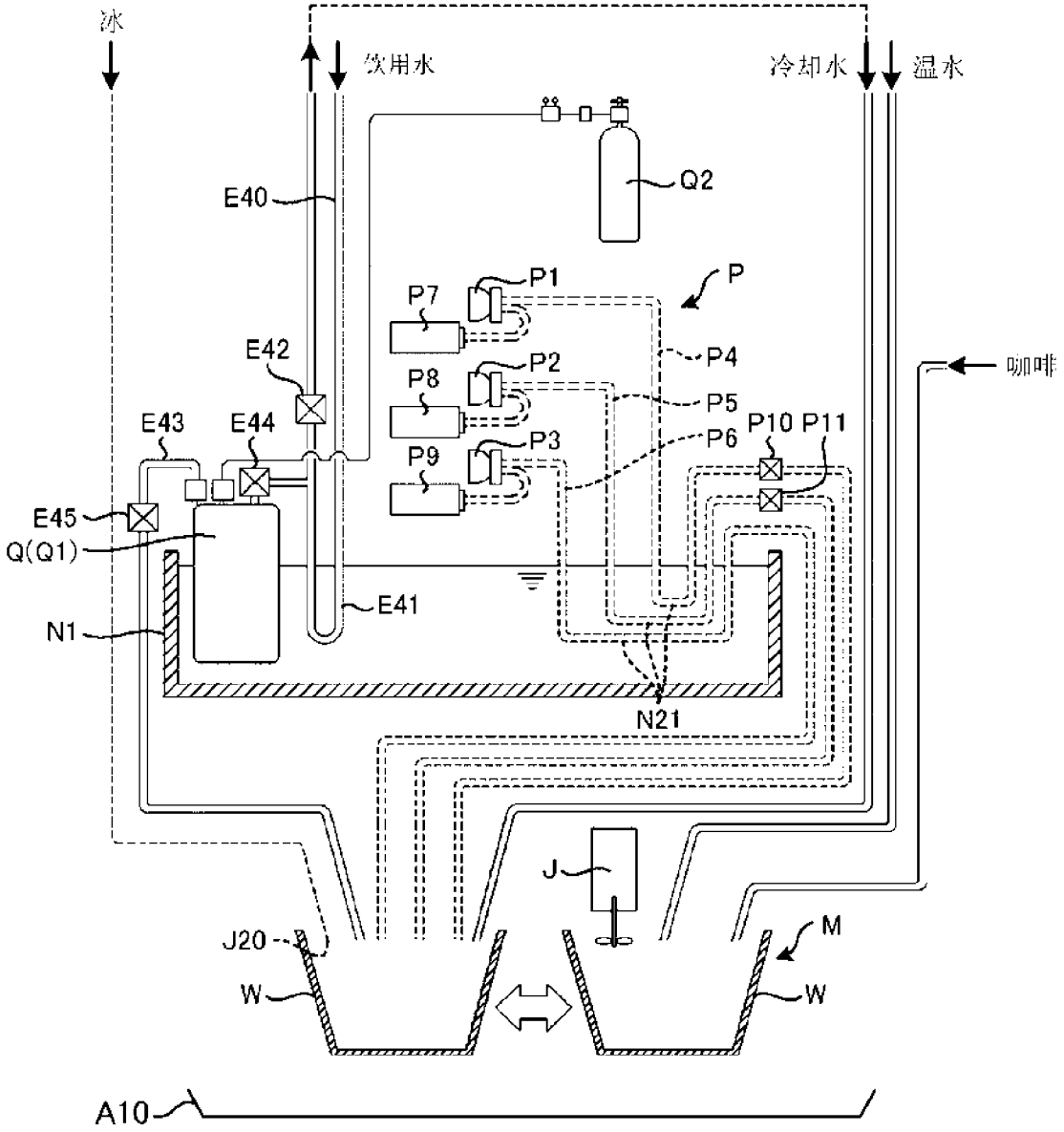


图182

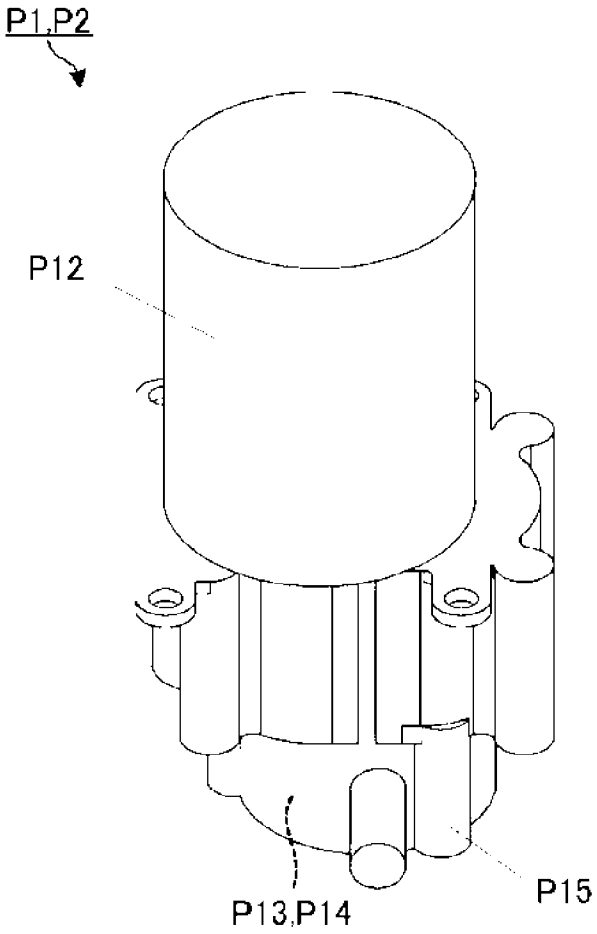


图183

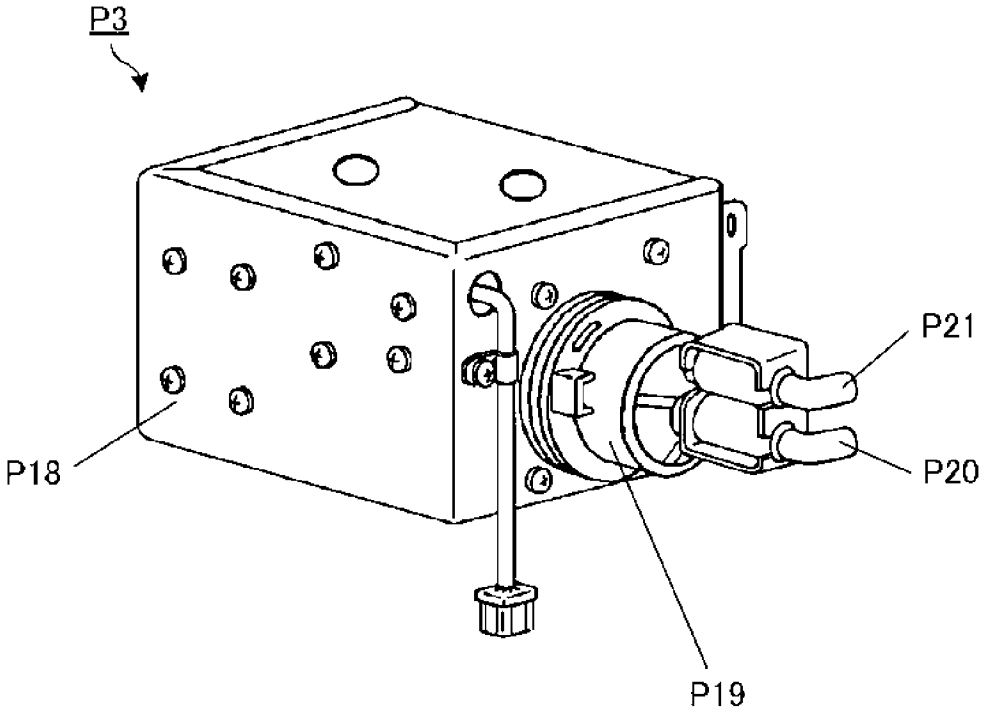


图184