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(54) **IMAGE DISPLAY SYSTEM, IMAGE DISPLAY DEVICE, AND IMAGE DISPLAY METHOD**

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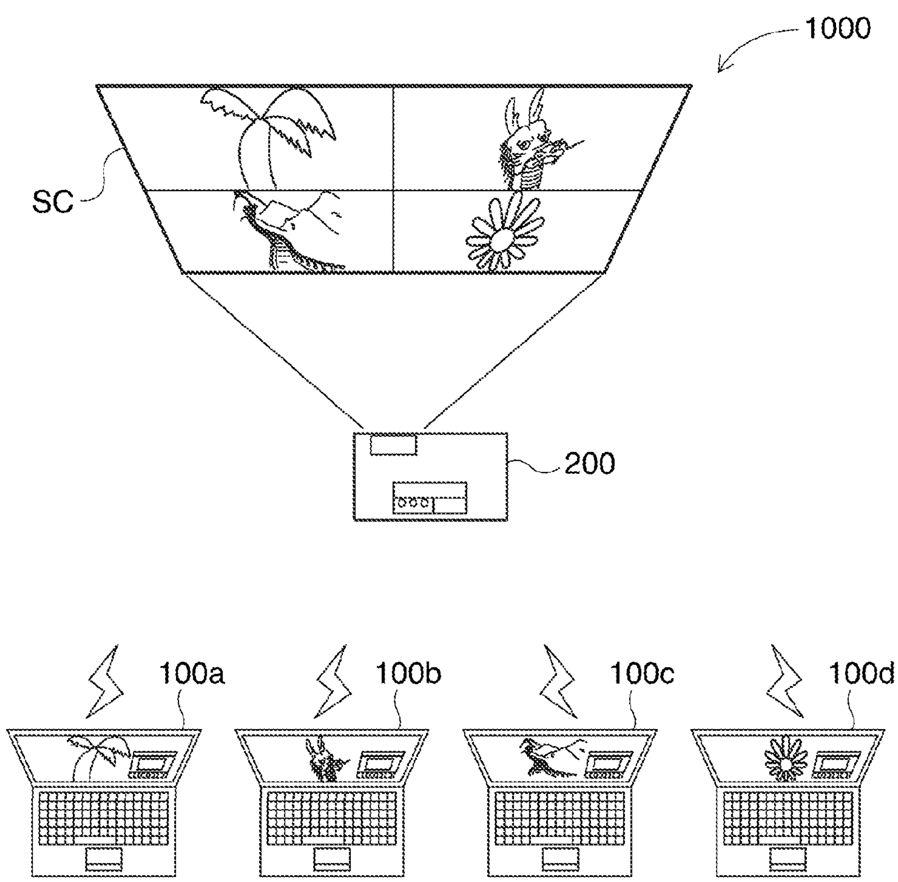
H04N 9/31 (2006.01)

(52) **U.S. Cl.** **345/1.3**; 348/744

(57) **ABSTRACT**

An image display system includes: a plurality of image supply devices each having an image display section, and an image transmission section adapted to generate a supply image and to externally transmit the supply image; and an image display device capable of dividing a common screen area into one or more screen areas, and of displaying the supply image supplied from each of the image supply devices in the one or more screen areas, wherein each of the image supply devices displays a common screen area operating image to operate a display state of the common screen area in the image display section, and supplies a display image of the image display section to the image display device as the supply image, and the image display device changes the display state of the common screen area in accordance with an operation in each of the image supply devices.



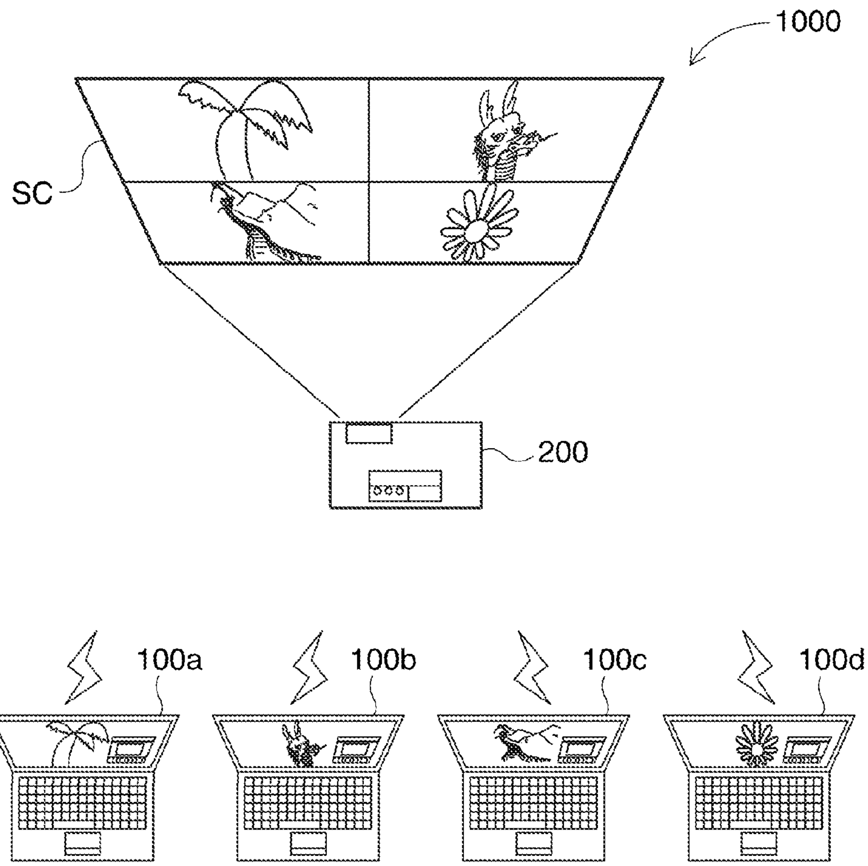


FIG. 1

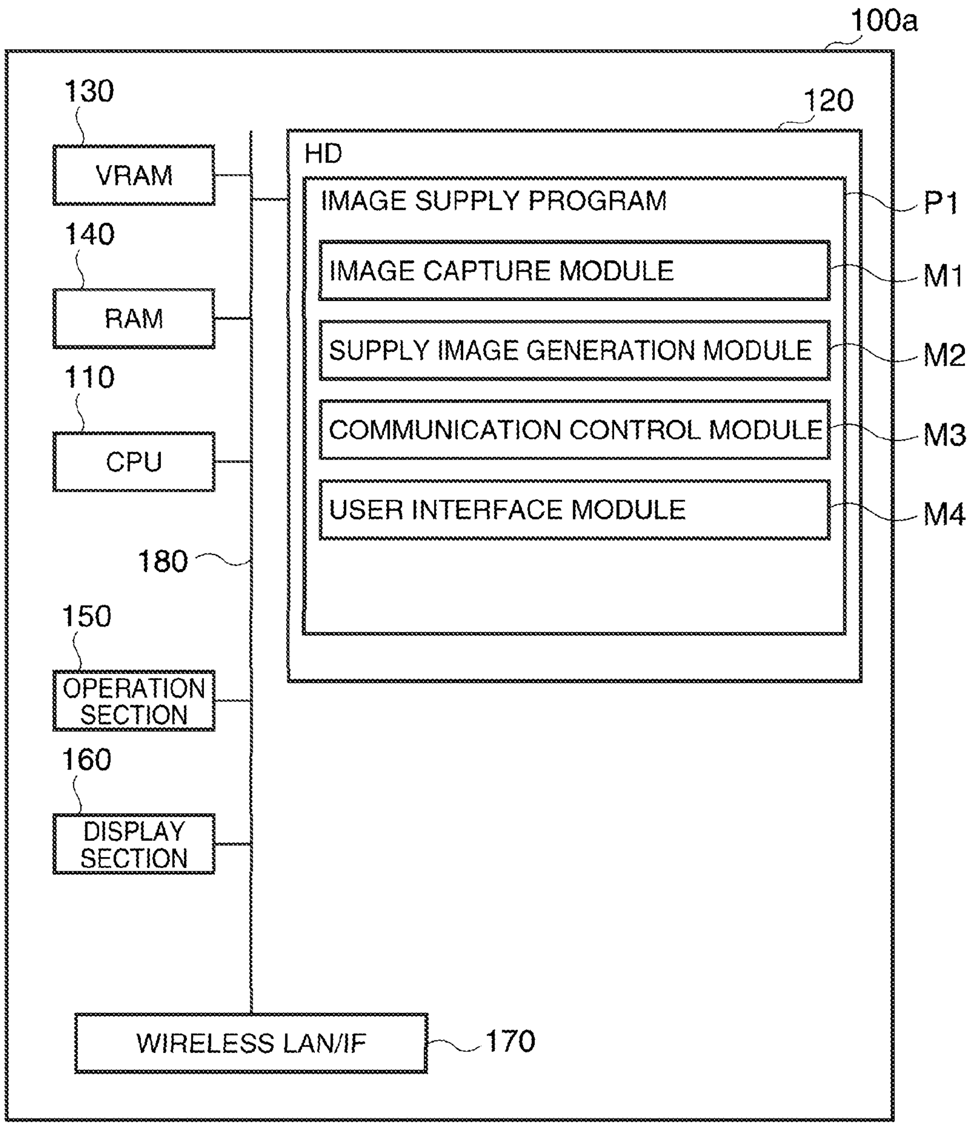

100a
130
VRAM
140
RAM
110
CPU
180
150
OPERATION SECTION
160
DISPLAY SECTION
120
HD
IMAGE SUPPLY PROGRAM
P1
IMAGE CAPTURE MODULE
M1
SUPPLY IMAGE GENERATION MODULE
M2
COMMUNICATION CONTROL MODULE
M3
USER INTERFACE MODULE
M4
WIRELESS LAN/IF
170

FIG. 2

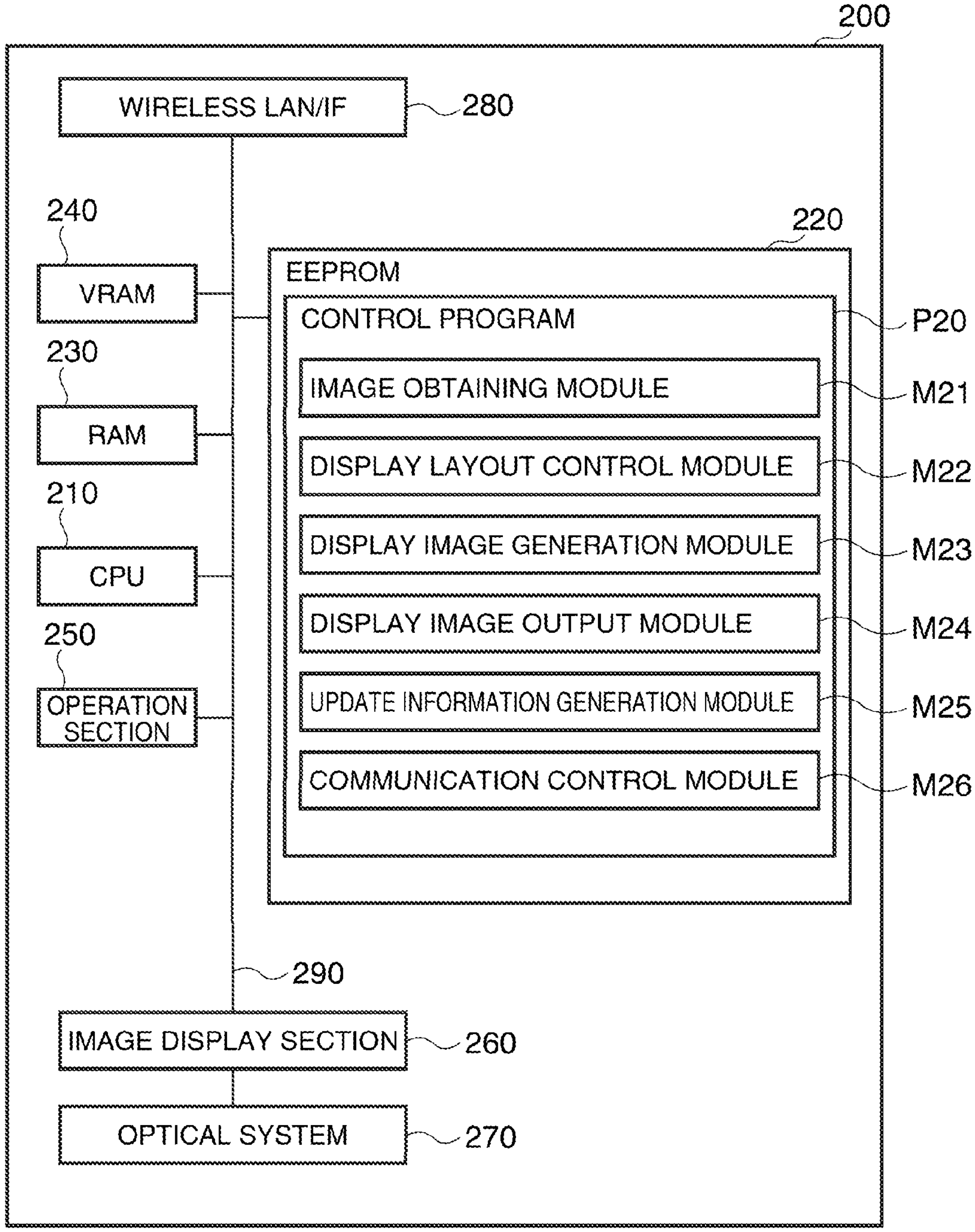

200
WIRELESS LAN/IF
280
240
VRAM
230
RAM
210
CPU
250
OPERATION SECTION
220
EEPROM
CONTROL PROGRAM
P20
IMAGE OBTAINING MODULE
M21
DISPLAY LAYOUT CONTROL MODULE
M22
DISPLAY IMAGE GENERATION MODULE
M23
DISPLAY IMAGE OUTPUT MODULE
M24
UPDATE INFORMATION GENERATION MODULE
M25
COMMUNICATION CONTROL MODULE
M26
290
IMAGE DISPLAY SECTION
260
OPTICAL SYSTEM
270

FIG. 3

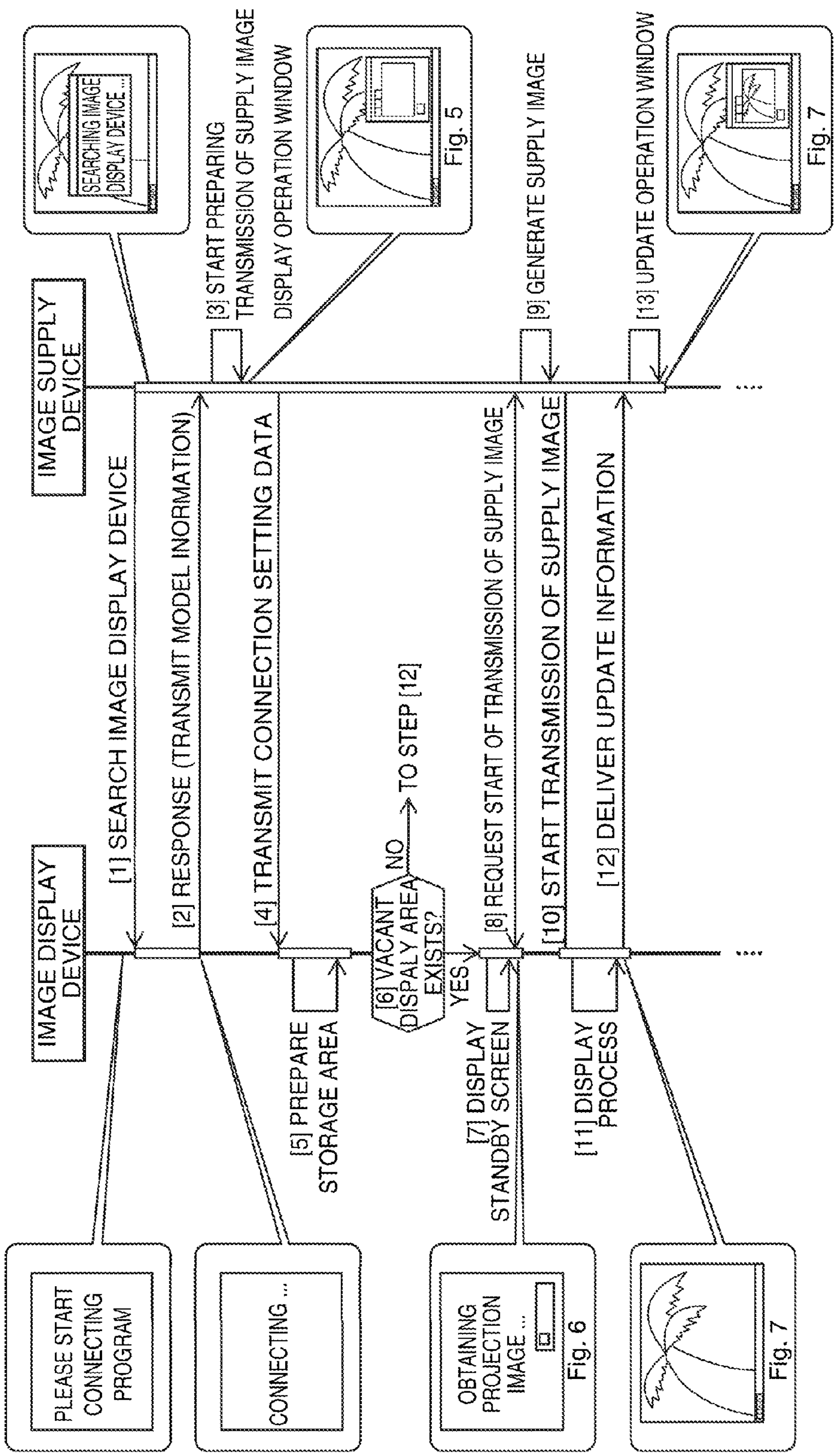


IMAGE DISPLAY DEVICE
IMAGE SUPPLY DEVICE
[1] SEARCH IMAGE DISPLAY DEVICE
[2] RESPONSE (TRANSMIT MODEL INORMATION)
[3] START PREPARING TRANSMISSION OF SUPPLY IMAGE
DISPLAY OPERATION WINDOW
[4] TRANSMIT CONNECTION SETTING DATA
[5] PREPARE STORAGE AREA
[6] VACANT DISPALY AREA EXISTS?
NO
TO STEP [12]
YES
[7] DISPLAY STANDBY SCREEN
[8] REQUEST START OF TRANSMISSION OF SUPPLY IMAGE
[9] GENERATE SUPPLY IMAGE
[10] START TRANSMISSION OF SUPPLY IMAGE
[11] DISPLAY PROCESS
[12] DELIVER UPDATE INFORMATION
[13] UPDATE OPERATION WINDOW
SEARCHING IMAGE DISPLAY DEVICE...
Fig. 5
Fig. 7
PLEASE START CONNECTING PROGRAM
CONNECTING ...
OBTAINING PROJECTION IMAGE ...
Fig. 6
Fig. 7

FIG. 4

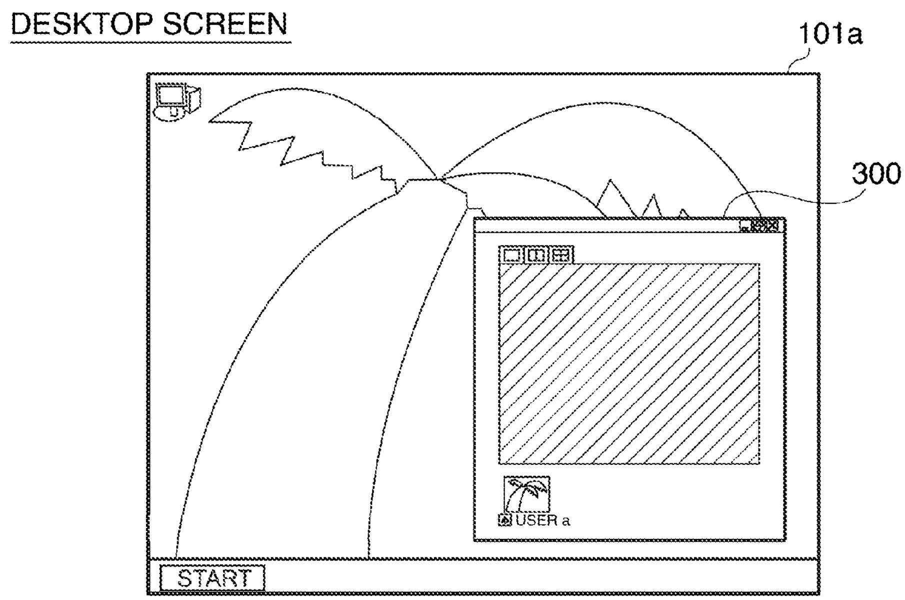

DESKTOP SCREEN
101a
300
USER a
START

FIG. 5A

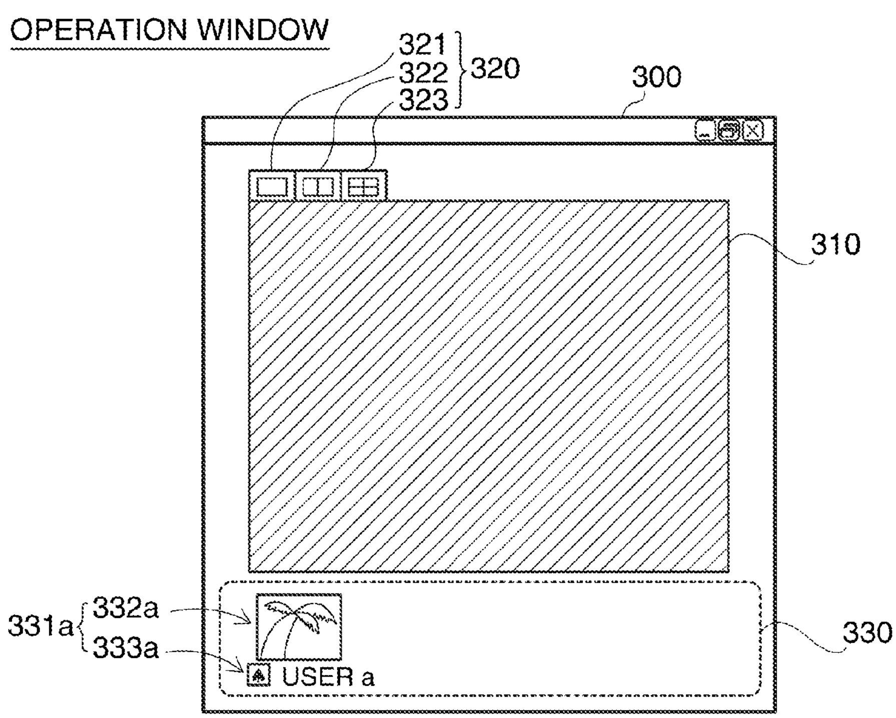

OPERATION WINDOW
321
322
323
320
300
310
331a
332a
333a
USER a
330

FIG. 5B

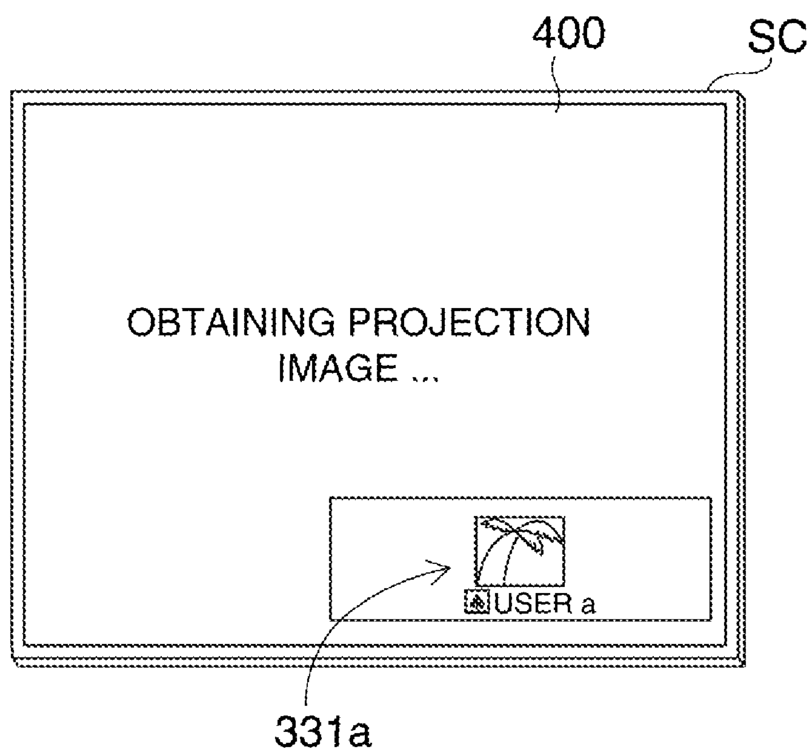


FIG. 6

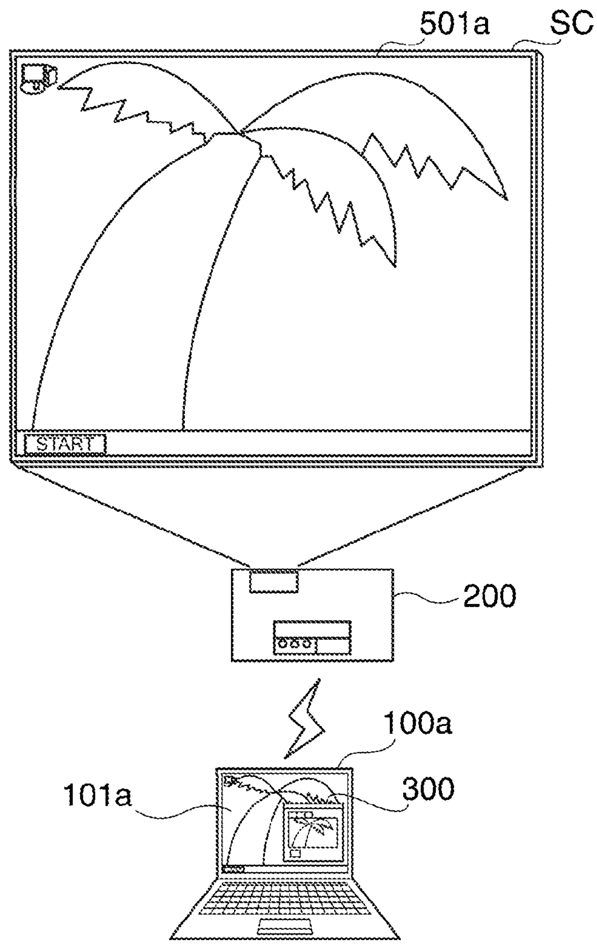

501a
SC
START
200
100a
101a
300

FIG. 7A

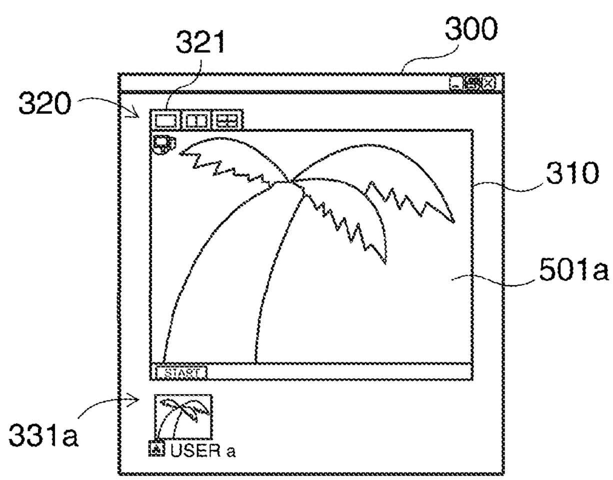

321
300
320
310
501a
START
331a
USER a

FIG. 7B

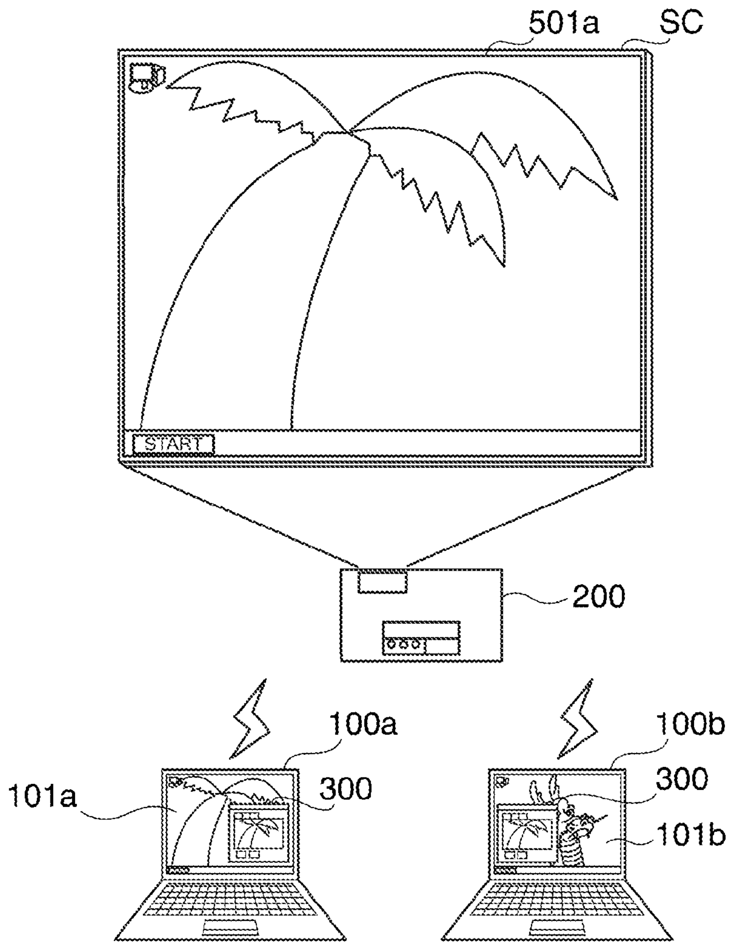

501a
SC
START
200
100a
100b
101a
300
300
101b

FIG. 8A

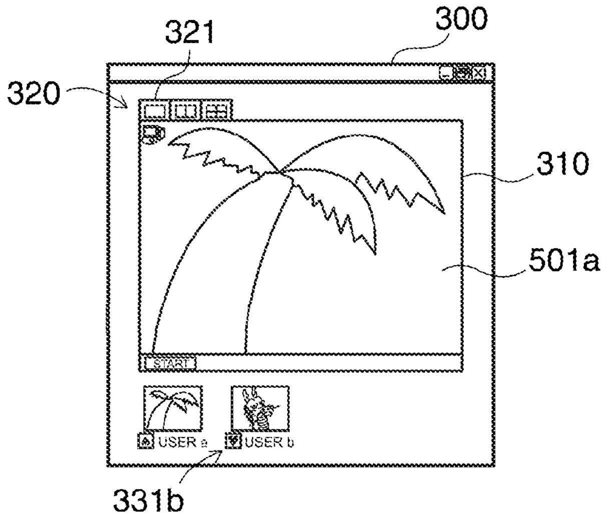

321
300
320
310
501a
START
USER a
USER b
331b

FIG. 8B

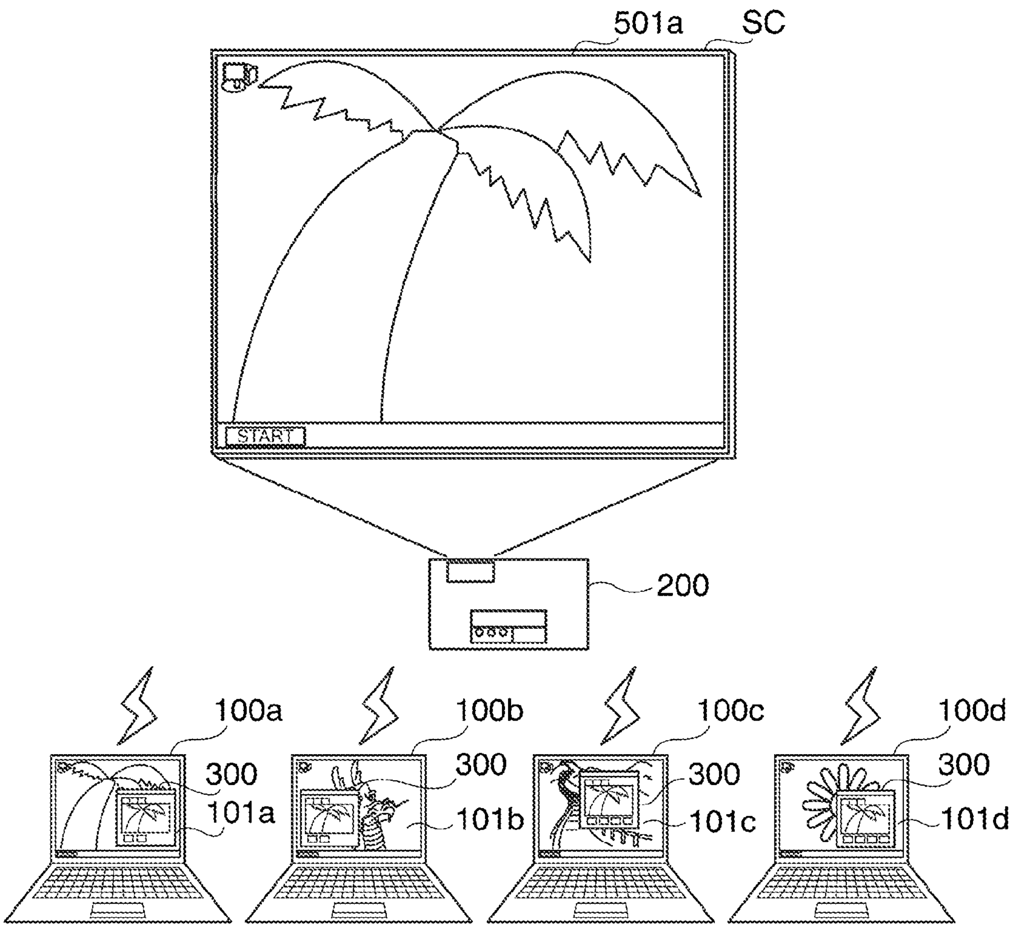

501a
SC
START
200
100a
100b
100c
100d
300
300
300
300
101a
101b
101c
101d

FIG. 9A

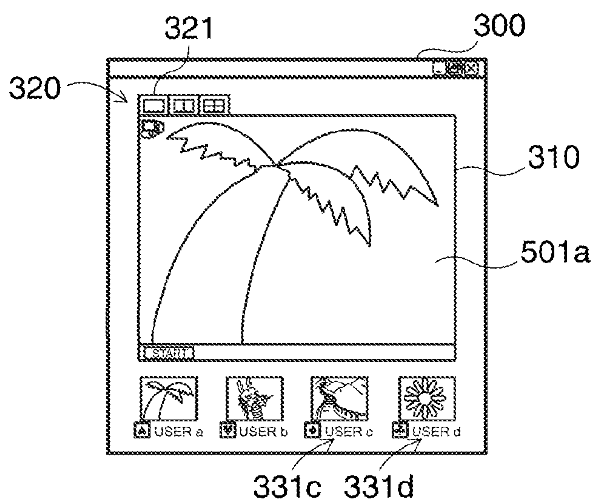

321
300
320
310
501a
START
USER a
USER b
USER c
USER d
331c
331d

FIG. 9B

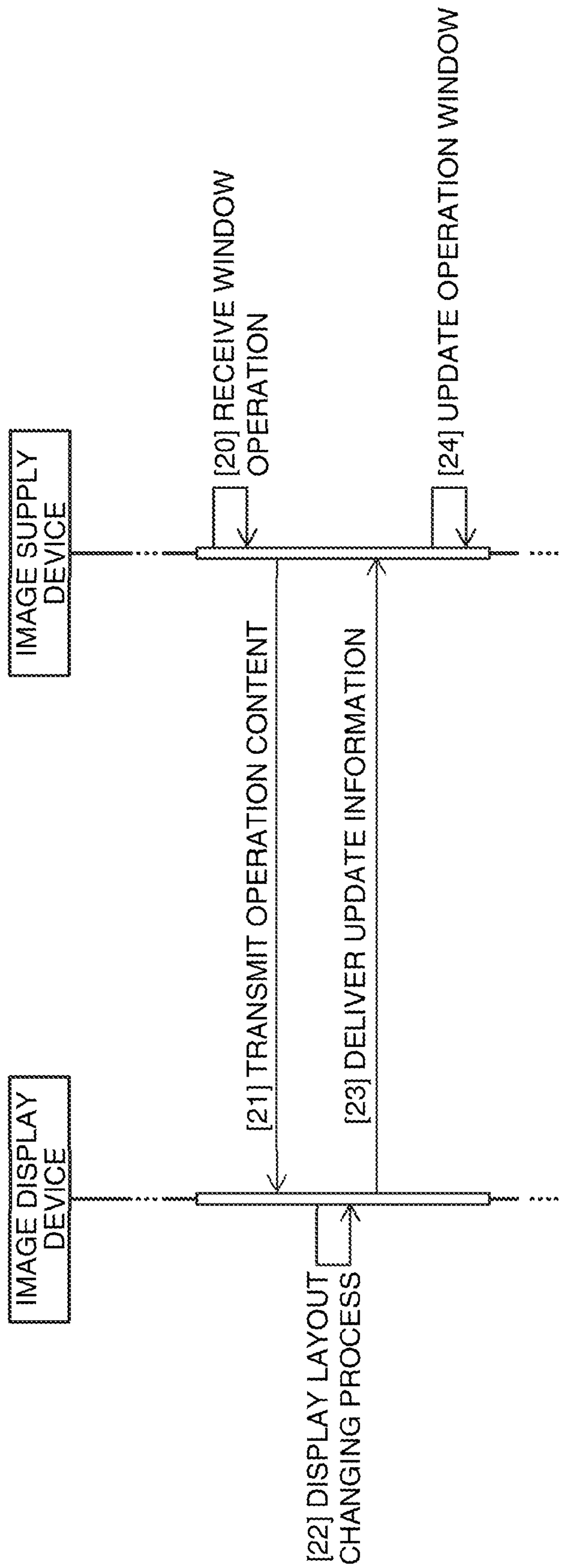


IMAGE SUPPLY DEVICE
IMAGE DISPLAY DEVICE
[20] RECEIVE WINDOW OPERATION
[21] TRANSMIT OPERATION CONTENT
[22] DISPLAY LAYOUT CHANGING PROCESS
[23] DELIVER UPDATE INFORMATION
[24] UPDATE OPERATION WINDOW

FIG. 10

FIG. 11A

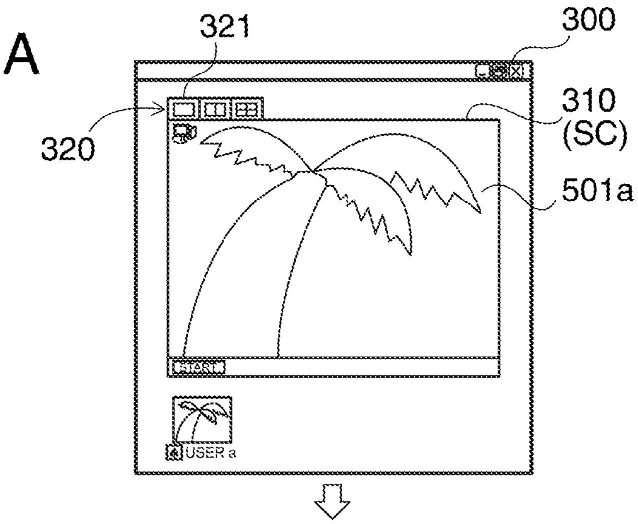


FIG. 11B

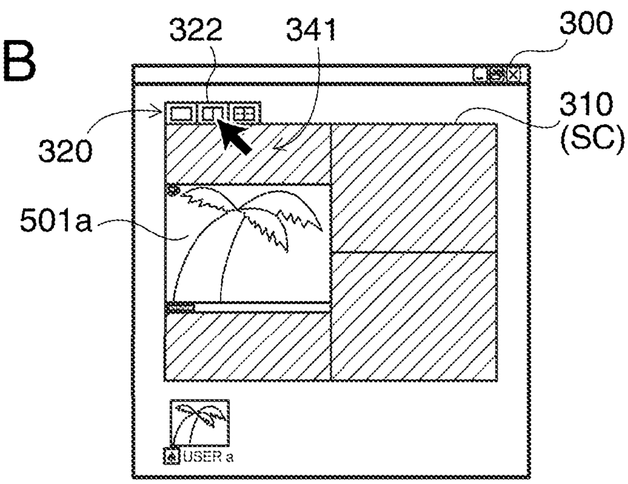
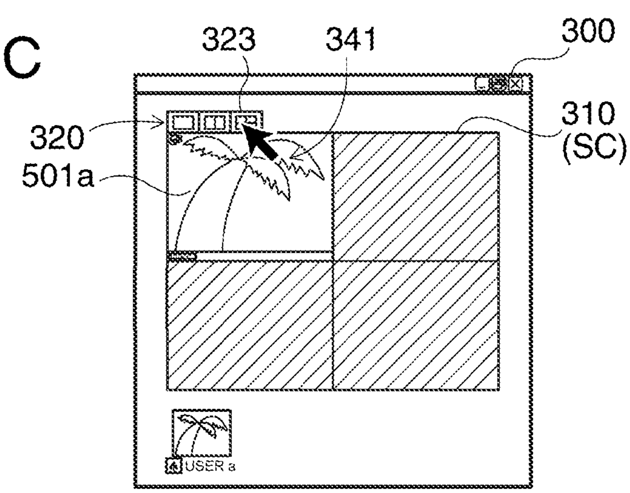


FIG. 11C



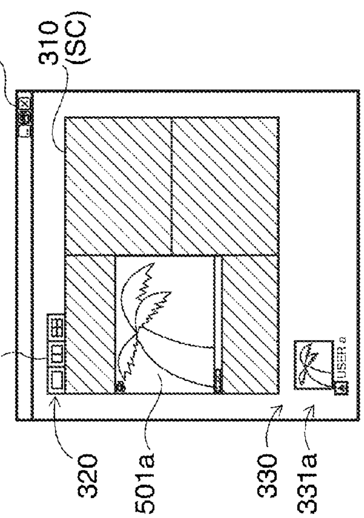


FIG. 12A1

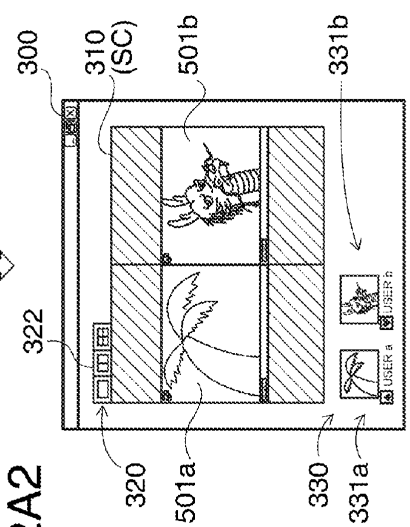


FIG. 12A2

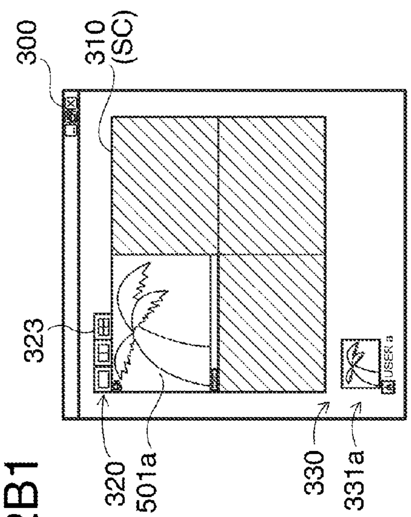


FIG. 12B1

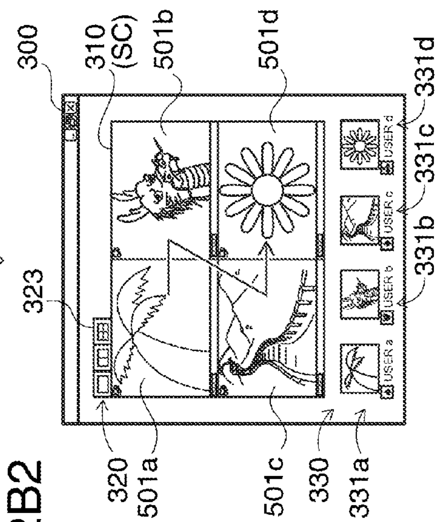


FIG. 12B2

FIG. 13A

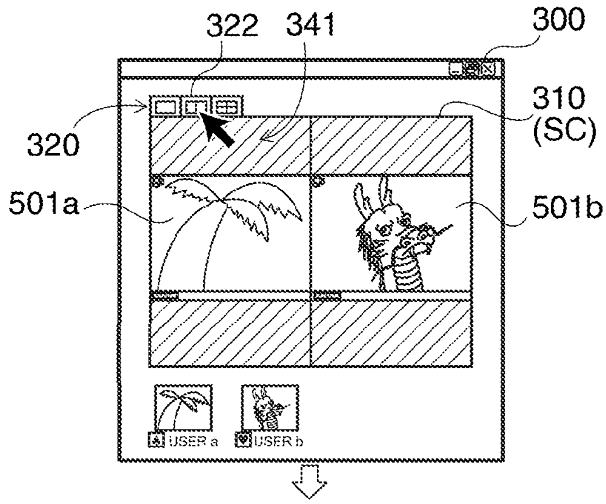


FIG. 13B

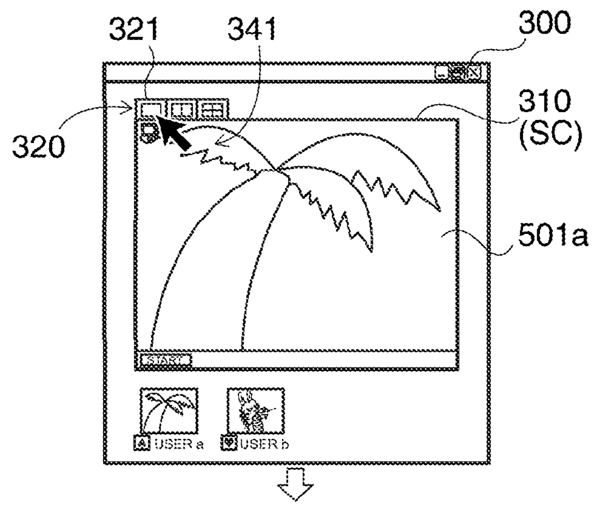
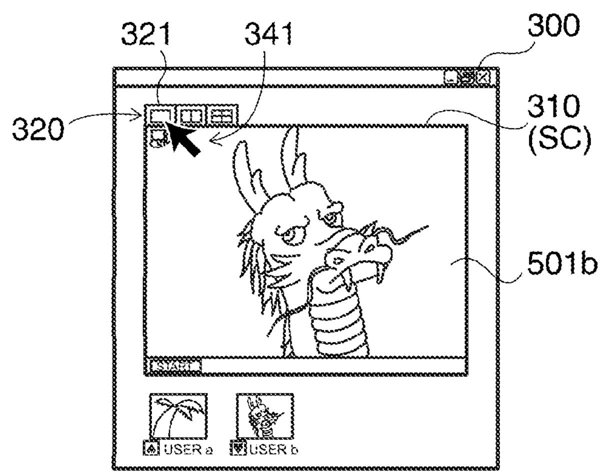


FIG. 13C



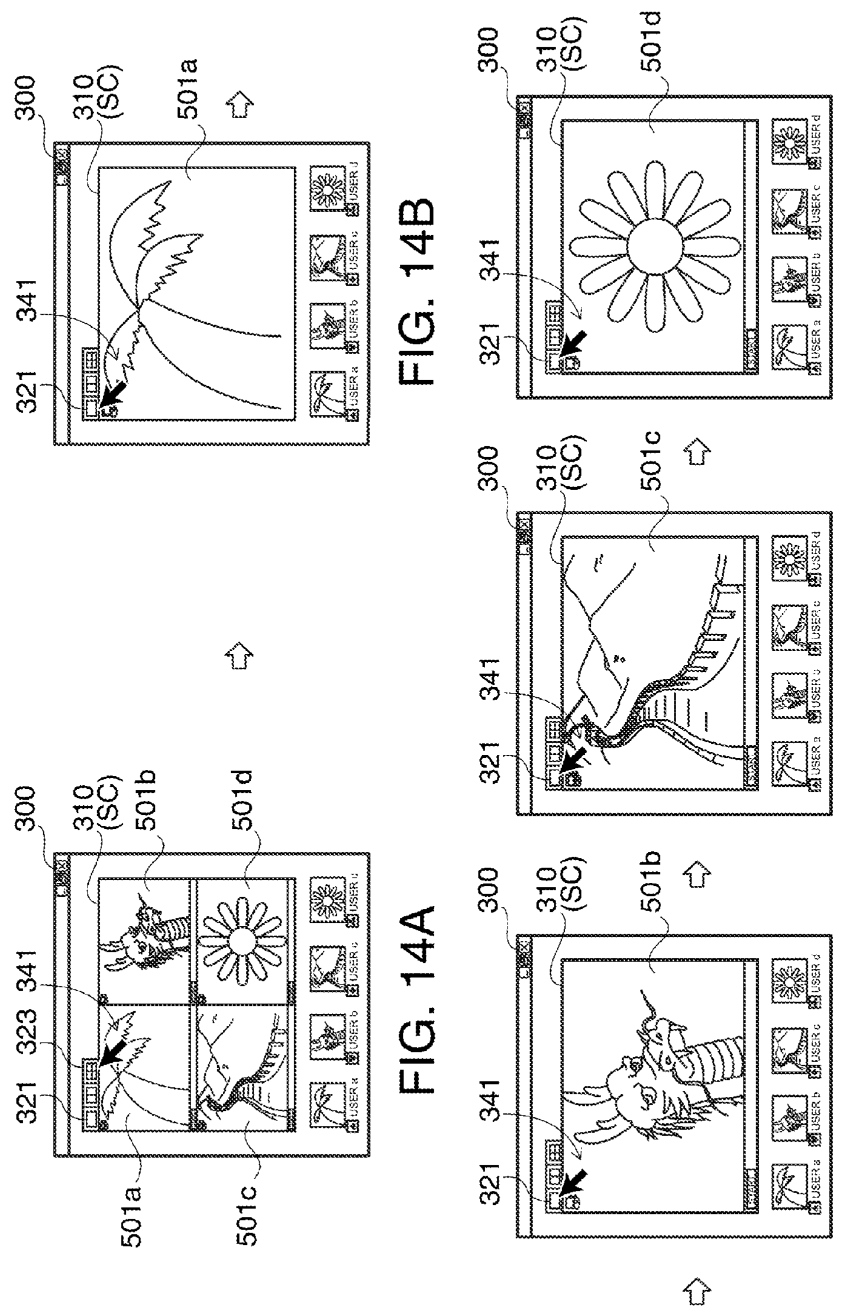


FIG. 14A

FIG. 14B

FIG. 14C

FIG. 14D

FIG. 14E

FIG. 15A1

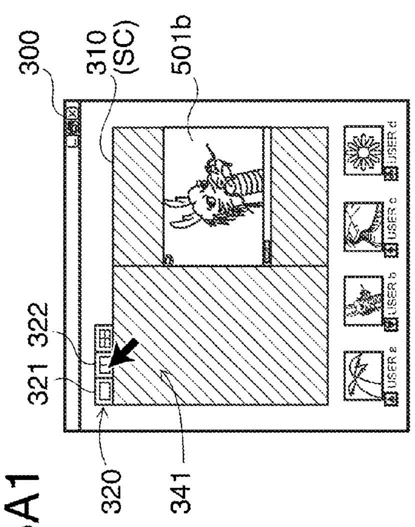


FIG. 15A2

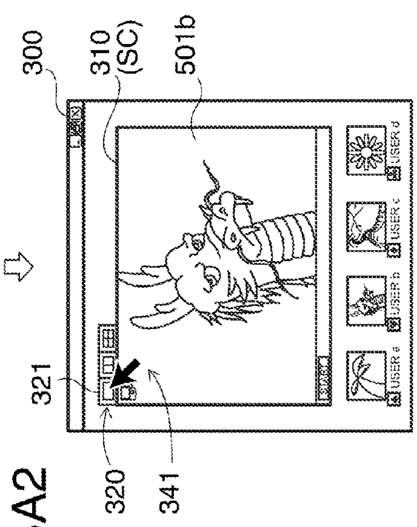


FIG. 15B1

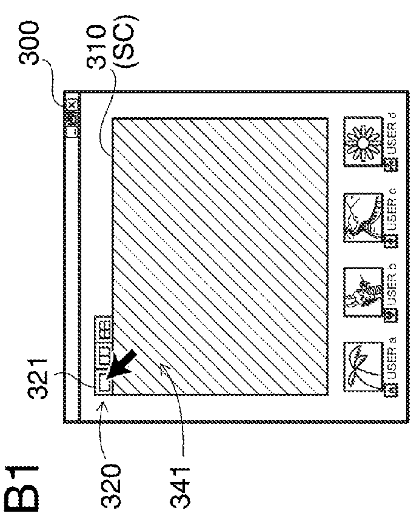
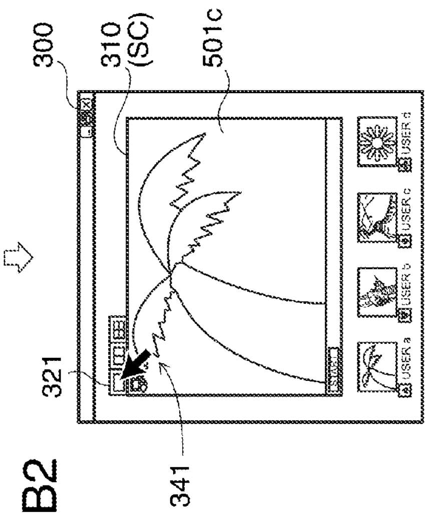


FIG. 15B2



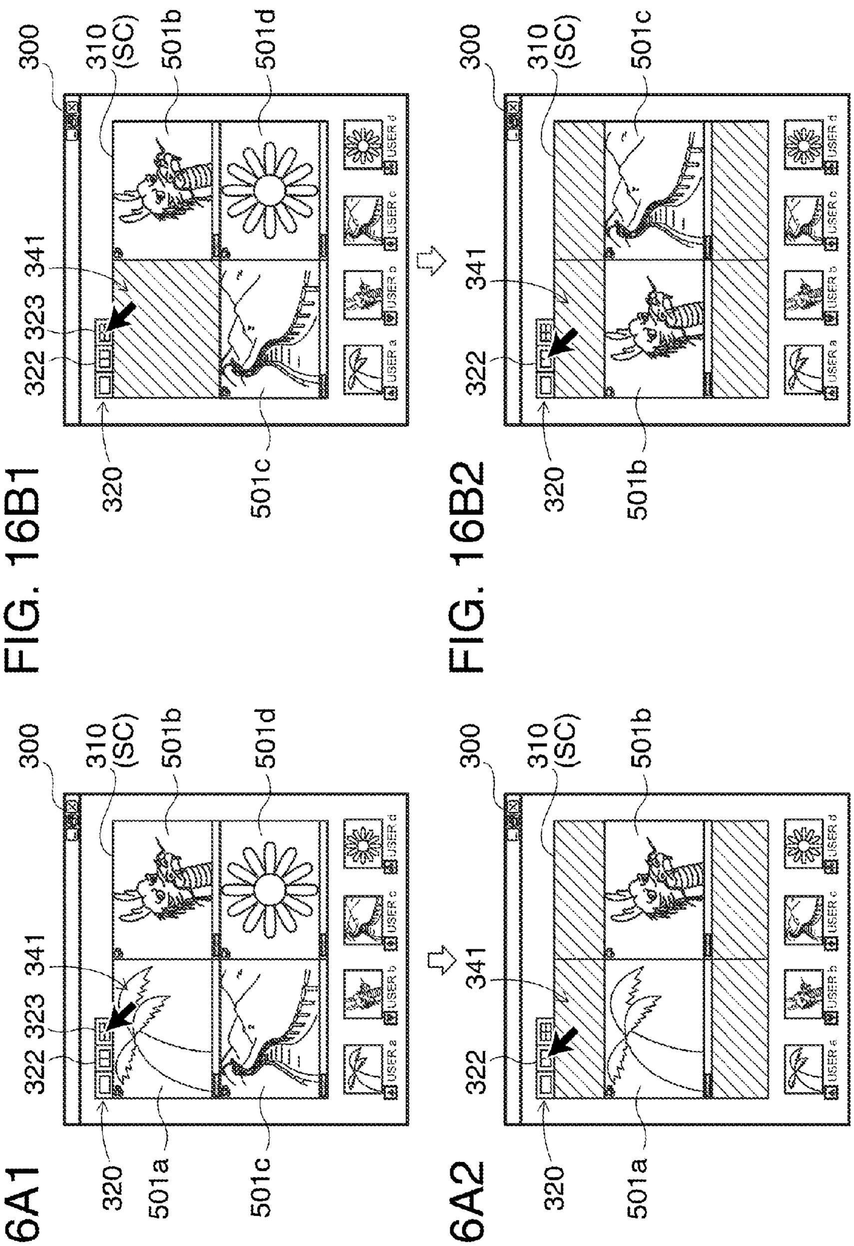


FIG. 16A1

FIG. 16A2

FIG. 16B1

FIG. 16B2

FIG. 17A1

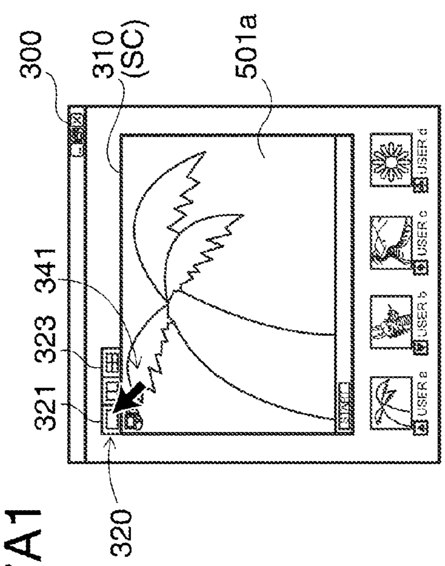


FIG. 17A2

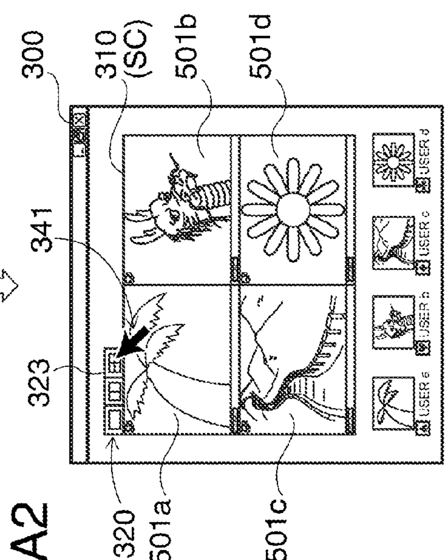


FIG. 17B1

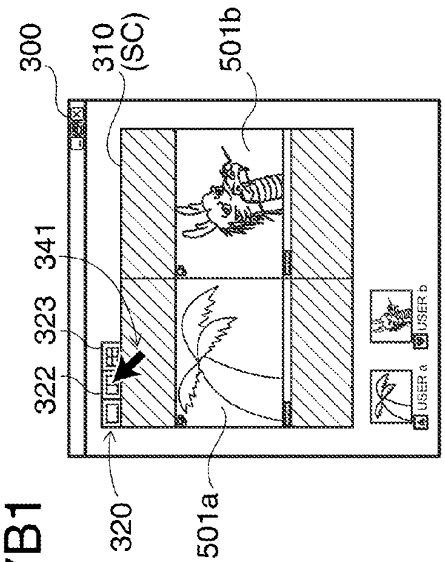


FIG. 17B2

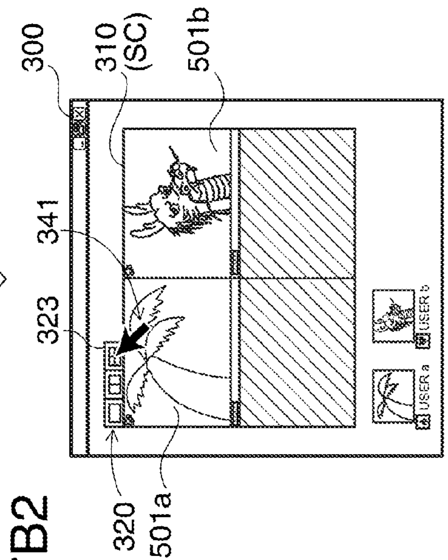


FIG. 18A1

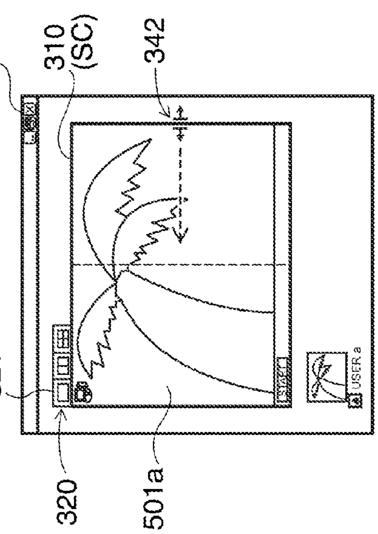


FIG. 18A2

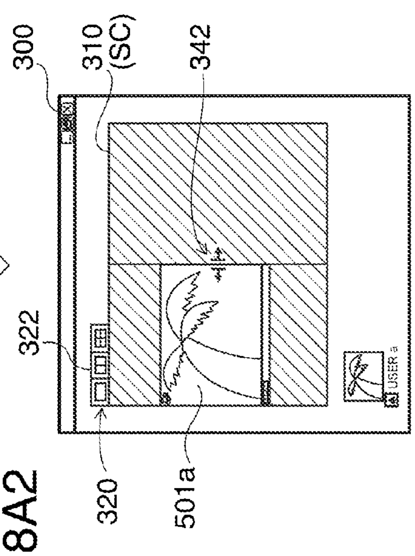


FIG. 18B1

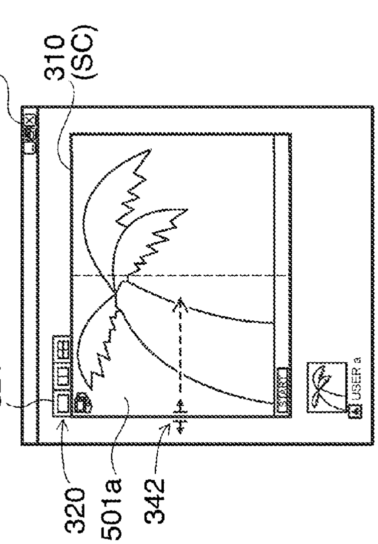


FIG. 18B2

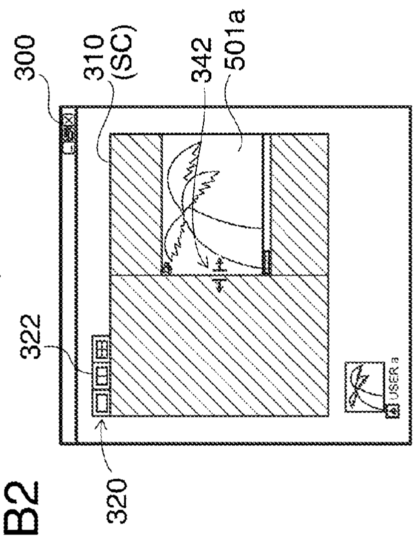


FIG. 19A1

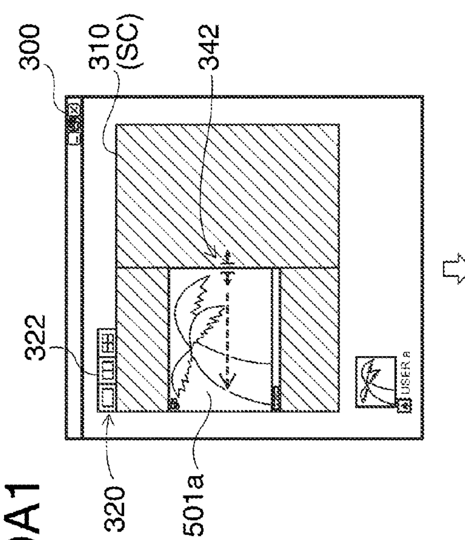


FIG. 19B1

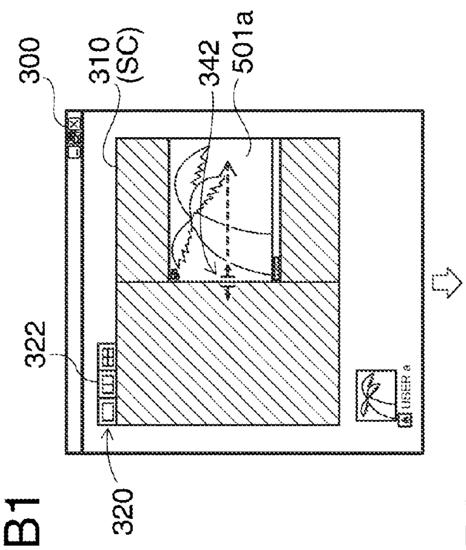


FIG. 19A2

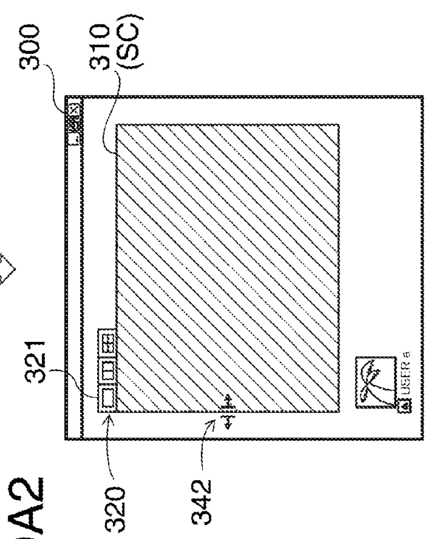


FIG. 19B2

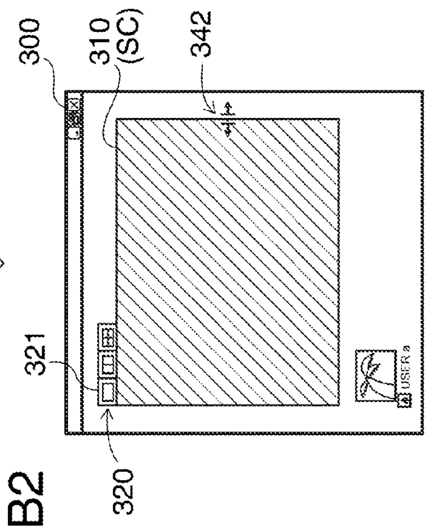


FIG. 20A1

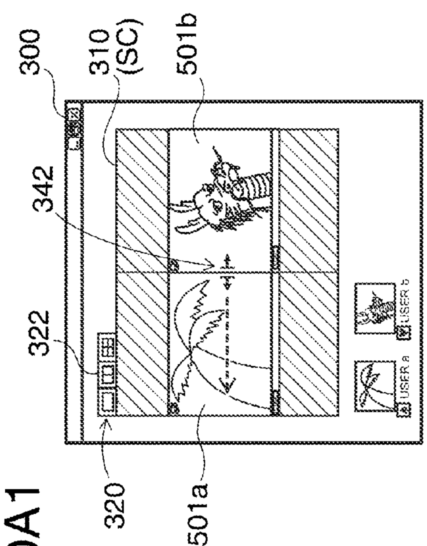


FIG. 20A2

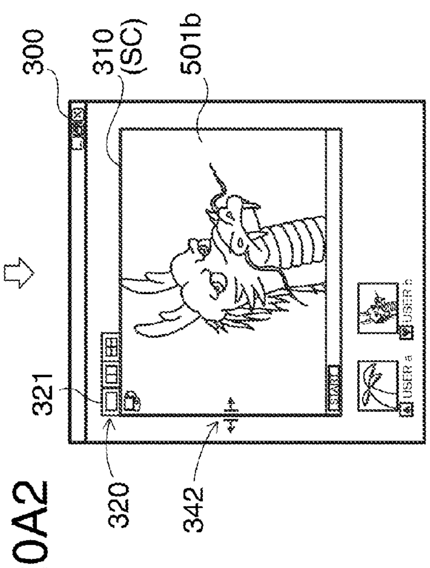


FIG. 20B1

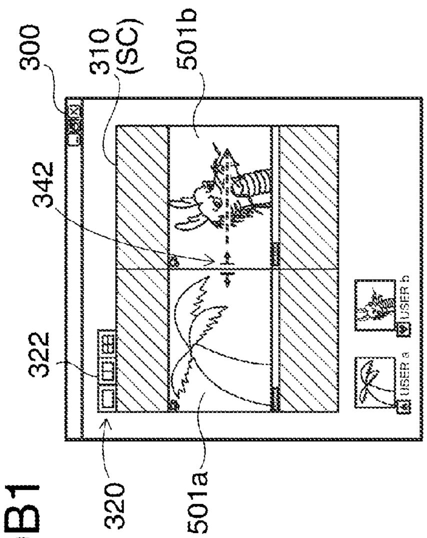


FIG. 20B2

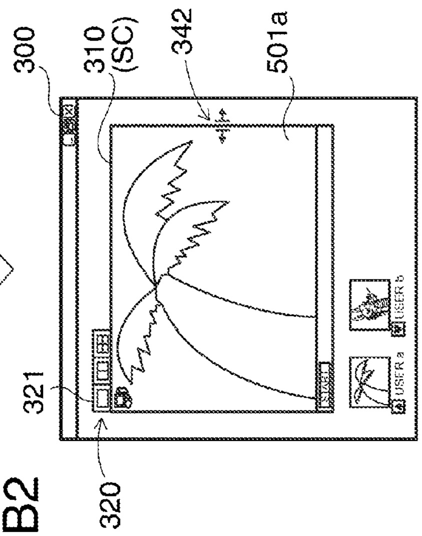


FIG. 21A1

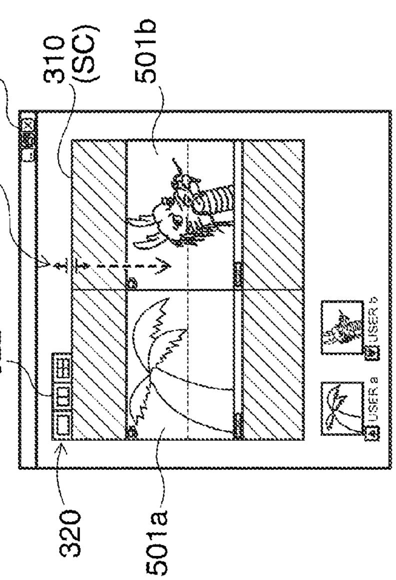


FIG. 21A2

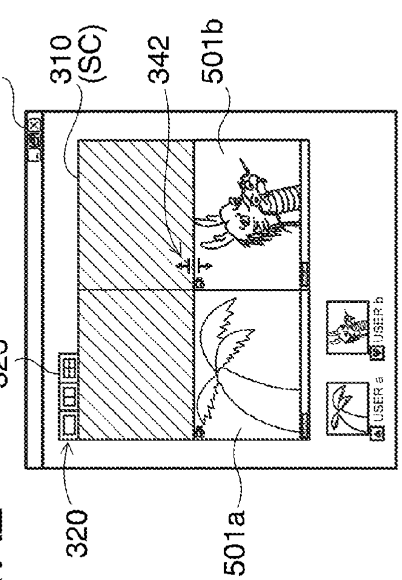


FIG. 21B1

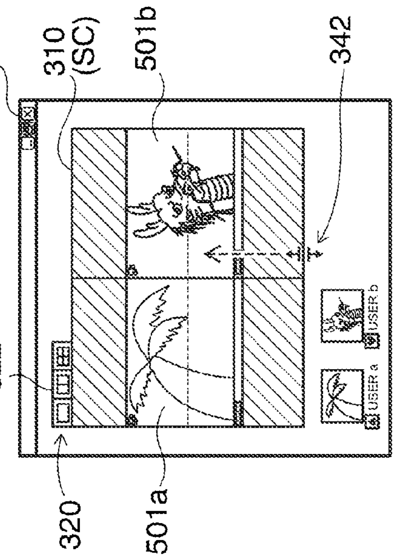


FIG. 21B2

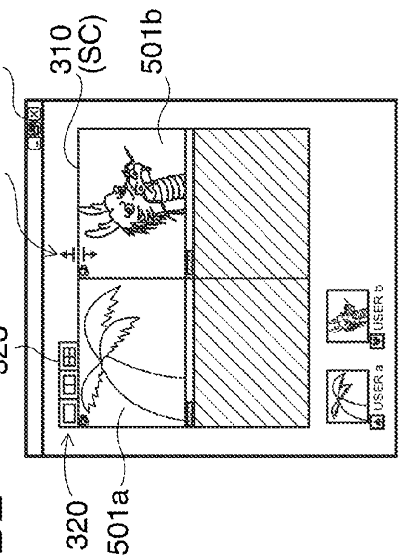


FIG. 22A1

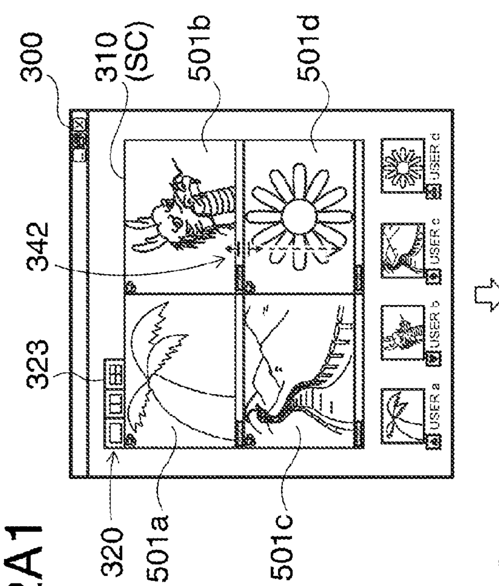


FIG. 22A2

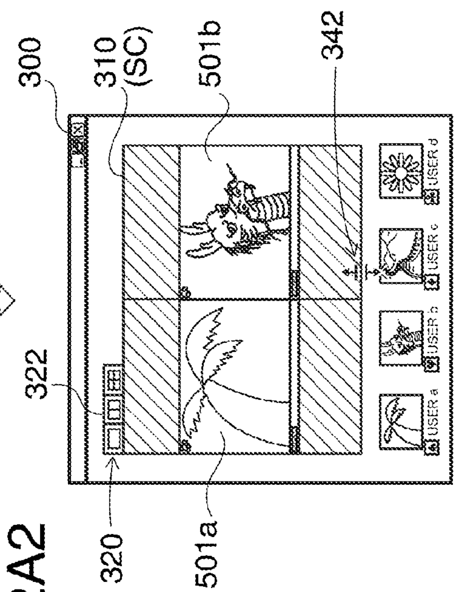


FIG. 22B1

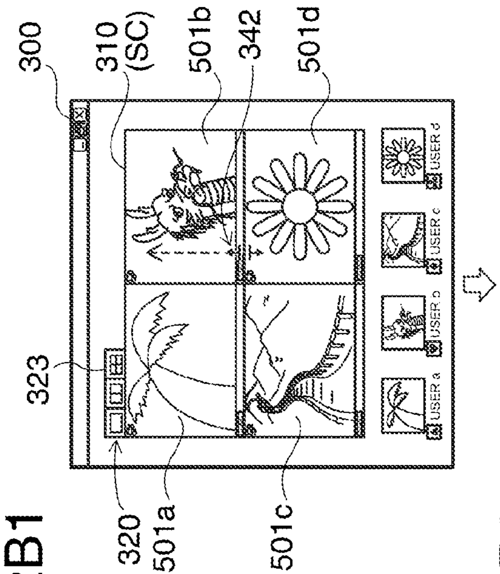


FIG. 22B2

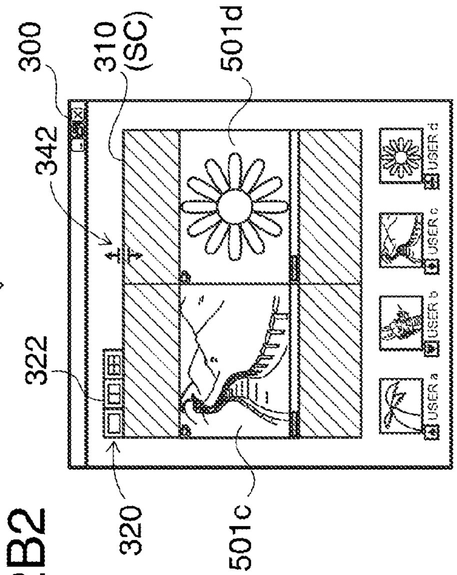


FIG. 23A1

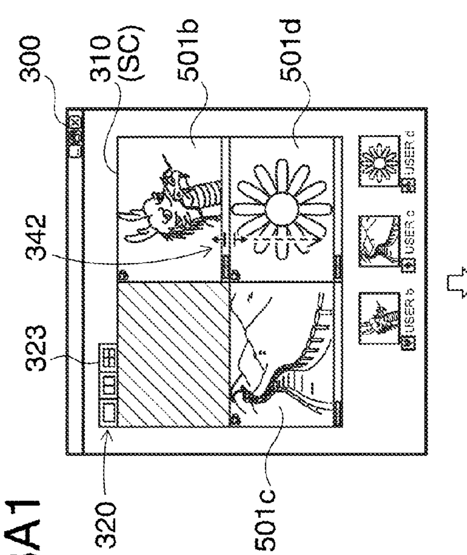


FIG. 23A2

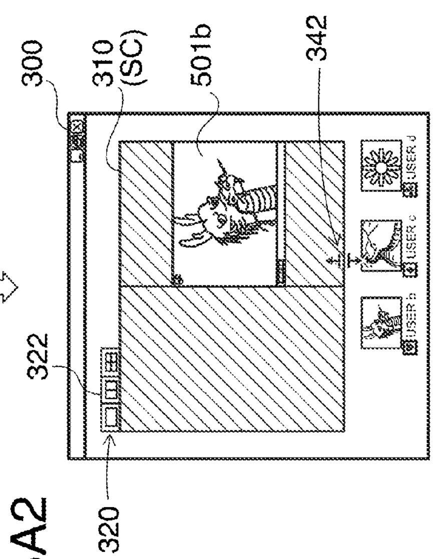


FIG. 23B1

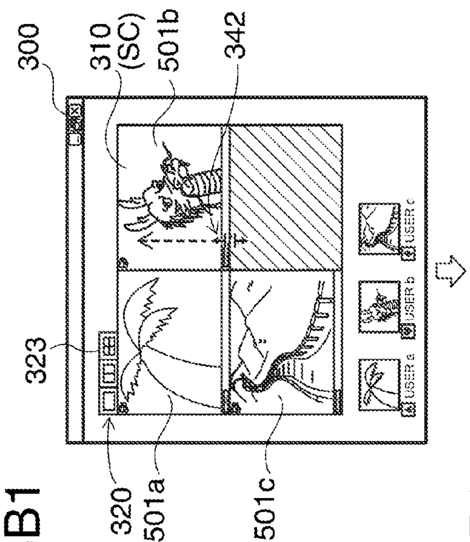


FIG. 23B2

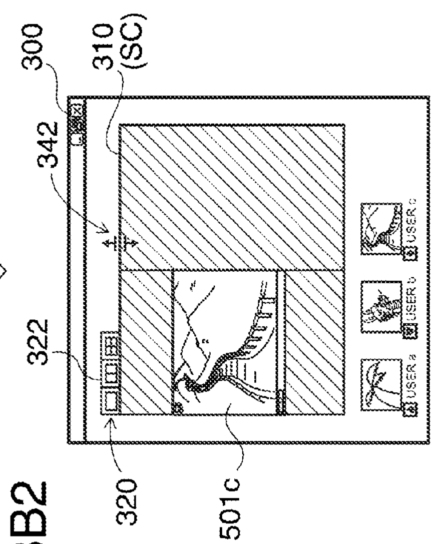


FIG. 24A1

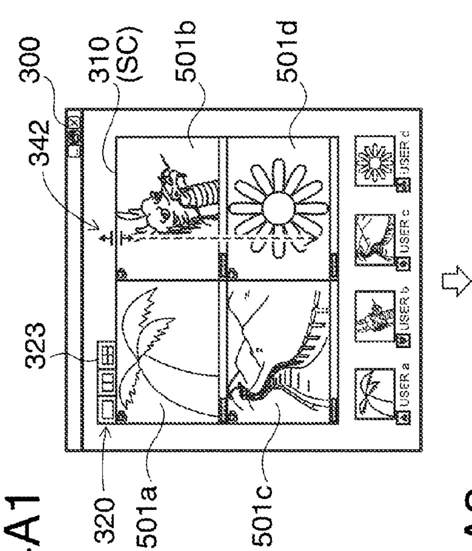


FIG. 24A2

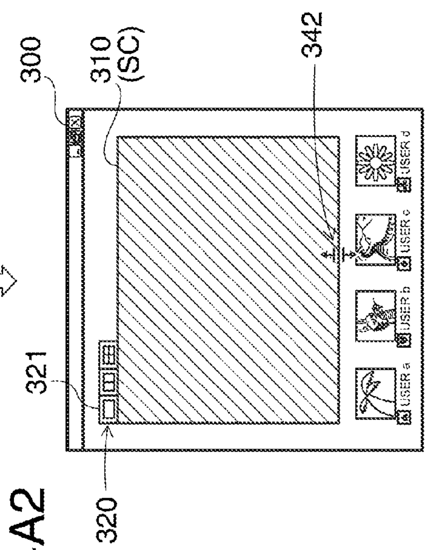


FIG. 24B1

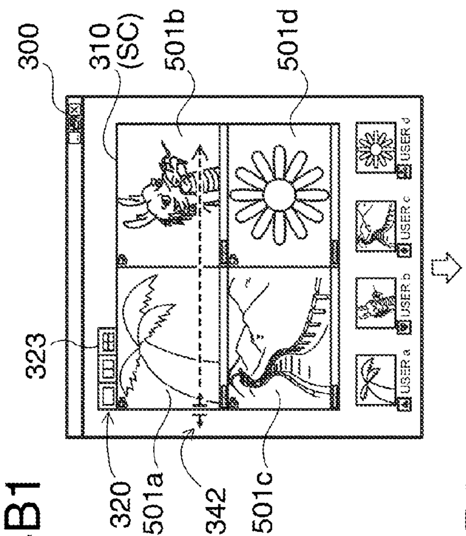


FIG. 24B2

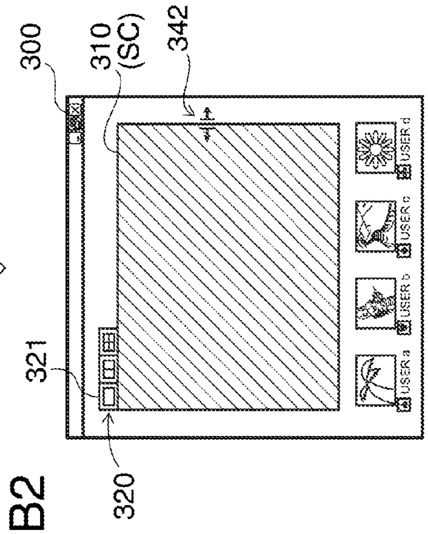


FIG. 25A1

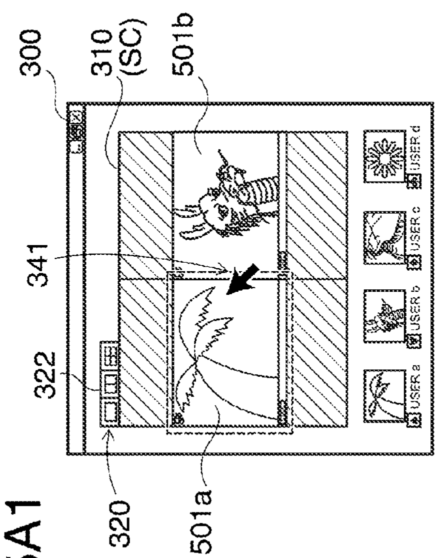


FIG. 25B1

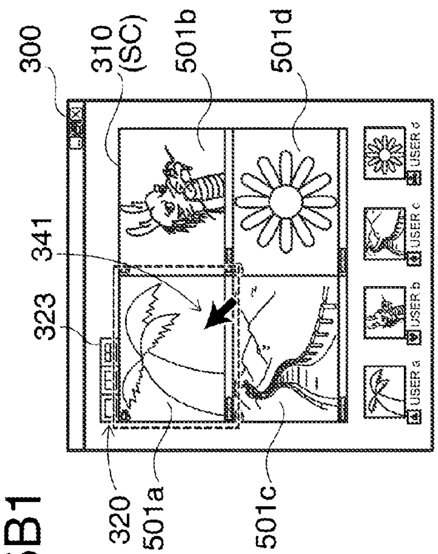


FIG. 25A2

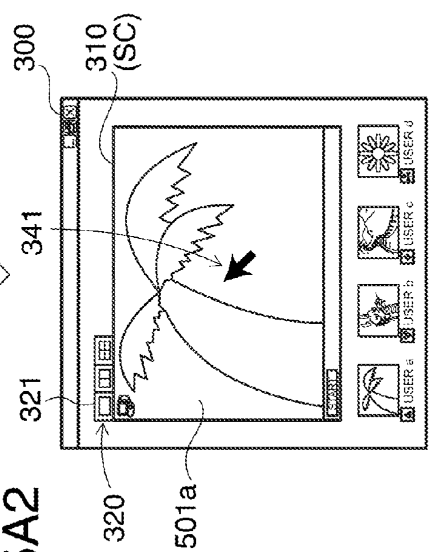


FIG. 25B2

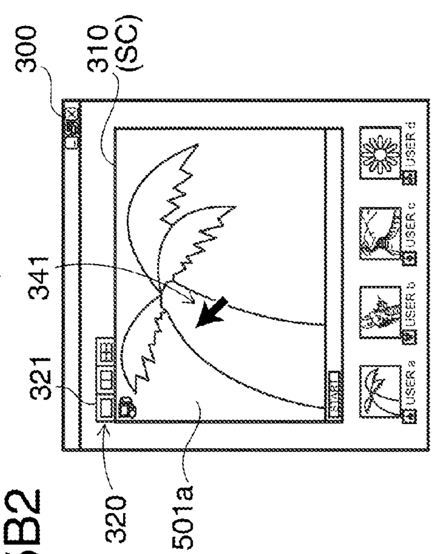


FIG. 26A1

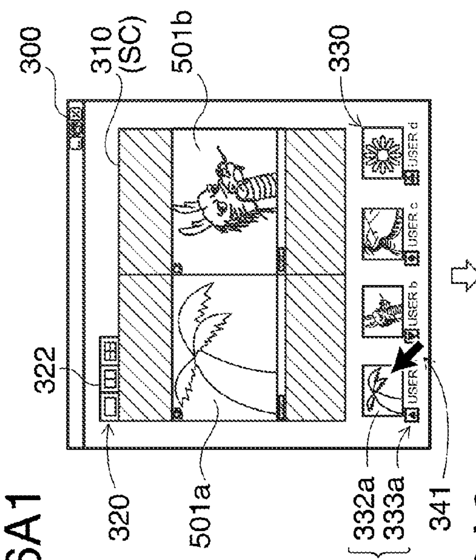


FIG. 26B1

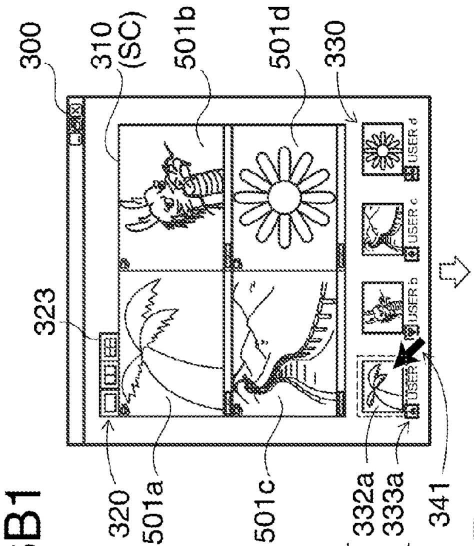


FIG. 26A2

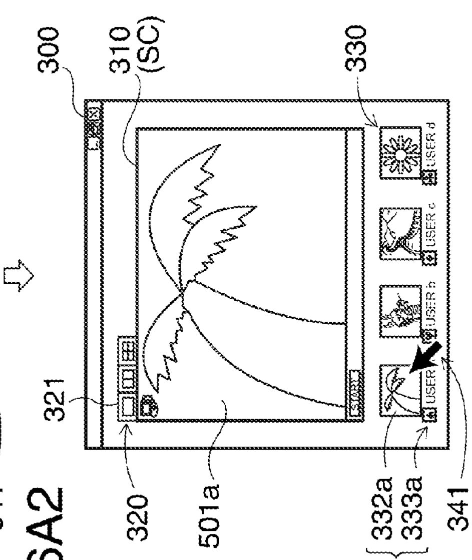
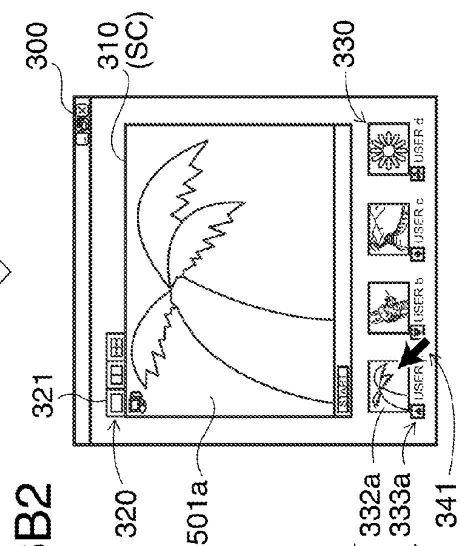


FIG. 26B2



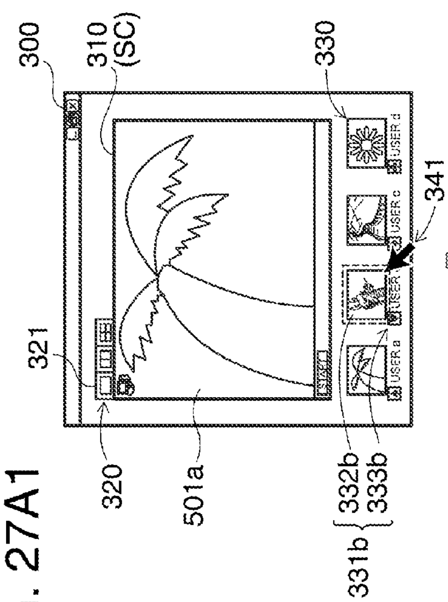


FIG. 27A1

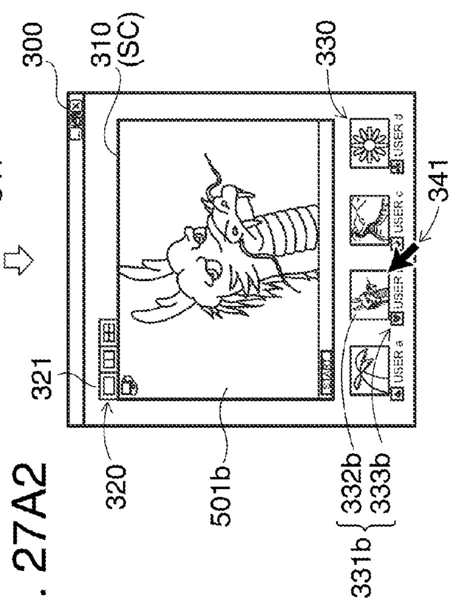


FIG. 27A2

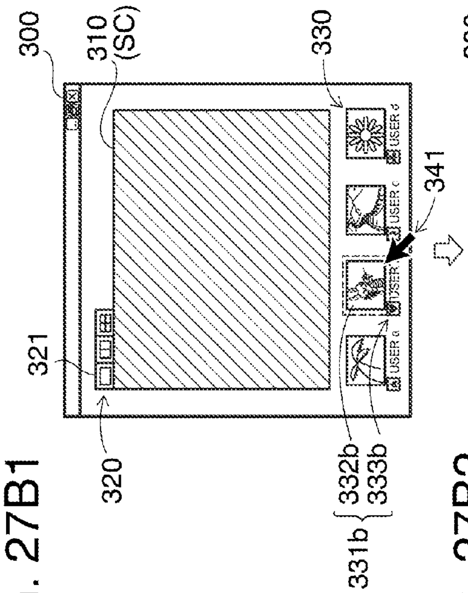


FIG. 27B1

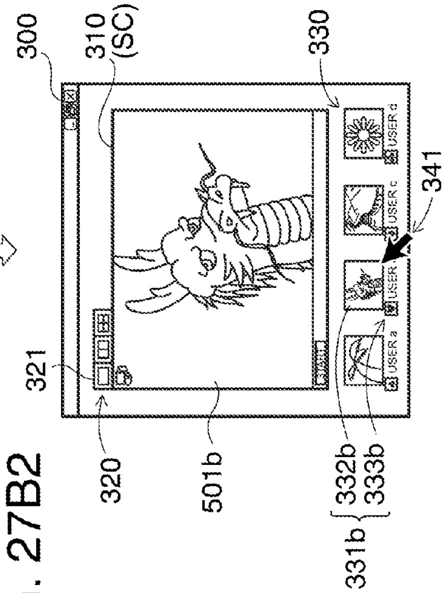


FIG. 27B2

FIG. 28A

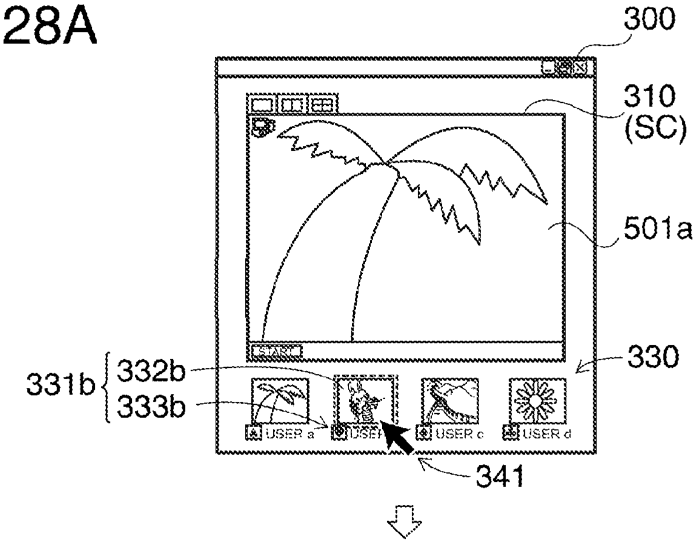


FIG. 28B

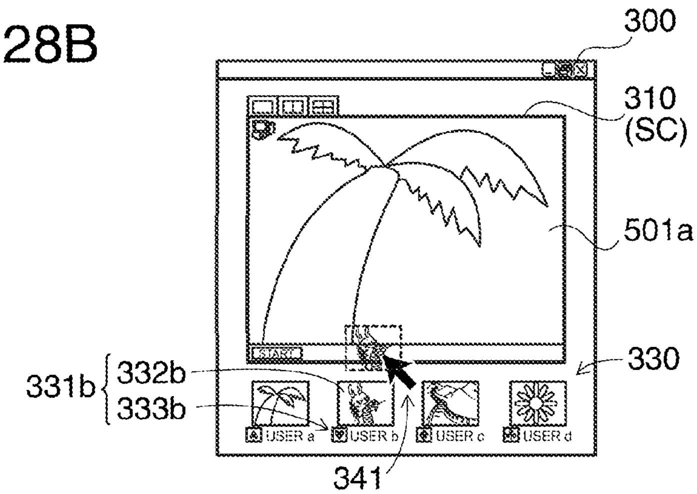


FIG. 28C

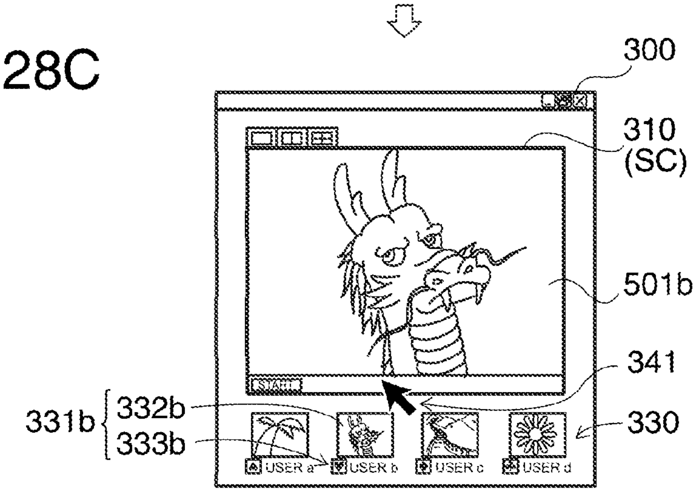


FIG. 29A1

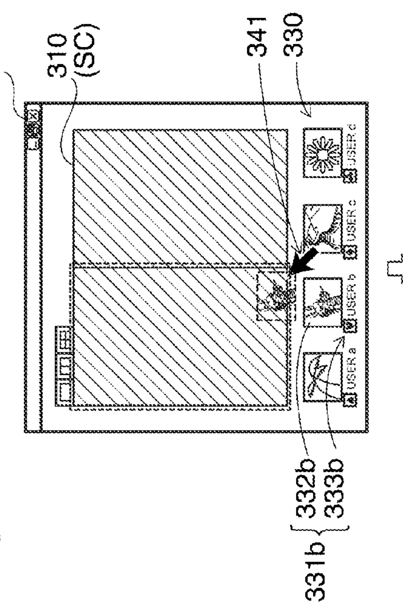


FIG. 29B1

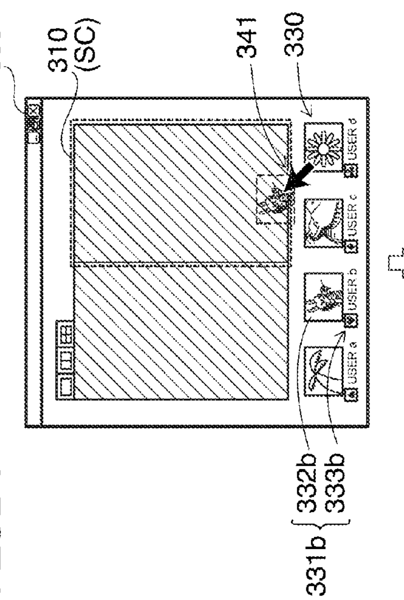


FIG. 29A2

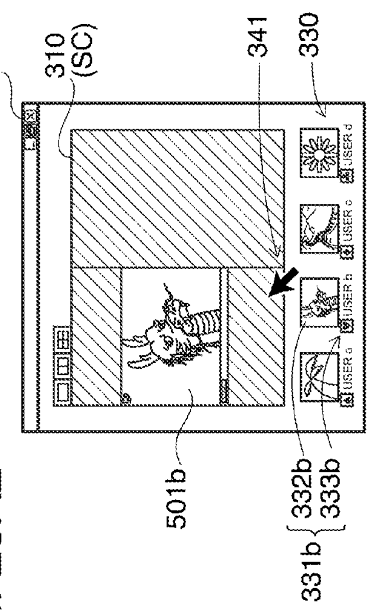


FIG. 29B2

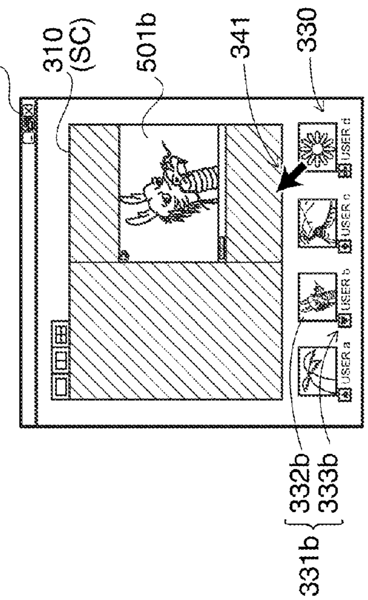


FIG. 30A1

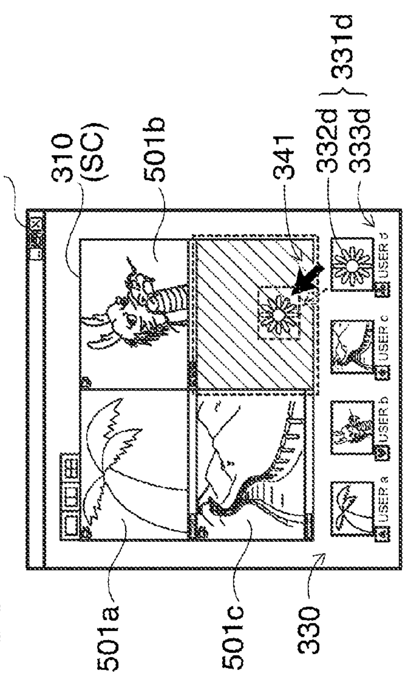


FIG. 30A2

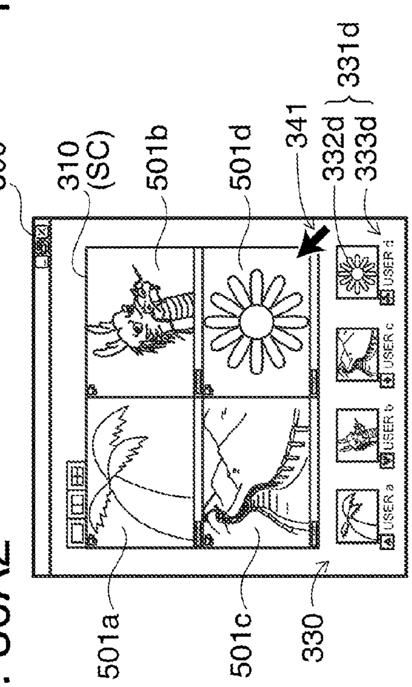


FIG. 30B1

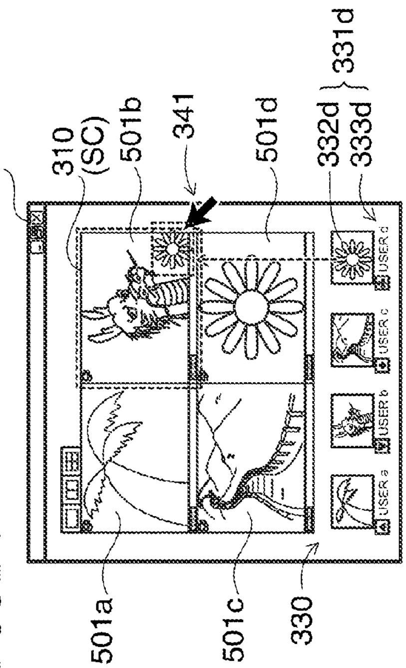


FIG. 30B2

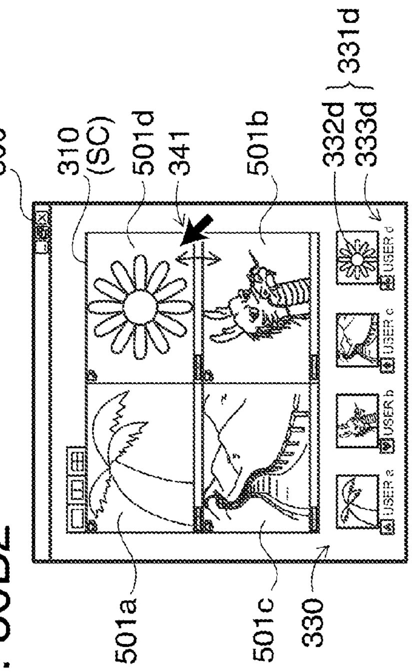


FIG. 31A

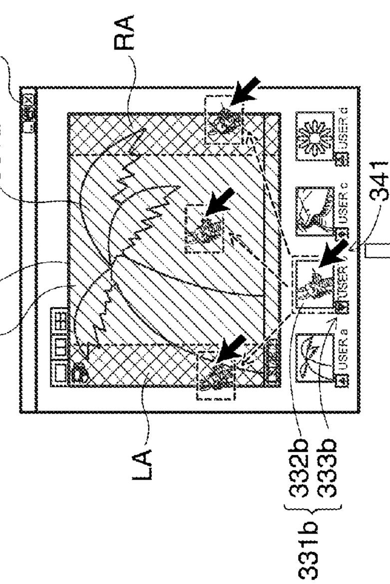


FIG. 31B1

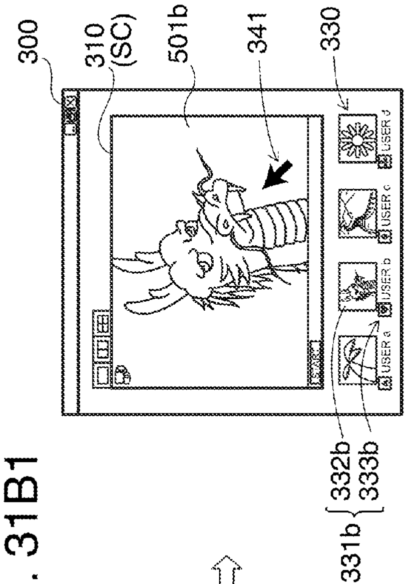


FIG. 31B2

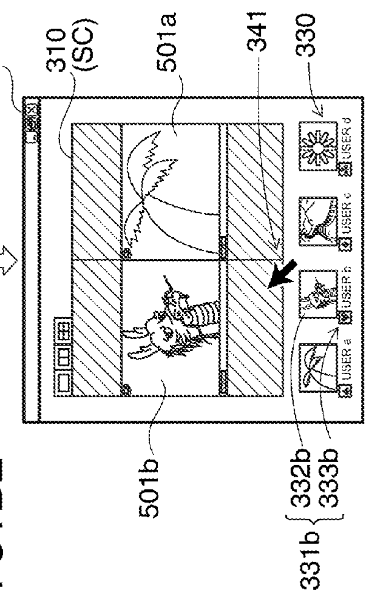
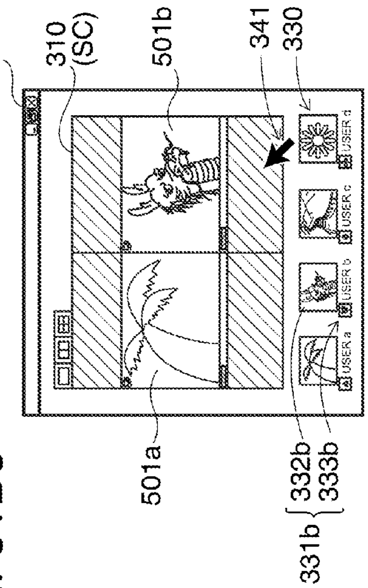


FIG. 31B3



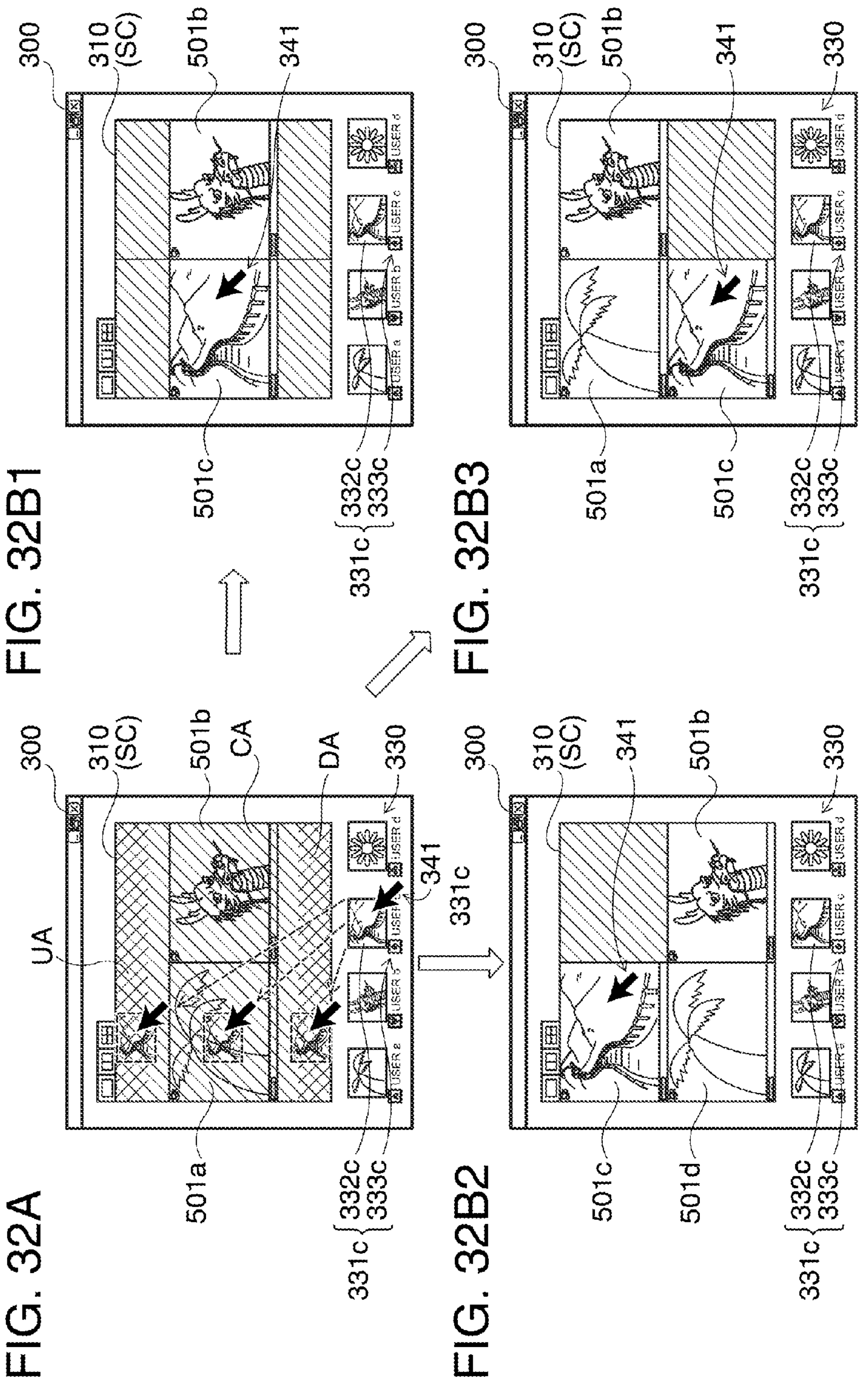


FIG. 32A

FIG. 32B1

FIG. 32B2

FIG. 32B3

IMAGE DISPLAY SYSTEM, IMAGE DISPLAY DEVICE, AND IMAGE DISPLAY METHOD

CROSS-REFERENCE

[0001] The present application claims priority from Japanese Patent Application No. 2009-129922 filed on May 29, 2009, which is hereby incorporated by reference in its entirety.

BACKGROUND

[0002] In presentations, conferences, or the like, in some cases, there is used an image display system capable of displaying a display screen of a terminal such as a personal computer operated by each of a plurality of participants on a common screen area, which can be viewed by all of the participants. In International Patent publication WO2005/088602, there is proposed a technology of dividing the projection screen into a plurality of image areas, and arranging the images transmitted from a plurality of image generation devices to an image projection device to the respective image areas thus divided to thereby project the respective images at the same time. Japanese Patent No. 4010198 is another example of a related art document.

[0003] Incidentally, in presentations or conferences, in general, roles of the participants are replaced with each other flexibly such as a presenter and a speaker changed in a rotating manner. Therefore, in the case in which the display screens of the terminals of the respective participants are displayed on the common screen area thus divided, it is preferable in terms of effective presentation and invigoration of discussion that the operation of changing the layout of the common screen area can be performed efficiently. However, it is very much a situation in which a sufficient devise has not ever been provided to improvement of the convenience of such an image display system.

SUMMARY

[0004] Various embodiments may provide a technology of improving convenience on the operation of changing display contents of a screen in an image display system for arranging supplied images transmitted from a plurality of image supply devices on a common screen area and then displaying them thereon.

Application Example 1

[0005] According to at least one embodiment of the disclosure, there is provided an image display system having a common screen area allowing a plurality of users to view a common image, including a plurality of image supply devices each having an image display section, and an image transmission section adapted to generate a supply image using an image displayed in the image display section and to externally transmit the supply image, and an image display device capable of dividing the common screen area into one or more screen areas, and of displaying the supply image supplied from each of the plurality of image supply devices in the one or more screen areas, wherein each of the image supply devices displays a common screen area operating image allowing the user to operate a display state of the common screen area in the image display section, and supplies a display image of the image display section to the image display device as the supply image, and the image display device changes the display state of the common screen area in accordance with an operation by the user in each of the image supply devices via the common screen area operating image.

[0006] According to the image display system of this embodiment, each of the users of the respective image supply devices can change the display content of the common screen area via the common screen area operating image. Therefore, since each of the users can arbitrarily change the display content of the common screen area, convenience for each of the users can be improved. Further, although the supply image generated using the display image in each of the image supply devices is displayed on the common screen area, the supply image does not include the common screen area operating image. Therefore, since each of the users can display only a desired image on the common screen area, convenience for the each user is further improved.

Application Example 2

[0007] The image display system according to the application example 1, wherein the common screen area operating image includes a layout image having divisional layout frames showing a configuration of one or more screen areas in the common screen area, the divisional layout frames can be changed by an operation by the user on the common screen area operating image, and the image display device performs display after changing a configuration of the one or more screen areas in the common screen area in accordance with the change of the divisional layout frames.

[0008] According to the image display system of this embodiment, since each of the users can arbitrarily change the screen configuration of the common screen area, convenience for each of the users can be improved.

Application Example 3

[0009] The image display system according to the application example 2, wherein the image display device generates new divisional layout frames in response to the user performing an operation of dragging a boundary between the divisional layout frames into an area in the layout frame on the common screen area operating image, and the image display device deletes the divisional layout frames in response to the user performing an operation of dragging the boundary existing between the divisional layout frames out of the layout image on the common screen area operating image.

[0010] According to the image display system of this embodiment, each of the user can increase or decrease the divisional layout frames by dragging the boundary between the divisional layout frames on the common screen area operating image. Therefore, since each of the users can arbitrarily change the display layout of the common screen area, convenience for each of the users can be improved.

Application Example 4

[0011] The image display system of any one of the application examples 2 and 3, wherein the common screen area operating image has an identification image list area adapted to display a list of identification images for identifying the supply images supplied from the image supply devices, and the image display device displays the supply image identified by the identification image selected by the user in the identification image list area on the common screen area operating image.

[0012] According to the image display system of this embodiment, by arbitrarily selecting the identification image representing the supply image in the identification image list area on the common screen area operating image, each of the users can display the supply image in the common screen area. Therefore, since each of the users can arbitrarily change the display state of the common screen area, convenience for each of the users can be improved.

Application Example 5

[0013] The image display system of the application example 4, wherein the image display device displays the supply image identified by the identification image in the screen area in the common screen area corresponding to the divisional layout frame in which the identification image is dragged and dropped when the user drags and drops the identification image selected from the identification image list area in the divisional layout frame.

[0014] According to the image display system of this embodiment, by dragging and dropping the identification images representing the respective supply images on the common screen area operating image, the user can change the layout of the supply images in the common screen area. Therefore, since each of the users can arbitrarily change the display layout of the common screen area, convenience for each of the users can be improved.

Application Example 6

[0015] The image display system of any one of the application examples 4 and 5, the image supply device generates new divisional layout frames for the supply image identified by the identification image in an area corresponding to a position inside the divisional layout frame and shifted toward a circumferential end when the user drags and drops the identification image selected from the identification image list area into the position, and the image display device displays the supply image identified by the identification image in the screen area corresponding to the new divisional layout frame of the common screen area.

[0016] According to the image display system of this embodiment, by dragging and dropping the identification images representing the respective supply images on the common screen area operating image, the user can generate the divisional layout frames for the supply images in the common screen area. Therefore, since each of the users can arbitrarily change the display layout of the common screen area, convenience for each of the users can be improved.

Application Example 7

[0017] The image display system according to any one of the application examples 1 to 6, wherein the common screen area operating image includes a changeover switch image adapted to switch a division number in the common screen area, and the image display device divides the common screen area into the division number designated by the user with the changeover switch image.

[0018] According to the image display system of this embodiment, by operating the changeover switch image on the common screen area operating image, the user can increase or decrease the divisional layout frames in the common screen area. Therefore, since each of the users can arbitrarily change the display layout of the common screen area, convenience for each of the users can be improved.

Application Example 8

[0019] According to at least one embodiment of the disclosure, there is provided an image display method in an image display system capable of displaying supply images respectively supplied from a plurality of image supply devices on a common screen area divided into one or more screen areas via an image display device, the method including (a) displaying common screen area operating image for a user to operate a divisional state of the common screen area in each of image display sections of the image supply devices, (b) generating the supply image using an image displayed in the image display section in each of the image supply devices, and supplying the image display device with the supply image, and (c) changing the display state of the common screen area in the image display device in accordance with an operation by the user in each of the image supply devices via the common screen area operating image.

[0020] According to this embodiment, each of the users of the respective image supply devices can change the display content of the common screen area via the common screen area operating image. Therefore, since each of the users can arbitrarily change the display content of the common screen area, convenience for each of the users can be improved. Further, although the supply image generated using the display image in each of the image supply devices is displayed on the common screen area, the supply image does not include the common screen area operating image. Therefore, since each of the users can display only a desired image on the common screen area, convenience for the each user is further improved.

Application Example 9

[0021] According to at least one embodiment of the disclosure, there is provided an image display device capable of displaying supply images from a plurality of image supply devices each having an image display section and an image transmission section adapted to generate a supply image using an image displayed in the image display section and to externally transmit the supply image on a common screen area allowing a plurality of users to view a common image, the image display device changes a display state of the common screen area in response to an operation of the user via a common screen area operating image displayed in each of the image display sections of the respective image supply devices, and divides the common screen area into one or more screen areas to display a display image of the image display section.

[0022] According to this embodiment, the image displayed on the common screen area does not include the common screen area operating image. Therefore, since each of the users can display only a desired image on the common screen area, convenience for the each user is further improved.

[0023] It should be noted that the embodiments can be realized in various forms, such as an image display system (an image display device) and an image display method, a computer program for realizing the method or a function of the system thereof, or a recording medium or the like storing the computer program.

BRIEF DESCRIPTION OF THE DRAWINGS

[0024] Non-limiting and non-exhaustive embodiments of the present disclosure will be described with reference to the accompanying drawings, wherein like reference numbers reference like elements.

[0025] FIG. **1** is a schematic diagram showing a configuration of an image display system.

[0026] FIG. **2** is a block diagram showing an internal configuration of an image supply device.

[0027] FIG. **3** is a block diagram showing an internal configuration of an image display device.

[0028] FIG. **4** is an explanatory diagram for explaining communication for establishing connection between the image supply device and the image display device.

[0029] FIGS. **5**A and **5**B are explanatory diagrams for explaining an operation window.

[0030] FIG. **6** is a schematic diagram showing a standby image displayed on a projection screen.

[0031] FIGS. **7**A and **7**B are a schematic diagram showing a state of the image display device projecting a supplied image on a projection screen, and a schematic diagram showing the operation window, respectively.

[0032] FIGS. **8**A and **8**B are a schematic diagram showing a state of the image display device projecting a supplied image on a projection screen, and a schematic diagram showing the operation window, respectively.

[0033] FIGS. **9**A and **9**B are a schematic diagram showing a state of the image display device projecting a supplied image on a projection screen, and a schematic diagram showing the operation window, respectively.

[0034] FIG. **10** is an explanatory diagram for explaining communication between the image supply device and the image display device when receiving the operation of changing a display layout.

[0035] FIGS. **11**A through **11**C are explanatory diagrams for explaining switching of a display layout mode in the projection screen using a display mode switching button of the operation window.

[0036] FIGS. **12A1**, **12A2**, **12**B1 and **12**B2 are schematic diagrams for explaining a change in the display layout of the projection screen when the image display device is connected to the image display device.

[0037] FIGS. **13**A through **13**C are schematic diagrams for explaining the operation of changing the display content of the projection screen using a first button of the display mode switching buttons in the operation window.

[0038] FIGS. **14**A through **14**E are schematic diagrams for explaining the operation of changing the display content of the projection screen using the first button of the display mode switching buttons in the operation window.

[0039] FIGS. **15A1**, **15A2**, **15B1**, and **15**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the first button of the display mode switching buttons in the operation window.

[0040] FIGS. **16A1**, **16A2**, **16B1**, and **16**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using a second button of the display mode switching buttons in the operation window.

[0041] FIGS. **17A1**, **17A2**, **17B1**, and **17**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using a third button of the display mode switching buttons in the operation window.

[0042] FIGS. **18A1**, **18A2**, **18B1**, and **18**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using a slider in the operation window.

[0043] FIGS. **19A1**, **19A2**, **19B1**, and **19**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the slider in the operation window.

[0044] FIGS. **20A1**, **20A2**, **20B1**, and **20**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the slider in the operation window.

[0045] FIGS. **21A1**, **21A2**, **21B1**, and **21**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the slider in the operation window.

[0046] FIGS. **22A1**, **22A2**, **22B1**, and **22**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the slider in the operation window.

[0047] FIGS. **23A1**, **23A2**, **23B1**, and **23**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the slider in the operation window.

[0048] FIGS. **24A1**, **24A2**, **24B1**, and **24**B2 are schematic diagrams for explaining the operation of changing the display content of the projection screen using the slider in the operation window.

[0049] FIGS. **25A1**, **25A2**, **25B1**, and **25**B2 are schematic diagrams for explaining the operation of changing the display state of the projection screen by an image selection using a pointer in the operation window.

[0050] FIGS. **26A1**, **26A2**, **26B1**, and **26**B2 are schematic diagrams for explaining the operation of changing the display state of the projection screen by ID image selection using the pointer in the operation window.

[0051] FIGS. **27A1**, **27A2**, **27B1**, and **27**B2 are schematic diagrams for explaining the operation of changing the display state of the projection screen by the ID image selection using the pointer in the operation window.

[0052] FIGS. **28**A through **28**C are schematic diagrams for explaining the operation of changing the display state of the projection screen by drag and drop of the ID image using the pointer in the operation window.

[0053] FIGS. **29A1**, **29A2**, **29B1**, and **29**B2 are schematic diagrams for explaining the operation of changing the display state of the projection screen by drag and drop of the ID image using the pointer in the operation window.

[0054] FIGS. **30A1**, **30A2**, **30B1**, and **30**B2 are schematic diagrams for explaining the operation of changing the display state of the projection screen by drag and drop of the ID image using the pointer in the operation window.

[0055] FIGS. **31**A, **31**B1, **31**B2, and **31**B3 are schematic diagrams for explaining the operation of switching the display mode of the projection screen by drag and drop of the ID image using the pointer in the operation window.

[0056] FIGS. **32**A, **32**B1, **32**B2, and **31**B3 are schematic diagrams for explaining the operation of switching the display mode of the projection screen by drag and drop of the ID image using the pointer in the operation window.

DESCRIPTION OF EMBODIMENTS

A. Embodiment

[0057] FIG. **1** is a schematic diagram showing a configuration of an image display system as an embodiment of the invention. The image display system **1000** is provided with four image supply devices **100***a* through **100***d*, an image display device **200**, and a projection screen SC. The four image supply devices **100***a* through **100***d* each can be connected to the image display device **200** via a local area network (LAN). Each of the image supply devices **100***a* through **100***d* establishes connection with the image display device **200**, and then transmits a supply image, which is generated using a display image the image supply device itself keeps displaying such as a desktop image, to the image display device **200**. The image display device **200** is capable of arranging the images supplied from the respective image supply devices **100***a* through **100***d* on divisions of the projection screen SC and displaying them simultaneously.

[0058] The image display system **1000** can be used in scenes such as conferences and presentations, where a plurality of participants provides material images previously prepared by the participants and have a discussion with each other. Each of the participants logs in either one of the four image supply devices **100***a* through **100***d*, and makes the own material images be projected to and displayed on a common projection screen SC, which can be viewed by all of the participants, via the image display device **200**.

[0059] FIG. **2** is a block diagram showing an internal configuration of a first image supply device **100***a*. It should be noted that since the internal configurations of the other image supply devices, namely second through fourth image supply devices **100***b* through **100***d* are substantially the same, the illustrations and the explanations thereof will be omitted.

[0060] The first image supply device **100***a* can be configured with, for example, a personal computer or a laptop computer loaded with Windows (registered trademark) as an operating system. Specifically, the first image supply device **100***a* is provided with a central processing unit (CPU) **110**, a hard disk drive (HD) **120**, a drawing memory (VRAM) **130**, and a random access memory (RAM) **140**. Further, the first image supply device **100***a* is further provided with an operation section **150**, a display section **160**, and a wireless LAN interface (LAN/IF) **170**. These constituents **110** through **170** are connected to each other via a bus **180**.

[0061] The CPU **110**, which is a logic circuit for executing various kinds of arithmetic processing, expands various programs and modules, which are stored in an external storage device such as the HD **120**, in the RAM **140** as a primary storage device, and then executes them. The RAM **140** is a volatile memory, and temporarily stores a result of the calculation of the CPU **110**, and supply image data to be supplied to the image display device **200** and so on. The VRAM **130** is a memory for expanding and then temporarily buffering the data of the display image drawn based on the data, and is generally capable of reading and writing the data faster than the RAM **140**.

[0062] The operation section **150** is an interface for receiving an operation of the user of the first image supply device **100***a* as the participant, and is composed of, for example, a keyboard, a touch pad, and a mouse. The display section **160** is configured with, for example, a liquid crystal display, and displays images based on the contents stored in the VRAM **130**. The wireless LAN/IF **170** is an interface for connecting the first image supply device **100***a* and an external device to each other in a wireless manner. The first image supply device **100***a* exchanges a signal with the image display device **200** via the wireless LAN/IF **170**.

[0063] The HD **120** stores an image supply program P**1**. The image supply program P**1** generates the supply image data to be supplied to the image display device **200** and transmits it thereto, and at the same time, provides the participant as the user with an interface for performing an operation of changing the display state of the projection screen SC. The image supply program P**1** has an image capture module M**1**, a supply image generation module M**2**, a communication control module M**3**, and a user interface module M**4**.

[0064] The image capture module M**1** captures the display image of the display section **160**. In other words, the image capture module M**1** obtains data of an image displayed on the display section **160** from the VRAM **130**. The supply image generation module M**2** generates the supply image data to be supplied to the image display device **200** using the image data obtained by the image capture module M**1**. Specific contents of the supply image data and a generation method thereof will be described later.

[0065] The communication control module M**3** controls the wireless LAN/IF **170** to control communication with the image display device **200**. Specifically, the communication control module M**3** obtains model information of the image display device **200**, and then establishes the connection with the image display device **200**. Here, the "model information of the image display device **200**" includes identification information for identifying the image display device **200** and information (e.g., the maximum resolution with which an image can be displayed and a color profile) related to the image reproduction characteristic of the image display device **200**. Further, the communication control module M**3** transmits the supply image data generated by the supply image generation module M**2** to the image display device **200**.

[0066] The user interface module M**4** displays an operation window (described later), an image used for a user interface, on the display section **160**, and receives instructions of the user via the operation window. The communication control module M**3** transmits the instruction of the user, which has been received by the user interface module M**4**, to the image display device **200**. Further, the user interface module M**4** obtains update information (described later) of the operation window transmitted from the image display device **200**, and at the same time, updates the display content of the operation window.

[0067] FIG. **3** is a block diagram showing an internal configuration of the image display device **200**. The image display device **200** is a projector and is provided with a CPU **210**, an EEPROM **220** as a nonvolatile memory, a RAM **230**, a VRAM **240**, an operation section **250**, an image display section **260**, an optical system **270**, and a wireless LAN/IF **280**. These constituents **210** through **280** are connected to each other via a bus **290**.

[0068] The CPU **210**, which is a logic circuit for executing various kinds of arithmetic processing, expands various programs and modules, which are stored in, for example, the EEPROM **220**, in the RAM **230**, and then executes them. The RAM **230** temporarily stores a result of calculation by the CPU **210**. The VRAM **240** temporarily buffers drawing data (e.g., data of pixel values arranged by the bitmap method) generated based on the display image data. The operation section **250** is composed of an operation button, a touch panel, and so on, and receives various operations related to the image display device **200** such as control of the display state including zooming and focusing of the projection image.

[0069] The image display section **260** modulates light emitted from an RGB light source based on the drawing data stored in the VRAM **240** using liquid crystal panels or digital micro mirror devices (DMD) to thereby generate an image for projection. The optical system **270** is composed of a plurality lenses, and projects the image generated by the image display section **260** on the projection screen SC with the size and the focus thereof adjusted. The wireless LAN/IF **280** is an interface for connecting the image display device **200** and an external device to each other in a wireless manner. The image display device **200** exchanges the signals with each of the image supply device **100**_a_ through **100**_d_ via the wireless LAN/IF **280**.

[0070] The EEPROM **220** stores a control program P**20** for controlling the image display device **200**. The control program P**20** has an image obtaining module M**21**, a display layout control module M**22**, a display image generation module M**23**, a display image output module M**24**, an update information generation module M**25**, and a communication control module M**26**.

[0071] The image obtaining module M**21** obtains the supply image data supplied from each of the image supply devices **100**_a_ through **100**_d_. The display layout control module M**22** changes the settings of the display layout of the supply images on the projection screen SC along the instruction of the user transmitted from each of the image supply devices **100**_a_ through **100**_d_. The display image generation module M**23** generates image data (display image data) for projection obtained by arranging the supply image supplied from the respective image supply devices **100**_a_ through **100**_d_ along the settings of the display layout by the display layout control module M**22**. The display image output module M**24** generates the drawing data based on the display image data, and then stores it in the VRAM **240**.

[0072] The update information generation module M**25** generates the update information for updating the display content of the operation window in each of the image supply devices **100**_a_ through **100**_d_. The communication control module M**26** controls the wireless LAN/IF **280** to control communication with each of the image supply devices **100**_a_ through **100**_d_. Specifically, the communication control module M**26** executes a process for establishing a communication channel for, for example, transmission of the model information, reception of the supply image, delivery of the update information, and so on.

[0073] FIG. **4** is a sequence diagram for explaining the communication for establishing the connection between each of the image supply devices **100**_a_ through **100**_d_ and the image display device **200**. In this diagram, the processing procedure of each of the image supply devices **100**_a_ through **100**_d_ is shown on the right as one faces the sheet of the drawing in a single line without separating the image supply devices **100**_a_ through **100**_d_ into individuals. Firstly, the communication in the case in which the first image supply device **100**_a_ is connected first to the image display device **200** will be explained. It should be noted that in the drawing the transition of the display image of the projection screen SC is illustrated on the left as one faces the sheet of the drawing in a time-series manner, and the transition of the display screen of the first image supply device **100**_a_ is illustrated on the right thereof in a time series manner.

[0074] The image display device **200** keeps displaying a message, which prompts to start the image supply program P**1** to start supplying an image, on the projection screen SC in the state in which neither one of the image supply devices **100**_a_ through **100**_d_ is connected thereto. Here, for example, when a participant of a conference starts the image supply program P**1** on the first image supply device **100**_a_, the communication control module M**3** of the first image supply device **100**_a_ searches the connectable image display device **200**, and requires the model information (step [**1**]). The communication control module M**3** keeps displaying a message denoting that a connectable image display device is being searched on the display section **160** until a response from the image display device **200** is obtained successfully.

[0075] When having received the request from the first image supply device **100**_a_, the communication control module M**26** of the image display device **200** responds thereto, and at the same time, transmits (step [**2**]) the model information in response to the request from the first image supply device **100**_a_. It should be noted that in this case the image display device **200** displays a message denoting that the connection with the first image supply device **100**_a_ is under establishment on the projection screen SC.

[0076] When receiving the model information, the communication control module M**3** of the first image supply device **100**_a_ transmits the information related to the image reproduction characteristic of the image display device **200** included in the model information to the supply image generation module M**2**. The supply image generation module M**2** starts preparation for generating the supply image with a standard based on the information thus transmitted. Further, the communication control module M**3** performs setting and preparation for transmission of the supply image (step [**3**]). Further, in this case, the user interface module M**4** displays the operation window on the display section **16**.

[0077] FIGS. **5**A and **5**B are explanatory diagrams for explaining the operation window. FIG. **5**A is a schematic diagram showing an example of the display screen of the display section **160** in the first image supply device **100**_a_ on which the operation window **300** is displayed. In this example, there is displayed a desktop screen **101**_a_, and a wallpaper, a desktop icon, a taskbar, and so on are displayed on the desktop screen **101**_a_ besides the operation window **300**. It should be noted that also in the case in which a screen of an application program such as a presentation program is displayed on the first image supply device **100**_a_, the operation window **300** is displayed on the screen of the application program at the start-up of the operation window **300**.

[0078] FIG. **5**B is a schematic diagram showing only the operation window **300** in an enlarged manner. The operation window **300** includes a screen image **310** and display mode switching buttons **320**. The screen image **310** is an image obtained by shrinking the display image of the projection screen SC. The screen image **310** reflects the display content of the projection screen SC in real time due to the communication between the image display device **200** and each of the image supply devices **100**_a_ through **100**_d_ connected thereto. It should be noted that since the supply image from the outside is not displayed on the projection screen SC at this moment, the drawing shows that the projection screen SC is in the nondisplay state by providing hatching to the screen image **310**.

[0079] The display mode switching buttons **320** are components the user can operate via the operation section **150**, and are buttons for switching the mode of the display layout of the supply images in the projection screen SC. The display mode switching buttons **320** is composed of three buttons **321**, **322**, and **323** corresponding to the modes of the display layout. The details of the display mode switching buttons **320** and the modes of the display layout will be described later.

[0080] The operation window **300** is further provided with an ID image display area **330** (illustrated in the drawing with the broken line) for displaying the ID images for identifying the image supply device connected to the image display device **200** and the user as a list. The ID image is an image generated by the user interface module M**4** in each of the image supply devices **100***a* through **100***d*. The ID image includes a supply image thumbnail as a thumbnail image of the supply image, and a user identification image for identifying the user to be provided with the supply image.

[0081] The supply image thumbnail is an image generated in each of the image supply devices **100***a* through **100***d* by shrinking the supply image to the image display device **200**. It should be noted that the supply image thumbnail is periodically transmitted to the image display device **200**, and the image display device **200** derives the supply image thumbnails thus received to all of the image supply devices connected thereto as the update information of the operation window **300**. Thus, the supply image thumbnail of the operation window **300** becomes synchronized with the display content of the supply image. The user identification image is an image generated in each of the image supply devices **100***a* through **100***d* based on the user information such as a user icon and a user name the user has previously registered. It should be noted that in the drawing the supply image thumbnail **332***a* and a user identification image **333***a* representing the participant (assumed to be a "user a") logging in the first image supply device **100***a* are displayed in the ID image display area **330** as the ID image **331***a* of the first image supply device **100***a*.

[0082] After the operation window **300** is displayed, the communication control module M**3** of the first image display device **100***a* transmits the connection setting data to the image display device **200** (step [**4**] shown in FIG. **4**). Here, the "connection setting data" includes the information for establishing the communication channel, the information used by the image display device **200** for identifying the first image display device **100***a*, the ID image described above, and so on. The communication control module M**26** of the image display device **200** having obtained the connection information prepares the storage area for the first image supply device **100***a* on the RAM **230** (step [**5**]).

[0083] Subsequently, the display layout control module M**22** of the image display device **200** determines whether or not there is a space in an image display area (a layout frame) for displaying the supply image from the first image supply device **100***a* newly connected thereto (step [**6**]). Here, since the first image supply device **100***a* is connected alone to the image display device **200**, the display layout control module M**22** sets the entire surface of the projection screen SC as the layout frame for the first image supply device **100***a*.

[0084] Subsequently, the communication control module M**26** of the image display device **200** displays a standby image including a message, which denotes that acquisition of the image data for projection is in process, on the projection screen SC (step [**7**]). Then, the communication module M**26** transmits a transmission start request for the supply image to the first image supply device **100***a* (step [**8**]).

[0085] FIG. **6** is a schematic diagram showing the standby image displayed on the projection screen in the steps [**7**] and [**8**]. In the standby image **400**, the ID image of the device requiring transmission of the supply image is displayed together with the message described above. In the drawing, there is displayed the ID image **331***a* of the first image supply device **100***a*.

[0086] In the step [**9**] (FIG. **4**), the supply image generation module M**2** of the first image supply device **100***a* generates the supply image, and in the step [**10**] the communication control module M**3** starts transmission of the supply image. In the step [**11**], a projection display process of the supply image is started in the image display device **200**.

[0087] When the supply image is displayed on the projection screen SC, the update information generation module M**25** of the image display device **200** generates the image data of the screen image **310** based on the display image data generated by the display image generation module M**23**. Then, the update information generation module M**25** transmits the image data of the screen image **310** as the update information for the first image supply device **100***a* (step [**12**]).

[0088] The user interface module M**4** of the first image supply device **100***a* updates the screen image **310** (step [**13**]) of the operation window **300** (FIG. **5**B) using the update information thus received. Thus, the display image of the projection screen SC and the screen image **310** of the operation window **300** are synchronized with each other.

[0089] FIG. **7**A is a schematic diagram showing the state in which the image display device **200** keeps projecting the supply image **501***a* from the first image supply device **100***a* on the projection screen SC. On the projection screen SC, there is displayed the supply image **501***a* so as to be arranged in the entire surface thereof. The mode of the display layout for arranging one supply image in the entire projection screen SC is called a "single screen display mode" in the present specification. It should be noted that in the image display device **200** of the present embodiment, the single screen display mode is set as a default mode.

[0090] Here, although the operation window **300** is displayed on the display section **160** of the first image supply device **100***a*, the operation window **300** is not displayed in the supply image **501***a* displayed on the projection screen SC. This is because the first image supply device **100***a* generates the supply image **501***s* so that the operation window **300** is not included therein. Specifically, when capturing the display image on the display section **160**, the image capture module M**1** treats the operation window **300** as a layer window. Then, the image capture module M**1** captures the display image other than the operation window **300** while transmitting the display image through the operation window **300**. The supply image generation module M**2** generates the supply image **501***a* using the capture image.

[0091] As described above, in the image display system **1000** of the present embodiment, the operation window **300** is not displayed on the projection screen SC. Thus, it is possible to avoid that the material image the user has prepared is put behind the operation window **300** on the projection screen SC, and convenience of the image display system **1000** is improved.

[0092] FIG. **7**B is a schematic diagram showing the operation window **300** displayed on the first image supply device **100***a* in an enlarged manner. FIG. **7**B is substantially the same as FIG. **5**B except the point that the content of the screen image **310** of the operation window **300** is changed. The screen image **310** is synchronized with the display image of the projection screen SC due to the update information delivered from the image display device **200**.

[0093] FIG. **8**A is a schematic diagram for explaining the state after the second image supply device **100***b* is connected to the image display device **200** in addition to the first image supply device **100***a*. FIG. **8**A is substantially the same as FIG. **7**A except the point that the second image supply device **100***b* is added. In the present example, the desktop screen **101***b* is displayed on the second image display device **100***b* together with the operation window **300**. It should be noted that the participant operating the second image supply device **100***b* is called a "user b."

[0094] The second image supply device **100***b* is connected to the image display device **200** along the procedure explained with FIG. **4**. However, the supply image **501***a* from the first image supply device **100***a* has already been arranged in the entire surface of the projection screen SC and displayed thereon. Therefore, since there is no layout frame for displaying the supply image of the second image supply device **100***b*, the image display device **200** does not execute the steps [**7**] through [**11**] and executes the update information delivery process in the step [**12**] in the process on and after the step [**6**]. Then, the operation window **300** is updated (step [**13**]) in the first and second image supply devices **100***a*, **100***b*, respectively, using the update information thus delivered. It should be noted that the update information includes the image data for updating the screen image **310** of the operation window **300**, and the ID images of all of the image supply devices connected to the image display device **200**.

[0095] FIG. **8**B is a schematic diagram showing the updated operation window **300** displayed on the first and second image supply devices **100***a*, **100***b*. FIG. **8**B is substantially the same as FIG. **7**B except the point that the ID image **331***b* of the second image supply device **100***b* is added. When the second image supply device **100***b* establishes the connection with the image display device **200**, the ID image **331***b* of the second image supply device **100***b* is additionally displayed in the operation window **300**. Thus, the user "a" of the first image supply device **100***a* can recognize the fact that the user "b," another participant, has newly logged in the image display device **200** via the second image supply device **100***b*.

[0096] FIG. **9**A is a schematic diagram for explaining the state after each of the third and fourth image supply devices **100***c*, **100***d* is further connected to the image display device **200**. FIG. **9**A is substantially the same as FIG. **8**A except the point that the third and fourth image supply devices **100***c*, **100***d* are added. In this example, desktop screens **101***c*, **101***d* are displayed respectively in the third and fourth image supply devices **100***c*, **100***d* together with the operation window **300**. It should be noted that the participants operating the third and fourth image supply devices **100***c*, **100***d* are hereinafter called a "user c" and a "user d," respectively. It should be also noted that the projection screen SC is still set to be in the single screen display mode, the supply image **501***a* is still displayed alone on the projection screen SC.

[0097] FIG. **9**B is a schematic diagram showing the operation window **300** displayed on each of the image supply devices **100***a* through **100***d* after each of the third and fourth image supply devices **100***c*, **100***d* has established the connection with the image display device **200**. FIG. **9**B is substantially the same as FIG. **8**B except the point that the ID images **331***c*, **331***d* of the third and fourth image supply devices **100***c*, **100***d* are added. As described above, in the image display system **1000** of the present embodiment, the ID images **331***a* through **331***d* are sequentially added to and displayed in the ID image display area **330** in the order in which the image supply devices **100***a* through **100***d* are connected to the image display device **200**. It should be noted that in the image display system **1000** of the present embodiment, it is assumed that priority is provided to the image supply devices **100***a* through **100***d* in the order of the connection.

[0098] Here, as described above, in the image display system **1000** of the present embodiment, the display layout of the supply images in the projection screen SC can be changed by operating the operation window **300** in each of the image supply devices **100***a* through **100***d*. By the operation of changing the display layout via the operation window **300**, it becomes possible to display the supply images, which are supplied by the respective image supply devices **100***a* through **100***d* connected to the image display device **200**, simultaneously on the projection screen SC.

[0099] FIG. **10** is a sequence diagram for explaining the communication between each of the image supply devices **100***a* through **100***d* and the image display device **200** when the operation of changing the display layout of the projection screen SC is received via the operation window **300**. It should be noted that in FIG. **10**, the processing procedure of each of the image supply devices **100***a* through **100***d* is shown on the right as one faces the sheet of the drawing in a single line without separating the image supply devices **100***a* through **100***d* into individuals.

[0100] In response to the operation of the user via the operation window **300** (step [**20**]), the user interface module M**4** of each of the image supply devices **100***a* through **100***d* transmits (step [**21**]) the content of the operation of the user to the image display device **200**. The display layout control module M**22** of the image display device **200**, which has received the content of the operation, changes (step [**22**]) the settings of the display layout of the projection screen SC in accordance with the content of the operation. It should be noted that on this occasion it is also possible for the display layout control module M**22** to issue a transmission request of the supply image if necessary. Further, in accordance with the updated settings of the display layout, the display image generation module M**23** generates the display image data using the supply images from the respective image supply devices **100***a* through **100***d*.

[0101] After reflecting the change in the display layout on the projection screen SC, the update information generation module M**25** generates the image data of the screen image **310** based on the display image data of the projection screen SC. Then, the update information generation module M**25** delivers (step [**23**]) the image data of the screen image **310** to each of the image supply devices **100***a* through **100***d* as the update information. In each of the image supply devices **100***a* through **100***d*, the screen image **310** of the operation window **300** is updated using the update information, and the content of the screen image **310** is synchronized (step [**24**]) with the display content of the projection screen SC.

[0102] As described above, according to the image display system **1000** of the present embodiment, the display layout of the projection screen SC can be changed via any of the image supply devices **100***a* through **100***d* providing the image supply device is connected to the image display device **200**. Thus, convenience of the image display system **1000** is improved.

[0103] Hereinafter, the operation of changing the display layout via the operation window **300** will specifically be explained. It should be noted that as described above in the image display system **1000** of the present embodiment the display content of the screen image **310** of the operation window **300** and the display content of the projection screen SC are synchronized with each other. Therefore, in the explanation hereinafter, the explanation will be presented assuming that if the display content of the screen image **310** is changed, the display content of the projection screen SC is also changed in substantially the same manner.

[0104] FIGS. **11**A through **11**C are explanatory diagrams for explaining switching of the display layout mode in the projection screen SC using a display mode switching button **320** of the operation window **300**. Here, the condition in which the first image supply device **100***a* operated by the user "a" is connected alone to the image display device **200** is assumed for the sake of convenience of explanation. It should be noted that FIGS. **11**B and **11**C show a pointer **341** the user can arbitrarily move on the desktop screen via the operation section **150**.

[0105] FIG. **11**A shows the operation window **300** in the case in which the first image supply device **100***a* is connected to the image display device **200**, and the supply image **501***a* is displayed on the projection screen SC in the single screen display mode, and is substantially the same as FIG. **7**A. On this occasion, the display mode switching buttons **320** are in the state in which the first button **321** is held down. When the first button **321** is held down as described above, the projection screen SC is set in the single screen display mode.

[0106] FIG. **11**B is a schematic diagram showing the operation window **300** in the case in which the user "a" holds down the second button **322** of the display mode switching buttons **320** using the pointer **341**. When the second button **322** is held down, the projection screen SC is divided laterally into two parts, and the supply image **501***a* is displayed in the layout frame on the left side as one faces the sheet of the drawing. Hereinafter, the mode of the display layout in which the two layout frames formed by the dividing operation are provided as described above is called a "dual screen display mode."

[0107] FIG. **11**C is a schematic diagram showing the operation window **300** in the case in which the user "a" holds down the third button **323** of the display mode switching buttons **320** using the pointer **341**. When the third button **323** is held down, the projection screen SC is divided into four parts vertically and horizontally, and the supply image **501***a* is displayed in the layout frame on the upper left as one faces the sheet of the drawing. Hereinafter, the mode of the display layout in which the four layout frames obtained by dividing the projection screen SC vertically and horizontally into four parts are provided is called a "quad screen display mode." As described above, by holding down the first through third buttons **321** through **323** of the display mode switching buttons **320**, the display layout of the projection screen SC can be switched to the single screen display mode, the dual screen display mode, and the quad screen display mode, respectively.

[0108] FIGS. **12**A**1** and **12**A**2** are schematic diagrams for explaining the change in the display layout when the second image supply device **100***b* operated by the user "b" is connected to the image display device **200** in the dual screen display mode explained with reference to FIG. **11**B. It should be noted that FIG. **12**A**1** is substantially the same as FIG. **11**B.

[0109] When the second image supply device **100***b* is connected to the image display device **200** in the dual screen display mode, unlike the case explained with reference to FIGS. **8**A and **8**B, the layout frame with no image displayed exists in the projection screen SC. Therefore, the supply images **501***a*, **501***b* of the first and second image supply devices **100***a*, **100***b* are arranged laterally and displayed (FIG. **12**A**2**) on the projection screen SC along the processing procedure on and after the step [**6**] shown in FIG. **4**. Further, in the ID image display area **330** of the operation window **300**, there is additionally displayed the ID image **331***b* of the second image supply device **100***b*.

[0110] FIGS. **12**B**1** and **12**B**2** are schematic diagrams for explaining the change in the display layout caused when the second through fourth image supply devices **100***b* through **100***d* are sequentially connected to the image display device **200** in the quad screen display mode shown in FIG. **11**C. It should be noted that FIG. **12**B**1** is substantially the same as FIG. **11**C. In this case, the supply images **501***b* through **501***d* of the second through fourth image supply devices **100***b* through **100***d* are arranged in the vacant layout frames of the projection screen SC in the order indicated by the arrow shown in FIG. **12**B**2** along the processing procedure on and after the step [**6**] shown in FIG. **4**.

[0111] FIGS. **13**A through **17**B**2** are schematic diagrams for explaining the operation for changing the display content of the projection screen SC using the display mode switching buttons **320**. FIG. **13**A schematically shows the operation window **300** when the first and second image supply devices **100***a*, **100***b* are connected to the image display device **200**, and the respective supply images **501***a*, **501***b* are displayed on the projection screen SC in the dual screen display mode.

[0112] If the first button **321** of the operation window **300** is held down by the pointer **341** in this state, the projection screen SC is switched to the single screen display mode (FIG. **13**B). Further, the supply image **501***a* of the first image supply device **100***a* connected earlier to the image display device **200** and having a higher priority is displayed on the projection screen SC. Further, when the first button **321** is clicked by the pointer **341**, the supply image **501***b* of the second image supply device **100***b* is displayed on the projection screen SC while keeping the single screen display mode (FIG. **13**C). It should be noted that subsequently, it is possible to arrange that the supply images **501***a*, **501***b* are displayed alternately every time the first button **321** is clicked by the pointer **341**.

[0113] FIG. **14**A schematically shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and the respective supply images **501***a* through **501***d* are displayed on the projection screen SC in the quad screen display mode. If the first button **321** of the operation window **300** is held down by the pointer **341** in this state, the projection screen SC is switched to the single screen display mode (FIG. **14**B). Further, the supply image **501***a* of the first image supply device **100***a* connected earlier to the image display device **200** is displayed on the projection screen SC. Subsequently, every time the first button **321** is clicked by the pointer **341**, the supply images **501***b* through **501***d* are displayed on the projection screen SC in descending order of priority (FIGS. **14**C through **14**E). It should be noted that it is possible to arrange that the display state shown in FIG. **14**B is restored if the first button **321** is further clicked in the display state shown in FIG. **14**E.

[0114] FIG. **15**A**1** schematically shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, the supply image **501***b* is displayed in one of the layout frames of the dual screen display mode, and the other of the layout frames is in the nondisplay state. It should be noted that the operation method of achieving such a display state will be described later. On this occasion, when the first button **321** is held down by the pointer **341** to switch the mode thereof to the single screen display mode, the supply image **501***b* having been already displayed is rearranged to the entire surface, and is then displayed (FIG. **15**A**2**).

[0115] FIG. **15**B**1** schematically shows the operation window **300** when the projection screen SC in the single screen display mode is in the nondisplay state in the case in which all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**. It should be noted that the operation method of achieving such a display state will be described later. On this occasion, if the first button **321** is held down by the pointer **341** and the mode thereof is switched to the single screen display mode, the supply image **501***a* of the first image supply device **100***a* with the highest priority is displayed (FIG. **15**B**2**).

[0116] FIG. **16**A**1** schematically shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and all of the supply images **501***a* through **501***d* are displayed simultaneously on the projection screen SC in the quad screen display mode. On this occasion, if the second button **322** is held down by the pointer **341**, the projection screen SC is switched to be in the dual screen display mode, and the supply images **501***a*, **501***b* are arranged side-by-side in a horizontal direction and displayed simultaneously (FIG. **16**A**2**). It should be noted that it is also possible to arrange that the supply images **501***a* through **501***d* are subsequently displayed in pairs while shifting them one-by-one in descending order of priority every time the second button **322** is clicked.

[0117] FIG. **16**B**1** is substantially the same as FIG. **16**A**1** except the point that only the supply image **501***a* of the first image supply device **100***a* is in the nondisplay state. It should be noted that in the image display system **1000** of the present embodiment, when the image supply device is set to the sleep state while keeping the connection with the image display device **200**, the supply image of the image supply device is set to the nondisplay state in the projection screen SC. Further, it is also possible to arrange that the required image can arbitrarily be set to the nondisplay state in accordance with the instruction of the user.

[0118] If the second button **322** is held down by the pointer **341** in this state, the projection screen SC is switched to the dual screen display mode (FIG. **16**B**2**). Then, the supply images **501***b*, **501***c* of the second and third image supply devices **100***b*, **100***c* having higher priorities of the image supply devices **100***b* through **100***d* not set to the nondisplay state are displayed. It should be noted that it is also possible to arrange that the supply images **501***b*, **501***c*, and **501***d* are subsequently displayed while shifting them one-by-one in descending order of priority every time the second button **322** is clicked.

[0119] FIG. **17**A**1** schematically shows the operation window **300** when the supply image **501***a* is displayed on the projection screen SC in the single screen display mode in the case in which all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**. On this occasion, if the third button **323** is held down by the pointer **341**, the projection screen SC is switched to the quad screen display mode, and all of the supply images **501***a* through **501***d* are arranged and displayed simultaneously (FIG. **17**A**2**). It should be noted that the supply images **501***a* through **501***d* are arranged in the order along the priority thereof.

[0120] FIG. **17**B**1** schematically shows the operation window **300** when the first and second image supply devices **100***a*, **100***b* are connected to the image display device **200**, and the respective supply images **501***a*, **501***b* are simultaneously displayed on the projection screen SC in the dual screen display mode. On this occasion, if the third button **323** is held down by the pointer **341**, the projection screen SC is switched to the quad screen display mode. Then, the two supply images **501***a*, **501***b* are respectively arranged in the upper two layout frames disposed side-by-side in a horizontal direction, and displayed (FIG. **17**B**2**). In this case, the lower layout frames of the projection screen SC remain as vacant display areas. Therefore, the supply image from the image supply device newly connected to the image display device **200** is displayed in one of these layout frames (the process corresponding to the step [**6**] and the subsequent steps).

[0121] In the operation window **300** of the image display system **1000** according to the present embodiment, it is possible to change the display content of the projection screen SC further by the operation explained below besides the operation using the display mode switching buttons **320** described above.

[0122] FIGS. **18**A**1** through **24**B**2** are schematic diagrams for explaining the operation for changing the display content of the projection screen SC using a slider **342**. FIGS. **18**A**1** and **18**B**1** each show the operation window **300** in the case in which the first image supply device **100***a* is connected to the image display device **200**, and the supply image **501***a* is displayed on the projection screen SC in the single screen display mode. FIGS. **18**A**1** and **18**B**1** each are substantially the same as FIG. **10**A except the point that the slider **342** is shown instead of the pointer **341**.

[0123] Here, in each of the image supply devices **100***a* through **100***d* of the present embodiment, when the pointer **341** is moved to a position on a boundary (a frame line) between the layout frames in the screen image **310** in the operation window, the pointer **341** changes to the slider **342**. FIG. **18**A**1** shows the state in which the slider **342** is displayed at the right circumferential end of the screen image **310**, and FIG. **18**B**1** shows the state in which the slider **342** is displayed at the left circumferential end of the screen image **310**.

[0124] As described above, in the single screen display mode, the slider **342** is displayed at either one of the right circumferential end and the left circumferential end of the screen image **310**, and then the slider **342** is consecutively dragged toward the center of the screen image **310**. Then, the projection screen SC is switched to the dual screen display mode, and the supply image **501***a* having been displayed there is displayed in the layout frame located on the side of the direction in which the slider **342** is dragged (FIGS. **18**A**2** and **18**B**2**). Further, the display state of the display mode switching buttons **320** is changed to show the state in which the second button **322** is held down instead of the first button **321**.

[0125] As described above, in the image display system according to the present embodiment, it is possible to switch the mode of the display layout by dragging the slider **342**. It should be noted that when the mode of the display layout is switched using the slider **342**, the state of the display mode switching buttons **320** is also switched accordingly.

[0126] Here, since the first image supply device **100***a* is connected alone to the image display device **200**, the other layout frame remains in the nondisplay state. It should be noted that it is also possible to arrange that in the case in which two or more image supply devices are connected to the image display device **200**, the supply images thereof are displayed in the two layout frames in accordance with the priority of the image supply devices.

[0127] FIGS. **19**A**1** and **19**B**1** are substantially the same as FIGS. **18**A**2** and **18**B**2**, respectively. In this case, the slider **342** is previously displayed on the boundary between the layout frames located at the center of the screen image **310**, and then dragged consecutively toward the side of the layout frame where the supply image **501***a* is displayed. Then, the supply image **501***a* is deleted, and the projection screen SC becomes in the nondisplay state in the single screen display mode (FIGS. **19**A**2** and **19**B**2**).

[0128] FIGS. **20**A**1** and **20**B**1** each show the operation window **300** when the two image supply devices **100***a*, **100***b* are connected to the image display device **200**, and the respective supply images **501***a*, **501***b* are displayed on the projection screen SC in the dual screen display mode. In this display state, the slider **342** is displayed on the layout frame located at the center of the screen image **310**, and the slider **342** is dragged leftward (in the direction of the dashed arrow in FIG. **20**A**1**) or rightward (in the direction of the dashed arrow in FIG. **20**B**1**). When the slider **342** is dragged leftward, the projection screen SC is switched to the single screen display mode, and the supply image **501***b* having been displayed in the layout frame on the right side is displayed in the entire surface (FIG. **20**A**2**). On the other hand, when the slider **342** is dragged rightward, the projection screen SC is switched to the single screen display mode, and the supply image **501***a* having been displayed in the layout frame on the left side is displayed in the entire surface (FIG. **20**B**2**).

[0129] FIGS. **21**A**1** and **21**B**1** are substantially the same as FIGS. **20**A**1** and **20**B**1**, respectively, except the point that the display position of the slider **342** is different. In FIG. **21**A**1**, the slider **342** is located at an upper circumferential end of the screen image **310**, while in FIG. **21**B**1**, the slider **342** is located at a lower circumferential end of the screen image **310**. In this display state, when the slider **342** is dragged toward the vertical center of the screen image **310**, the display mode of the projection screen SC is switched from the dual screen display mode to the quad screen display mode. More specifically, when the slider **342** is dragged from the lower side to the upper side of the screen image **310** (FIG. **21**A**1**), the display mode of the projection screen SC is switched to the quad screen display mode. Then, the two supply images **501***a*, **501***b* having originally been displayed are respectively displayed in the lower two layout frames (FIG. **21**A**2**). On the other hand, when the slider **342** is dragged from the upper side to the lower side of the screen image **310** (FIG. **21**B**1**), the display mode is switched to the quad screen display mode, and the two supply images **501***a*, **501***b* are respectively displayed in the upper two layout frames (FIG. **21**B**2**). It should be noted that it is also possible to arrange that in the case in which three or more image supply devices are connected to the image display device **200**, the supply image in the nondisplay state is newly displayed in the rest of the layout frames additionally.

[0130] FIGS. **22**A**1** and **22**B**1** each show the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and the respective supply images **501***a* through **501***d* are displayed in the quad screen display mode. In this display state, in FIG. **22**A**1**, the slider **342** is dragged downward from a position on the layout frame vertically dividing the screen image **310**. Then, the display mode of the projection screen SC is switched to the dual screen display mode, and the two supply images **501***a*, **501***b* having been displayed in the upper layout frames in the quad screen display mode are continuously displayed without interruption (FIG. **22**A**2**). On the other hand, in FIG. **22**B**1**, the slider **342** is dragged upward from a position on the layout frame vertically dividing the screen image **310**. Then, the display mode of the projection screen SC is switched to the dual screen display mode, and the two supply images **501***c*, **501***d* having been displayed in the lower layout frames in the quad screen display mode are continuously displayed without interruption (FIG. **22**B**2**).

[0131] FIGS. **23**A**1** and **23**B**1** each show the state in which the first image supply device **100***a* or the fourth image supply device **100***d* is logged out in the state explained with reference to FIGS. **22**A**1** and **22**B**1**, respectively. Specifically, in FIG. **23**A**1**, the ID image **331***a* of the first image supply device **100***a* is deleted, while in FIG. **23**B**1**, the ID image **331***d* of the fourth image supply device **100***d* is deleted. In this state, when executing the operation of the slider **342** substantially the same as explained with reference to FIGS. **22**A**1** and **22**B**1**, the display state of the projection screen SC is switched to the dual screen display mode, and the layout frame on the side toward which the slider **342** is dragged is eliminated. Then, there appears the state (FIGS. **23**A**2** and **23**B**2**) in which either one of the supply images **501***b*, **501***c* is displayed in one of the layout frames of the projection screen SC, and no image is displayed in the other of the layout frames.

[0132] FIG. **24**A**1** shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and the respective supply images **501***a* through **501***d* are displayed in the quad screen display mode. On this occasion, the slider **342** is displayed at an upper circumferential end of the screen image **310**, and is dragged up to the lower circumferential end thereof. Then, the display mode of the projection screen SC is switched to the single screen display mode, and all of the supply images **501***a* through **501***d* are set to the nondisplay state (FIG. **24**A**2**). It should be noted that the same can be applied to the case in which the slider **342** is dragged from a right or left circumferential end of the screen image **310** to the opposite circumferential end thereof in the quad screen display mode (FIGS. **24**B**1** and **24**B**2**).

[0133] FIGS. **25**A**1**, **25**A**2**, **25**B**1** and **25**B**2** are schematic diagrams for explaining the operation of changing the display state of the projection screen SC by the image selection using the pointer **341**. FIG. **25**A**1** shows the operation window **300** when the supply images **501***a*, **501***b* are displayed in the dual screen display mode in the condition in which all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**. It should be noted that in FIG. **25**A**1**, the supply image **501***a* is surrounded by a broken line, thus schematically indicating that the supply image **501***a* is selected by the pointer **341**.

[0134] Here, the supply image **501***a* is designated on the screen image **310** of the operation window **300** by the pointer **341** and then double-click is performed. Then, the display mode of the projection screen SC is switched to the single screen display mode, and the supply image **501***a* is displayed in an enlarged manner (FIG. **25**A**2**). The same can be applied to the case in which the supply image **501***a* is designated and then double-click is executed in the quad screen display mode (FIGS. **25**B**1** and **25**B**2**). As described above, in the image display system **1000** according to the present embodiment, it is possible to arbitrarily select one of a plurality of supply images arranged in the divisions on the projection screen SC, and to display it in the entire surface in an enlarged manner.

[0135] FIGS. **26**A**1**, **26**A**2**, **26**B**1**, **26**B**2**, **27**A**1**, **27**A**2**, **27**B**1**, and **27**B**2** are schematic diagrams for explaining the operation of changing the display state of the projection screen SC by ID image selection using the pointer **341**. FIG. **26**A**1** is substantially the same as FIG. **25**A**1** except the point that the image selected by the pointer **341** is different. In FIG. **26**A**1**, the supply image thumbnail **332***a* is selected out of the ID images **331***a* through **331***d* displayed in the ID image display area **330**. When double-clicking the supply image thumbnail **332***a* using the pointer **341**, the display mode of the projection screen SC is switched to the single screen display mode, and the supply image **501***a* from the first image supply device **100***a* is displayed in an enlarged manner (FIG. **26**A**2**). The same can be applied to the case of double-clicking the supply image thumbnail **332***a* in the quad screen display mode (FIGS. **26**B**1** and **26**B**2**).

[0136] FIG. **27**A**1** is substantially the same as FIG. **26**A**1** except the point that the supply image **501***a* is displayed in the single screen display mode, and the point that the supply image thumbnail **332***b* is selected by the pointer **341**. When the supply image **501***a* is displayed alone on the projection screen SC in the single screen display mode, double click on the supply image thumbnail **332***b* is performed using the pointer **341**. Then, the supply image **501***b* from the second image supply device **100***b* is displayed on the projection screen SC instead of the supply image **501***a* (FIG. **27**A**2**). It should be noted that the same can be applied to the case in which double-click on the supply image thumbnail **332***b* is performed using the pointer **341** when the projection screen SC is in the nondisplay state (FIGS. **27**B**1** and **27**B**2**).

[0137] It should be noted that it is also possible to arrange that the display state of the projection screen SC can be changed by double-clicking the user identification image instead of the supply image thumbnail. As described above, in the image display system **1000** according to the present embodiment, it is possible to arbitrarily select the image supply device from the ID images displayed on the operation window **300**, and to display the supply image from the selected image supply device in the entire surface on the projection screen SC.

[0138] FIGS. **28**A through **30**B**2** are schematic diagrams for explaining the operation of changing the display state of the projection screen SC by drag-and-drop of the ID image using the pointer **341**. FIG. **28**A is substantially the same as FIG. **27**A**1**. In the display state shown in FIG. **28**A, the supply image thumbnail **332***b* is dragged and dropped onto the screen image **310** using the pointer **341** (FIG. **28**B). Then, the supply image **501***b* is displayed on the projection screen SC instead of the supply image **501***a* (FIG. **28**C). It should be noted that in the image display system **1000** according to the present embodiment, switching of the display layout mode is performed depending on the location where the supply image thumbnail **332***b* is dropped. The details thereof will be described later.

[0139] FIG. **29**A**1** shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and no image is displayed in either of the two layout frames in the dual screen display mode. On this occasion, the supply image thumbnail **332***b* is dragged and then dropped in the layout frame on the left side in the screen image **310**. Then, the supply image **501***b* is displayed in the layout frame on the left side of the projection screen SC (FIG. **29**A**2**). On the other hand, in the case in which the supply image thumbnail **332***b* is dragged and dropped in the layout frame on the right side using the pointer **341** (FIG. **29**B**1**), the supply image **501***b* is displayed in the layout frame on the right side of the projection screen SC (FIG. **29**B**2**). It should be noted that it is also possible to arrange that in the case in which the supply image from another image supply device has already been displayed in the layout frame to which the supply image thumbnail is dropped, the previous supply image is replaced.

[0140] FIG. **30**A**1** shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and only the layout frame at the lower right stage is in the nondisplay state in the quad screen display mode. It should be noted that the three supply images **501***a* through **501***c* are displayed on the projection screen SC. In this case, the supply image thumbnail **332***d* corresponding to the supply image **501***d* remaining in the nondisplay state is dragged and dropped in the layout frame remaining in the nondisplay state using the pointer **341**. Then, the supply image **501***d* from the fourth image supply device **100***d* is displayed in this layout frame (FIG. **30**A**2**).

[0141] FIG. **30**B**1** shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and all of the supply images **501***a* through **501***d* are displayed on the projection screen SC in the quad screen display mode. On this occasion, for example, the supply image thumbnail **332***d* is dragged and dropped in the layout frame, in which the supply image **501***c* from the third image supply device **100***c* is displayed, using the pointer **341**. Then, the display position of the supply image **501***c* and the display position of the supply image **501***d* are replaced with each other (FIG. **30**B**2**).

[0142] As described above, in the image display system **1000** according to the present embodiment, in the operation window **300**, the supply image from the image supply device represented by the ID image can be displayed in the layout frame by dragging and dropping the ID image in the layout frame on the screen image **310**. Here, in the image display system **1000** according to the present embodiment, the mode of the display layout can be switched further by drag-and-drop of the ID image using the pointer **341**. A specific method thereof will hereinafter be explained.

[0143] FIGS. **31**A through **32**B**3** are schematic diagrams for explaining a switching operation of the display mode of the projection screen SC by drag-and-drop of the ID image using the pointer **341**. FIG. **31**A shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and the supply image **501***a* is displayed on the projection screen SC in the single screen display mode. It should be noted that in FIG. **31**A, the screen image **310** is divided into three image areas LA, CA, RA in the lateral direction by providing the hatching to the screen image **310** for the sake of convenience of explanation.

[0144] When the display state shown in FIG. **31**A appears, the supply image thumbnail **332***b* corresponding to the supply image **501***b* of the second image supply device **100***b* is dragged and dropped on the screen image **310** using the pointer **341** as explained above with reference to FIGS. **28**A, **28**B, and **28**C. In this case, when dropping the supply image thumbnail **332***b* in the image area CA located at a relatively center of the screen image **310**, the supply image to be displayed on the projection screen SC is replaced while keeping the single screen display mode similarly to the case explained with reference to FIGS. **28**A, **28**B, and **28**C (FIG. **31**B**1**).

[0145] On the other hand, when dropping the supply image thumbnail **332***b* in the image area LA shifted toward a relatively left circumferential end of the screen image **310**, the display mode of the projection screen SC is switched to the dual screen display mode. Further, the supply image **501***b* from the second image supply device **100***b* is displayed in the layout frame on the left side, and the supply image **501***a* from the first image supply device **100***a* having originally been displayed there is displayed in the layout frame on the right side (FIG. **31**B**2**). When dropping the supply image thumbnail **332***b* in the image area RA shifted toward a relatively right circumferential end of the screen image **310**, the display mode of the projection screen SC is also switched to the dual screen display mode. Further, the supply image **501***b* from the second image supply device **100***b* is displayed in the layout frame on the right side, and the supply image **501***a* from the first image supply device **100***a* having originally been displayed there is displayed in the layout frame on the left side (FIG. **31**B**3**).

[0146] FIG. **32**A shows the operation window **300** when all of the image supply devices **100***a* through **100***d* are connected to the image display device **200**, and the supply images **501***a* and **501***b* are displayed on the projection screen SC in the dual screen display mode. It should be noted that in FIG. **32**A, the screen image **310** is divided into three image areas UA, CA, BA in the vertical direction by providing the hatching to the screen image **310**.

[0147] In the display state shown in FIG. **32**A, the supply image thumbnail **332***c* is dragged and dropped onto the screen image **310** using the pointer **341**. On this occasion, when dropping the supply image thumbnail **332***c* in, for example, the image area CA at a relatively center of the screen image **310**, the supply image **501***c* corresponding to the supply image thumbnail **332***c* is displayed (FIG. **32**B**1**) in the layout frame in which the supply image thumbnail **332***c* is dropped while keeping the dual screen display mode.

[0148] On the other hand, when dropping the supply image thumbnail **332***c* in the image area UA shifted toward a relatively upper circumferential end of the screen image **310**, the display mode of the projection screen SC is switched to the quad screen display mode. Here, in the case in which the supply image thumbnail **332***c* has been dropped in the layout frame on the left side, the supply image **501***c* is displayed in the layout frame on the upper left stage. In the case in which the supply image thumbnail **332***c* has been dropped in the layout frame on the right side, the supply image **501***c* is displayed in the layout frame on the upper right stage. The supply images **501***a*, **501***b* from the first and second image supply devices **100***a*, **100***b* having originally been displayed are displayed in the two layout frames on the lower stage, respectively (FIG. **32**B**2**).

[0149] Further, when dropping the supply image thumbnail **332***c* in the image area DA shifted toward a relatively lower circumferential end of the screen image **310**, the display mode of the projection screen SC is also switched to the quad screen display mode. Then, in the case in which the supply image thumbnail **332***c* has been dropped in the layout frame on the left side, the supply image **501***c* is displayed in the layout frame on the lower left stage. In the case in which the supply image thumbnail **332***c* has been dropped in the layout frame on the right side, the supply image **501***c* is displayed in the layout frame on the lower right stage. The supply images **501***a*, **501***b* from the first and second image supply devices **100***a*, **100***b* having originally been displayed are displayed in the two layout frames on the upper stage, respectively (FIG. **32**B**3**).

[0150] As described above, according to the image display system **1000** of the present embodiment, it is possible to arrange the supply images **501***a* through **501***d* from the four image supply devices **100***a* through **100***d* in the divisions of the common projection screen SC and to display them simultaneously. Further, each user can arbitrarily operate the display state on the projection screen SC via the operation window **300**, which is displayed in the display section **160** of each of the image supply devices **100***a* through **100***d* but is not shown on the projection screen SC. As described above, there is provided novel convenience such that each of the participants can effectively make a presentation in conferences, presentations and the like.

B. Modified Examples

[0151] It should be noted that the invention is not limited to the specific examples and the embodiment described above, but can be put into practice in various forms within the scope or the spirit of the invention, and the following modifications, for example, are also possible.

B1. First Modified Example

[0152] In the embodiment described above, it is possible to replace a part of the configuration realized by hardware with software, or to replace a part of the configuration realized by software with hardware. For example, it is also possible to make a part of the function of the image supply program P**1** as hardware.

B2. Second Modified Example

[0153] In the embodiment described above, the four image supply devices **100***a* through **100***d* are connected to the image display device **200**. However, it is also possible to arrange that a plurality of image supply devices is additionally connected to the image display device **200**.

B3. Third Modified Example

[0154] In the embodiment described above, the image display device **200** has display modes of a divisional arrangement such as a dual screen display mode of dividing the projection screen SC vertically into two parts or a quad screen display mode of dividing it vertically into two parts and further dividing each of the divisions horizontally into two parts. However, it is also possible to arrange that the image display device **200** has many additional display modes of a divisional arrangement. For example, it is also possible to arrange that the image display device **200** has a display mode of dividing the projection screen into three parts either vertically or horizontally or a display mode of dividing it into many more layout frames.

B4. Fourth Modified Example

[0155] In the embodiment described above, in the display modes of a divisional arrangement provided to the image display device **200**, each of the layout frames is configured to have the same size. However, if is also possible to arrange that each of the layout frames of the projection screen SC is configured to have a different size. It is also possible to arrange that each of the users can arbitrarily change the sizes of the layout frames via the operation window **300**.

B5. Fifth Modified Example

[0156] In the embodiment described above, the image display device **200** functions as a sever in the image display system **1000** for, for example, delivering the update information for synchronizing the display content of the operation window **300** to each of the image supply devices **100***a* through **100***d* connected thereto. However, the update information of the operation window **300** need not be delivered by the image display device **200**. For example, it is possible to arrange that the image supply device first connected to the image display device **200** delivers the update information for synchronizing the operation window **300** of each of the image display device **200**.

B6. Sixth Modified Example

[0157] In the embodiment described above, the image supply devices **100***a* through **100***d* are provided with priority descending as the order of connection to the image display device **200**. However, it is also possible to arrange that the priority of the image supply devices **100***a* through **100***d* is provided along another order. For example, it is possible to arrange that the priority of the image supply devices **100***a* through **100***d* is set previously, or can arbitrarily be set or modified by the user. Further, it is not necessarily required to provide such priority to the image supply devices **100***a* through **100***d*. It should be noted that it is preferable to provide priority to the image supply devices **100***a* through **100***d* in order for performing control of the layout of each of supply images on the projection screen.

B7. Seventh Modified Example

[0158] In the embodiment described above, the image supply devices **100***a* through **100***d* supply the image display device **200** with the own display image except the operation window **300** as the respective supply images **501***a* through **501***d*. However, it is also possible to arrange that each of the image supply devices **100***a* through **100***d* supplies the image display device **200** with only an arbitrary area of the display image such as a window of an application program. It is sufficient for each of the supply images **501***a* though **501***d* to be generated using the display image.

B8. Eighth Modified Example

[0159] Although in the embodiment described above, the operation window **300** is provided with the ID image display area **330**, it is also possible to arrange that the ID image display area **330** is omitted. However, the ID image display area **330** functions as an area for displaying the supply images as a list, and therefore, is preferably provided in order for improving convenience of the user as a participant. Further, in the embodiment described above, although the operation window **300** is provided with the display mode switching buttons **320**, the display mode switching buttons **320** can be omitted. Further, it is also possible to arrange that there is displayed an icon for switching the display mode having a display form different from that of the display mode switching buttons **320**.

B9. Ninth Modified Example

[0160] In the embodiment described above, the display content of the screen image **310** is synchronized with the display content of the projection screen SC. However, it is not necessarily required for the screen image **310** to reflect all of the display content of the projection screen SC, and it is also possible to arrange that the screen image **310** reflects only the display layout of the supply images in the projection screen SC. In other words, it is also possible to arrange that the layout frames of the projection screen SC is displayed alone in the screen image **310**.

B10. Tenth Modified Example

[0161] In the embodiment described above, in the case in which the image supply device is newly connected, if there is not vacant layout frame, the supply image of the image supply device remains in the nondisplay state (step [**6**] in FIG. **4**). However, it is also possible to arrange that in the case in which the image supply device is newly connected, if there is no vacant layout frame, the display mode is automatically switched to generate the layout frame, and the supply image is displayed immediately.

B11. Eleventh Modified Example

[0162] In the embodiment described above, it is also possible to arrange that the display position of each of the supply images **501***a* through **501***d* can be changed by dragging the supply images **501***a* through **501***d* displayed in the screen image **310** of the operation window **300** onto another layout frame using the pointer **341**.

B12. Twelfth Modified Example

[0163] In the embodiment described above, the image display device **200** is configured as a projector for projecting an image on the projection screen SC. However, the image display device **200** is not necessarily required to be a projector, but it is possible to arrange that the image display device **200** is an image display device for generating an image on, for example, a liquid crystal display and an organic EL display.

B13. Thirteenth Modified Example

[0164] Although in the embodiment described above, the image supply devices **100***a* through **100***d* are configured with personal computers, it is not necessarily required to configure the image supply devices **100***a* through **100***d* with personal computers. Further, even in the case in which the image supply devices **100***a* through **100***d* are configured with personal computers, the operating system to be loaded is not necessarily required to be Windows (registered trademark). It should be noted that the image supply devices **100***a* through **100***d* are preferably provided with a function capable of capturing an image excluding the operation window **300** from the display image.

B14. Fourteenth Modified Example

[0165] Although in the embodiment described above, the image supply devices **100***a* through **100***d* and the image display device **200** are wirelessly connected to each other, it is also possible to arrange that the image supply devices **100***a* through **100***d* and the image display device **200** are connected to each other with wire.

What is claimed is:

1. An image display system having a common screen area allowing a plurality of users to view a common image, comprising:

a plurality of image supply devices each having an image display section, and an image transmission section adapted to generate a supply image using an image displayed in the image display section and to externally transmit the supply image; and

an image display device capable of dividing the common screen area into one or more screen areas, and of displaying the supply image supplied from each of the plurality of image supply devices in the one or more screen areas,

wherein each of the image supply devices displays a common screen area operating image to operate a display state of the common screen area in the image display section, and supplies a display image of the image display section to the image display device as the supply image, and

the image display device changes the display state of the common screen area in accordance with an operation in each of the image supply devices via the common screen area operating image.

2. The image display system according to claim **1**, wherein

the common screen area operating image includes a layout image having divisional layout frames showing a configuration of one or more screen areas in the common screen area,

the divisional layout frames can be changed by an operation on the common screen area operating image, and

the image display device performs display after changing a configuration of the one or more screen areas in the common screen area in accordance with the change of the divisional layout frames.

3. The image display system according to claim **2**, wherein

the image display device generates new divisional layout frames in response to an operation of dragging a boundary between the divisional layout frames into an area in the layout frame on the common screen area operating image, and

the image display device deletes the divisional layout frames in response to an operation of dragging the boundary existing between the divisional layout frames out of the layout image on the common screen area operating image.

4. The image display system according to claim **2**, wherein

the common screen area operating image has an identification image list area adapted to display a list of identification images for identifying the supply images supplied from the image supply devices, and

the image display device displays the supply image identified by the identification image selected in the identification image list area on the common screen area operating image.

5. The image display system according to claim **4**, wherein

the image display device displays the supply image identified by the identification image in the screen area in the common screen area corresponding to the divisional layout frame in which the identification image is dragged and dropped when the user drags and drops the identification image selected from the identification image list area in the divisional layout frame.

6. The image display system according to claim **4**, wherein

the image supply device generates new divisional layout frames for the supply image identified by the identification image in an area corresponding to a position inside the divisional layout frame and shifted toward a circumferential end when the identification image selected from the identification image list area is dragged and dropped into the position, and

the image display device displays the supply image identified by the identification image in the screen area corresponding to the new divisional layout frame of the common screen area.

7. The image display system according to claim **1**, wherein

the common screen area operating image includes a changeover switch image adapted to switch a division number in the common screen area, and

the image display device divides the common screen area into the division number designated with the changeover switch image.

8. The image display system according to claim **1**, wherein

the image supply device supplies the display image of the image display section except the common screen operating image.

9. The image display system according to claim **1**, wherein

the image supply device supplies a part of the display image of the image display section.

10. An image display method in an image display system capable of displaying supply images respectively supplied from a plurality of image supply devices on a common screen area divided into one or more screen areas via an image display device, the method comprising:

(a) displaying common screen area operating image to operate a display state of the common screen area in each of image display sections of the image supply devices;

(b) generating the supply image using an image displayed in the image display section in each of the image supply devices, and supplying the image display device with the supply image; and

(c) changing the display state of the common screen area in the image display device in accordance with an operation in each of the image supply devices via the common screen area operating image.

11. An image display device capable of displaying supply images from a plurality of image supply devices each having an image display section and an image transmission section adapted to generate a supply image using an image displayed in the image display section and to externally transmit the supply image on a common screen area allowing a plurality of users to view a common image, the image display device:

changes a display state of the common screen area in response to an operation via a common screen area operating image displayed in each of the image display sections of the respective image supply devices; and

divides the common screen area into one or more screen areas to display a display image of the image display section.

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