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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99) | Application Number | 15787067 |
| | Filing Date | 2017-10-18 |
| | First Named Inventor | William Ho Chang |
| | Art Unit | |
| | Examiner Name | |
| | Attorney Docket Number | FXT312CON2 |

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| 11 | UNITED STATES PATENT AND TRADEMARK OFFICE, Office Action for U.S. Patent Application Serial No. 11/933,031, February 10, 2016, 106 pages. |
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Receipt date: 10/25/2017

15/787,067 - GAU: 2458

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

| | |
|------------------------|------------------|
| Application Number | 15787067 |
| Filing Date | 2017-10-18 |
| First Named Inventor | William Ho Chang |
| Art Unit | |
| Examiner Name | |
| Attorney Docket Number | FXT312CON2 |

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| Filing Date | 2017-10-18 |
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| Art Unit | |
| Examiner Name | |
| Attorney Docket Number | FXT312CON2 |

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|------------|-------------------|---------------------|------------|
| Signature | /Peter D. Sabido/ | Date (YYYY-MM-DD) | 2017-10-25 |
| Name/Print | Peter D. Sabido | Registration Number | 50353 |

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EAST Search History

EAST Search History (Prior Art)

| Ref # | Hits | Search Query | DBs | Default Operator | Plurals | Time Stamp |
|-------|------|--|---|------------------|---------|------------------|
| S103 | 178 | (H04L12/2812 H04N7/24 H04L41/509).cpc. and ((reference or pointer) near3 (media or content or (digital near content) or video)) and (touch near3 (screen or pad or device or unit or phone or display or mobile)) | US-PGPUB; USPAT | WITH | ON | 2018/09/19 08:29 |
| S104 | 146 | (H04L12/2812 H04N7/24 H04L41/509).cpc. and ((media or content or (digital near content) or video)) and (touch near3 (screen or pad or device or unit or phone or display or mobile)) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) | US-PGPUB; USPAT | WITH | ON | 2018/09/19 08:33 |
| S105 | 1666 | ((camera or display or printer or radio or audio) near3 (image or video or audio) (mobile or (cell adj phone) or phone or PDA) same bluetooth) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 09:36 |
| S106 | 988 | ((camera or display or printer or radio or audio) near3 (image or video or audio) (mobile or (cell adj phone) or phone or PDA) same bluetooth) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near2 screen) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 09:39 |
| S107 | 489 | ((camera or display or printer or radio or audio) near3 (image or video or audio) (mobile or (cell adj phone) or phone or PDA) same bluetooth) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near2 screen) and (display\$4 near2 (content or media or list)) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 09:41 |
| S108 | 5146 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio)) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near2 screen) and (display\$4 near2 (content or media or list)) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 09:47 |
| S109 | 4527 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio)) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near2 screen) and (display\$4 near2 (content or media or list)) and (wireless near2 (connection or communication)) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 09:48 |
| S111 | 674 | ((play\$4 or stream\$4 or listen\$4 or | US-PGPUB; | WITH | ON | 2018/09/19 |

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| | | view\$4 or display\$4) near2 (video or audio) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) | USPAT; EPO; JPO; DERWENT; IBM_TDB | | | 09:55 |
| S110 | 680 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near2 screen) and (display\$4 near2 (content or media or list)) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 09:55 |
| S113 | 0 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) and @pd< "2000" | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 10:12 |
| S112 | 0 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) and @ad< "2000" | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 10:12 |
| S114 | 0 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) and @pd< "112000" | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 10:13 |
| S115 | 650 | ((play\$4 or stream\$4 or listen\$4 or view\$4 or display\$4) near2 (video or audio) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) and (internet) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 10:14 |
| S116 | 667 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) and (internet) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 10:16 |
| S117 | 402 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list)) (select\$4 | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 10:54 |

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| | | or choos\$3 or pick\$4)) and (internet) | | | | |
| S118 | 343 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list) (select\$4 or choos\$3 or pick\$4)) and (internet) and (bluetooth) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 11:13 |
| S119 | 77 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((server or service) (authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) and (display\$4 near2 (content or media or list) (select\$4 or choos\$3 or pick\$4)) and (internet) and (bluetooth) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 11:27 |
| S120 | 0 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((server or service) (authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) (display\$4 near2 (content or media or list) (select\$4 or choos\$3 or pick\$4)) and (internet) and (bluetooth) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 11:28 |
| S121 | 0 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((server or service) (authenticat\$4 or authoriz\$5) near2 (data or information)) and (touch near screen) (display\$4 near2 (content or media or list) (select\$4 or choos\$3 or pick\$4)) and (internet) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 11:47 |
| S122 | 16 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content) wireless\$3) same(mobile or (cell adj phone) or phone or PDA) and ((server or service) (authenticat\$4 or authoriz\$5)) and (touch near screen) (display\$4 near2 (content or media or list) (select\$4 or choos\$3 or pick\$4)) and (internet) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 11:50 |
| S123 | 50 | ((play\$4 or stream\$4 or listen\$4) near2 (video or audio or content)) same (mobile or (cell adj phone) or phone or PDA or tablet or camera) and ((authenticat\$4 or authoriz\$5)) and (touch near (screen or display)) ((content or media or video or audio) near2 (library or guide or database or list) (select\$4 or choos\$3 or pick\$4)) and (internet) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 12:54 |
| S124 | 10 | ((camera or display or printer or radio or audio) near3 (image or video or audio) (mobile or (cell adj phone) or phone or PDA) same bluetooth) and (payment near3 subscrib\$6) | US-PGPUB; USPAT; EPO; JPO; DERWENT; IBM_TDB | WITH | ON | 2018/09/19 13:00 |

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Receipt date: 10/25/2017

15/787,067 - GAU: 2458

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Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)

Approved for use through 07/31/2016. OMB 0851-0031

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99) | Application Number | 15787067 |
| | Filing Date | 2017-10-18 |
| | First Named Inventor | William Ho Chang |
| | Art Unit | |
| | Examiner Name | |
| | Attorney Docket Number | FXT312CON2 |

| U.S.PATENTS | | | | | | | Remove |
|-------------------|---------|---------------|------------------------|------------|---|--|--------|
| Examiner Initial* | Cite No | Patent Number | Kind Code ¹ | Issue Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear | |
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| Application Number | 15787067 |
| Filing Date | 2017-10-18 |
| First Named Inventor | William Ho Chang |
| Art Unit | |
| Examiner Name | |
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¹ See Kind Codes of USPTO Patent Documents at www.USPTO.GOV or MPEP 901.04. ² Enter office that issued the document, by the two-letter code (WIPO Standard ST.3). ³ For Japanese patent documents, the indication of the year of the reign of the Emperor must precede the serial number of the patent document. ⁴ Kind of document by the appropriate symbols as indicated on the document under WIPO Standard ST.16 if possible. ⁵ Applicant is to place a check mark here if English language translation is attached.

EFS Web 2.1.17

ALL REFERENCES CONSIDERED EXCEPT WHERE LINED THROUGH. /E.B.H./

Roku, Inc. v. Flexiworld Technologies, Inc.
Flexiworld Technologies, Inc. Ex. 2008 - 267
Patent Prosecution History for U.S. Patent No. 10,489,096
PGR2021-00112

**INFORMATION DISCLOSURE
STATEMENT BY APPLICANT**
(Not for submission under 37 CFR 1.99)

| | |
|------------------------|------------------|
| Application Number | 15787067 |
| Filing Date | 2017-10-18 |
| First Named Inventor | William Ho Chang |
| Art Unit | 2838 |
| Examiner Name | |
| Attorney Docket Number | FXT312CON2 |

CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

OR

☐ That no item of information contained in the information disclosure statement was cited in a communication from a foreign patent office in a counterpart foreign application, and, to the knowledge of the person signing the certification after making reasonable inquiry, no item of information contained in the information disclosure statement was known to any individual designated in 37 CFR 1.56(c) more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(2).

See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

SIGNATURE

A signature of the applicant or representative is required in accordance with CFR 1.33, 10.18. Please see CFR 1.4(d) for the form of the signature.

| | | | |
|------------|-------------------|---------------------|------------|
| Signature | /Peter D. Sabido/ | Date (YYYY-MM-DD) | 2018-02-26 |
| Name/Print | Peter D. Sabido | Registration Number | 50353 |

This collection of information is required by 37 CFR 1.97 and 1.98. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 1 hour to complete, including gathering, preparing and submitting the completed application form to the USPTO. Time will vary depending upon the individual case. Any comments on the amount of time you require to complete this form and/or suggestions for reducing this burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P.O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. **SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.**

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3. A record in this system of records may be disclosed, as a routine use, to a Member of Congress submitting a request involving an individual, to whom the record pertains, when the individual has requested assistance from the Member with respect to the subject matter of the record.
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5. A record related to an International Application filed under the Patent Cooperation Treaty in this system of records may be disclosed, as a routine use, to the International Bureau of the World Intellectual Property Organization, pursuant to the Patent Cooperation Treaty.
6. A record in this system of records may be disclosed, as a routine use, to another federal agency for purposes of National Security review (35 U.S.C. 181) and for review pursuant to the Atomic Energy Act (42 U.S.C. 218(c)).
7. A record from this system of records may be disclosed, as a routine use, to the Administrator, General Services, or his/her designee, during an inspection of records conducted by GSA as part of that agency's responsibility to recommend improvements in records management practices and programs, under authority of 44 U.S.C. 2904 and 2906. Such disclosure shall be made in accordance with the GSA regulations governing inspection of records for this purpose, and any other relevant (i.e., GSA or Commerce) directive. Such disclosure shall not be used to make determinations about individuals.
8. A record from this system of records may be disclosed, as a routine use, to the public after either publication of the application pursuant to 35 U.S.C. 122(b) or issuance of a patent pursuant to 35 U.S.C. 151. Further, a record may be disclosed, subject to the limitations of 37 CFR 1.14, as a routine use, to the public if the record was filed in an application which became abandoned or in which the proceedings were terminated and which application is referenced by either a published application, an application open to public inspections or an issued patent.
9. A record from this system of records may be disclosed, as a routine use, to a Federal, State, or local law enforcement agency, if the USPTO becomes aware of a violation or potential violation of law or regulation.

Bibliographic Data

Application No: 15/787,067

Foreign Priority claimed: ☐ Yes ☒ No

35 USC 119 (a-d) conditions met: ☐ Yes ☒ No ☐ Met After Allowance

Verified and Acknowledged:

/ESTHER B. HENDERSON/

Examiner's Signature

E.B.H

Initials

Title:

MOBILE INFORMATION APPARATUS WITH AN APPLICATION FOR RECEIVING DIGITAL CONTENT FROM A DIGITAL CONTENT SERVICE OVER THE INTERNET AND FOR WIRELESSLY TRANSMITTING OR PLAYING AT LEAST PART OF THE RECEIVED DIGITAL CONTENT AT A BLUETOOTH ENABLE OUTPUT DEVICE

| FILING or 371(c) DATE | CLASS | GROUP ART UNIT | ATTORNEY DOCKET NO. |
|-----------------------|-------|----------------|---------------------|
| 10/18/2017 | 705 | 2458 | FXT312CON2 |
| RULE | | | |

APPLICANTS

Flexiworld Technologies, Inc., Vancouver, WA,

INVENTORS

William Ho Chang Vancouver, WA, UNITED STATES

Christina Ying Liu San Francisco, CA, UNITED STATES

CONTINUING DATA

This application is a CIP of 13710299 12/10/2012 PAT 9798516

13710299 is a CON of 12903048 10/12/2010 PAT 8332521

This application is a CIP of 10053765 01/18/2002 PAT 9836257

This application is a CON of 09992413 11/18/2001 PAT 9965233

12903048 is a CON of 10016223 11/01/2001 PAT 7941541

10053765 has PRO of 60262764 01/19/2001

09992413 has PRO of 60252682 11/20/2000

10016223 has PRO of 60245101 11/01/2000

FOREIGN APPLICATIONS

IF REQUIRED, FOREIGN LICENSE GRANTED**

11/01/2017

STATE OR COUNTRY

UNITED STATES

ADDRESS

KOLISCH HARTWELL, P.C.

200 PACIFIC BUILDING
520 SW YAMHILL STREET
PORTLAND, OR 97204
UNITED STATES
FILING FEE RECEIVED
\$1,600

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)

Approved for use through 07/31/2016. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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|---|------------------------|------------------|
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99) | Application Number | 15787067 |
| | Filing Date | 2017-10-18 |
| | First Named Inventor | William Ho Chang |
| | Art Unit | 2838 |
| | Examiner Name | |
| | Attorney Docket Number | FXT312CON2 |

| U.S.PATENTS | | | | | | Remove |
|-------------------|---------|---------------|------------------------|------------|---|--|
| Examiner Initial* | Cite No | Patent Number | Kind Code ¹ | Issue Date | Name of Patentee or Applicant of cited Document | Pages, Columns, Lines where Relevant Passages or Relevant Figures Appear |
| | 1 | 9798516 | | 2017-10-24 | Chang et al. | |
| | 2 | 9836257 | | 2017-12-05 | Chang et al. | |
| | 3 | 9836259 | | 2017-12-05 | Chang et al. | |
| | 4 | 9841935 | | 2017-12-12 | Chang et al. | |
| | 5 | RE46637 | | 2017-12-12 | Liu et al. | |
| | 6 | 6366682 | | 2002-04-02 | Hoffman et al. | |
| | 7 | 6873836 | | 2005-03-29 | Sorrells et al. | |
| | 8 | 6904527 | | 2005-06-07 | Parlour et al. | |

| | | | |
|---|------------------------|------------------|------------|
| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99) | Application Number | | 15787067 |
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| | Examiner Name | | |
| | Attorney Docket Number | FXT312CON2 | |

| | | | | | | |
|--|----|---------|--|------------|---------------|--|
| | 9 | 7095854 | | 2006-08-22 | Ginter et al. | |
| | 10 | 7451195 | | 2008-11-11 | Seligmann | |
| | 11 | 8706627 | | 2014-04-22 | Shore | |

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|-------------------|---------|--------------------|------------------------|------------------|---|--|
| | 1 | 20170364326 | | 2017-12-21 | Chang et al. | |
| | 2 | 20180011667 | | 2018-01-11 | Chang et al. | |
| | 3 | 20020051200 | | 2002-05-02 | Chang et al. | |
| | 4 | 20040127254 | | 2004-07-01 | Chang | |
| | 5 | 20170277487 | | 2017-09-28 | Chang et al. | |
| | 6 | 20180024790 | | 2018-01-25 | Chang et al. | |

| | | | |
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| | | | | | | |
|--|----|-------------|--|------------|--------------|--|
| | 7 | 20180024791 | | 2018-01-25 | Chang et al. | |
| | 8 | 20180039456 | | 2018-02-08 | Chang et al. | |
| | 9 | 20180039459 | | 2018-02-08 | Chang et al. | |
| | 10 | 20180046418 | | 2018-02-15 | Chang et al. | |

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FOREIGN PATENT DOCUMENTS

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|--------------------|---------|---|----------------|
| | 1 | UNITED STATES PATENT AND TRADEMARK OFFICE, Notice of Allowance for U.S. Patent Application Serial No. 15/785,190, February 23, 2018, 72 pages. | |

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| | | |
|---|------------------------|------------------|
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|------------|-------------------|---------------------|------------|
| Signature | /Peter D. Sabido/ | Date (YYYY-MM-DD) | 2018-02-26 |
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| Electronic Acknowledgement Receipt | |
|---|--|
| EFS ID: | 31891623 |
| Application Number: | 15787067 |
| International Application Number: | |
| Confirmation Number: | 9535 |
| Title of Invention: | MOBILE INFORMATION APPARATUS WITH AN APPLICATION FOR RECEIVING DIGITAL CONTENT FROM A DIGITAL CONTENT SERVICE OVER THE INTERNET AND FOR WIRELESSLY TRANSMITTING OR PLAYING AT LEAST PART OF THE RECEIVED DIGITAL CONTENT AT A BLUETOOTH ENABLE OUTPUT DEVICE |
| First Named Inventor/Applicant Name: | William Ho Chang |
| Customer Number: | 23581 |
| Filer: | Peter D. Sabido./Heidi Dutro |
| Filer Authorized By: | Peter D. Sabido. |
| Attorney Docket Number: | FXT312CON2 |
| Receipt Date: | 26-FEB-2018 |
| Filing Date: | 18-OCT-2017 |
| Time Stamp: | 17:40:06 |
| Application Type: | Utility under 35 USC 111(a) |

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| Submitted with Payment | no |
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| Document Number | Document Description | File Name | File Size(Bytes)/ Message Digest | Multi Part /.zip | Pages (if appl.) |
|-----------------|--|-----------------------------|--|------------------|------------------|
| 1 | Information Disclosure Statement (IDS) Form (SB08) | 20180226_IDS_FXT312CON2.pdf | 1035651 | no | 6 |
| | | | 7bdc1b8c3920e4cbc72d10d290600fe4ff56186484 | | |

Warnings:

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| Information: | | | | | |
| 2 | Non Patent Literature | NPL1_20180223_NOA.pdf | 2782117 | no | 72 |
| | | | 43f209844b5ce424bef581dbaad3d2d0948c0c2b | | |
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|--------------------|-----------------------|-----------------------|------------------------|
| 15/787,067 | 10/18/2017 | William Ho Chang | FXT312CON2 |

CONFIRMATION NO. 9535

PUBLICATION NOTICE



OC000000097282941

23581
KOLISCH HARTWELL, P.C.
200 PACIFIC BUILDING
520 SW YAMHILL STREET
PORTLAND, OR 97204

Title:MOBILE INFORMATION APPARATUS WITH AN APPLICATION FOR RECEIVING DIGITAL CONTENT FROM A DIGITAL CONTENT SERVICE OVER THE INTERNET AND FOR WIRELESSLY TRANSMITTING OR PLAYING AT LEAST PART OF THE RECEIVED DIGITAL CONTENT AT A BLUETOOTH ENABLE OUTPUT DEVICE

Publication No.US-2018-0041482-A1

Publication Date:02/08/2018

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The above-identified application will be electronically published as a patent application publication pursuant to 37 CFR 1.211, et seq. The patent application publication number and publication date are set forth above.

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| APPLICATION NUMBER | FILING or 371(c) DATE | GRP ART UNIT | FIL FEE REC'D | ATTY. DOCKET NO. | TOT CLAIMS | IND CLAIMS |
|-----------------------|--------------------------|-----------------|---------------|------------------|------------|------------|
| 15/787,067 | 10/18/2017 | 2838 | 1600 | FXT312CON2 | 11 | 1 |

CONFIRMATION NO. 9535

FILING RECEIPT



CC00000095166380

23581
KOLISCH HARTWELL, P.C.
200 PACIFIC BUILDING
520 SW YAMHILL STREET
PORTLAND, OR 97204

Date Mailed: 11/02/2017

Receipt is acknowledged of this non-provisional patent application. The application will be taken up for examination in due course. Applicant will be notified as to the results of the examination. Any correspondence concerning the application must include the following identification information: the U.S. APPLICATION NUMBER, FILING DATE, NAME OF APPLICANT, and TITLE OF INVENTION. Fees transmitted by check or draft are subject to collection. Please verify the accuracy of the data presented on this receipt. **If an error is noted on this Filing Receipt, please submit a written request for a Filing Receipt Correction. Please provide a copy of this Filing Receipt with the changes noted thereon. If you received a "Notice to File Missing Parts" for this application, please submit any corrections to this Filing Receipt with your reply to the Notice. When the USPTO processes the reply to the Notice, the USPTO will generate another Filing Receipt incorporating the requested corrections**

Inventor(s)

William Ho Chang, Vancouver, WA;
Christina Ying Liu, San Francisco, CA;

Applicant(s)

Flexiworld Technologies, Inc., Vancouver, WA;

Assignment For Published Patent Application

Flexiworld Technologies, Inc., Vancouver, WA

Power of Attorney: The patent practitioners associated with Customer Number 23581**Domestic Priority data as claimed by applicant**

This application is a CON of 09/992,413 11/18/2001
which claims benefit of 60/252,682 11/20/2000
This application 15/787,067
is a CIP of 10/053,765 01/18/2002
which claims benefit of 60/262,764 01/19/2001
This application 15/787,067
is a CIP of 13/710,299 12/10/2012 PAT 9798516
which is a CON of 12/903,048 10/12/2010 PAT 8332521
which is a CON of 10/016,223 11/01/2001 PAT 7941541
which claims benefit of 60/245,101 11/01/2000

Foreign Applications for which priority is claimed (You may be eligible to benefit from the **Patent Prosecution Highway** program at the USPTO. Please see <http://www.uspto.gov> for more information.) - None.

Foreign application information must be provided in an Application Data Sheet in order to constitute a claim to foreign priority. See 37 CFR 1.55 and 1.76.

Permission to Access Application via Priority Document Exchange: Yes

Permission to Access Search Results: Yes

Applicant may provide or rescind an authorization for access using Form PTO/SB/39 or Form PTO/SB/69 as appropriate.

If Required, Foreign Filing License Granted: 11/01/2017

The country code and number of your priority application, to be used for filing abroad under the Paris Convention, is **US 15/787,067**

Projected Publication Date: 02/08/2018

Non-Publication Request: No

Early Publication Request: No

Title

MOBILE INFORMATION APPARATUS WITH AN APPLICATION FOR RECEIVING DIGITAL CONTENT FROM A DIGITAL CONTENT SERVICE OVER THE INTERNET AND FOR WIRELESSLY TRANSMITTING OR PLAYING AT LEAST PART OF THE RECEIVED DIGITAL CONTENT AT A BLUETOOTH ENABLE OUTPUT DEVICE

Preliminary Class

323

Statement under 37 CFR 1.55 or 1.78 for AIA (First Inventor to File) Transition Applications: No

PROTECTING YOUR INVENTION OUTSIDE THE UNITED STATES

Since the rights granted by a U.S. patent extend only throughout the territory of the United States and have no effect in a foreign country, an inventor who wishes patent protection in another country must apply for a patent in a specific country or in regional patent offices. Applicants may wish to consider the filing of an international application under the Patent Cooperation Treaty (PCT). An international (PCT) application generally has the same effect as a regular national patent application in each PCT-member country. The PCT process **simplifies** the filing of patent applications on the same invention in member countries, but **does not result** in a grant of "an international patent" and does not eliminate the need of applicants to file additional documents and fees in countries where patent protection is desired.

Almost every country has its own patent law, and a person desiring a patent in a particular country must make an application for patent in that country in accordance with its particular laws. Since the laws of many countries differ in various respects from the patent law of the United States, applicants are advised to seek guidance from specific foreign countries to ensure that patent rights are not lost prematurely.

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Applicants may wish to consult the USPTO booklet, "General Information Concerning Patents" (specifically, the section entitled "Treaties and Foreign Patents") for more information on timeframes and deadlines for filing foreign

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patent applications. The guide is available either by contacting the USPTO Contact Center at 800-786-9199, or it can be viewed on the USPTO website at <http://www.uspto.gov/web/offices/pac/doc/general/index.html>.

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Title 37, Code of Federal Regulations, 5.11 & 5.15

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| PATENT APPLICATION FEE DETERMINATION RECORD Substitute for Form PTO-875 | | | | | | Application or Docket Number 15/787,067 | |
|--|---|----------------------------------|------------|------------------------------------|---------------|--|--------------|
| APPLICATION AS FILED - PART I | | | | | | | |
| (Column 1) | | (Column 2) | | SMALL ENTITY | | OTHER THAN SMALL ENTITY | |
| FOR | NUMBER FILED | NUMBER EXTRA | RATE(\$) | FEE(\$) | | RATE(\$) | FEE(\$) |
| BASIC FEE (37 CFR 1.16(a), (b), or (c)) | N/A | N/A | N/A | | | N/A | 280 |
| SEARCH FEE (37 CFR 1.16(k), (l), or (m)) | N/A | N/A | N/A | | | N/A | 600 |
| EXAMINATION FEE (37 CFR 1.16(o), (p), or (q)) | N/A | N/A | N/A | | | N/A | 720 |
| TOTAL CLAIMS (37 CFR 1.16(i)) | 11 | minus 20 = * | | | | x 80 = | 0.00 |
| INDEPENDENT CLAIMS (37 CFR 1.16(h)) | 1 | minus 3 = * | | | | x 420 = | 0.00 |
| APPLICATION SIZE FEE (37 CFR 1.16(s)) | If the specification and drawings exceed 100 sheets of paper, the application size fee due is \$310 (\$155 for small entity) for each additional 50 sheets or fraction thereof. See 35 U.S.C. 41(a)(1)(G) and 37 CFR 1.16(s). | | | | | | 0.00 |
| MULTIPLE DEPENDENT CLAIM PRESENT (37 CFR 1.16(j)) | | | | | | | 0.00 |
| * If the difference in column 1 is less than zero, enter "0" in column 2. | | | TOTAL | | | TOTAL | 1600 |
| APPLICATION AS AMENDED - PART II | | | | | | | |
| AMENDMENT A | (Column 1) | | (Column 2) | | (Column 3) | | SMALL ENTITY |
| | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | | RATE(\$) |
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = | x | = |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | x | = |
| | Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | |
| TOTAL ADD'L FEE | | | | | | | |
| AMENDMENT B | (Column 1) | | (Column 2) | | (Column 3) | | SMALL ENTITY |
| | | CLAIMS REMAINING AFTER AMENDMENT | | HIGHEST NUMBER PREVIOUSLY PAID FOR | PRESENT EXTRA | | RATE(\$) |
| | Total (37 CFR 1.16(i)) | * | Minus | ** | = | x | = |
| | Independent (37 CFR 1.16(h)) | * | Minus | *** | = | x | = |
| | Application Size Fee (37 CFR 1.16(s)) | | | | | | |
| | FIRST PRESENTATION OF MULTIPLE DEPENDENT CLAIM (37 CFR 1.16(j)) | | | | | | |
| TOTAL ADD'L FEE | | | | | | | |
| * If the entry in column 1 is less than the entry in column 2, write "0" in column 3. ** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 20, enter "20". *** If the "Highest Number Previously Paid For" IN THIS SPACE is less than 3, enter "3". The "Highest Number Previously Paid For" (Total or Independent) is the highest found in the appropriate box in column 1. | | | | | | | |

Doc code: IDS

Doc description: Information Disclosure Statement (IDS) Filed

PTO/SB/08a (03-15)

Approved for use through 07/31/2016. OMB 0651-0031

U.S. Patent and Trademark Office; U.S. DEPARTMENT OF COMMERCE

Under the Paperwork Reduction Act of 1995, no persons are required to respond to a collection of information unless it contains a valid OMB control number.

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| INFORMATION DISCLOSURE STATEMENT BY APPLICANT (Not for submission under 37 CFR 1.99) | Application Number | | 15787067 |
| | Filing Date | | 2017-10-18 |
| | First Named Inventor | William Ho Chang | |
| | Art Unit | | |
| | Examiner Name | | |
| | Attorney Docket Number | | FXT312CON2 |

| U.S.PATENTS | | | | | | | Remove |
|-------------------|---------|---------------|------------------------|------------|---|--|--------|
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| | Filing Date | | 2017-10-18 |
| | First Named Inventor | William Ho Chang | |
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CERTIFICATION STATEMENT

Please see 37 CFR 1.97 and 1.98 to make the appropriate selection(s):

That each item of information contained in the information disclosure statement was first cited in any communication from a foreign patent office in a counterpart foreign application not more than three months prior to the filing of the information disclosure statement. See 37 CFR 1.97(e)(1).

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See attached certification statement.

The fee set forth in 37 CFR 1.17 (p) has been submitted herewith.

☒ A certification statement is not submitted herewith.

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| Signature | /Peter D. Sabido/ | Date (YYYY-MM-DD) | 2017-10-25 |
| Name/Print | Peter D. Sabido | Registration Number | 50353 |

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No documents available for this priority number.



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Local-printing providing on customer computer

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KART KUISS EDVODE [US] ± (MARK JUSERVE HARMTZ, ; MARK
WENY VANDVILER, ; KUISS EDVODE KART)

Applicant(s): INT BUSINESS MACHINE CO [US] ± (INTERNATIONAL BUSINESS
MACHINE CO, ; IBM CORP)

Classification: - **international:** **B41J29/38**; **G06F13/00**; **G06F3/12**; (IPC1-
7): G06F17/00; G06F3/12
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**Application
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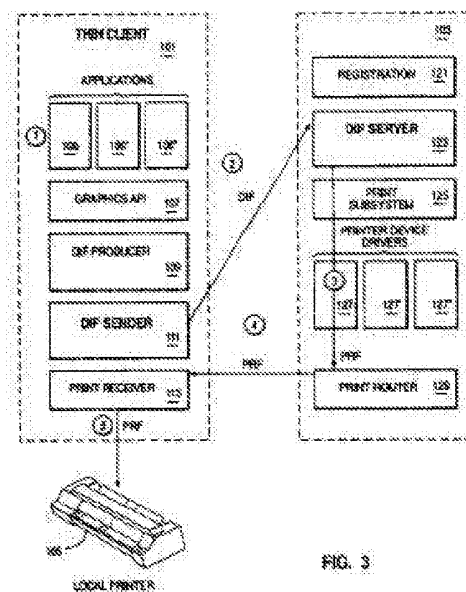
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Abstract not available for CN1217503 (A)

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A print rendering server system in a networked computing environment performs many of the most computationally intensive tasks in the overall print process for a plurality of resource limited clients. In response to a print request from a client, a print job in a print ready format is produced by the print server system and is then sent back for local printing at the resource limited client system. Also disclosed is a thin client running applications making print requests using graphics API calls and further comprising a device independent format (DIF) generator for generating a DIF datastream from the graphics API calls, and a DIF sender for routing the DIF datastream and printer information via a network to a print rendering server. The advantages of the invention are that it allows a thin client to remain of limited physical resources (memory, hard disk space, processing power etc.) without the need to process printer spooling and control functions, or maintain locally a large set of resources (such as drivers) for different types of printer.

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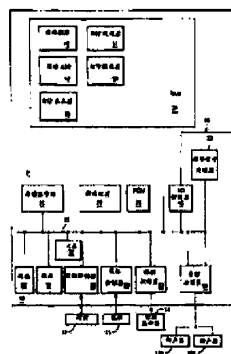
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权利要求书 5 页 说明书 10 页 附图页数 4 页

[54]发明名称 在瘦客户机上提供本地打印

[57]摘要

网络计算环境中的打印格式转换服务器系统,用于为多个资源有限的客户执行整个打印过程中许多最繁重的计算的任务。响应来自于客户的打印请求,生成打印准备格式的打印作业,并发送回去由资源有限的客户系统执行本地打印。



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权 利 要 求 书

1、对资源有限的客户系统进行本地打印的方法，包括步骤：

在客户系统，从用于本地打印的常驻应用程序接收打印请求；

通过网络向打印格式转换服务器发送打印请求；

在打印格式转换服务器，将打印请求转换为与设备相关的数据流；

通过网络将与设备相关的数据流发送给客户系统本地的打印机；

接收与设备相关的数据流以在本地打印机进行打印。

2、根据权利要求 1 所述的方法，其特征在于，来自于常驻应用程序的打印请求被作为图形 API 调用集接收，方法进一步包括在客户系统中将图形 API 调用转换为与设备无关的格式的步骤。

3、根据权利要求 2 所述的方法，其特征在于，打印请求包括与设备无关的格式的打印作业，作业属性，打印机属性和路由信息。

4、根据权利要求 3 所述的方法，其特征在于，路由信息包括没有直接连接到客户系统的本地打印机的地址。

5、根据权利要求 4 所述的方法，其特征在于，本地打印机与网络直接相连。

6、根据权利要求 1 所述的方法，其特征在于，发送给打印格式转换服务器的打印请求包括具有客户系统地址的路由信息以使在客户系统执行接收的步骤。

7、根据权利要求 1 所述的方法，其特征在于，还包括控制与设备相关的数据流以避免在接收设备发生本地假脱机。

8、根据权利要求 1 所述的方法，其特征在于，客户系统通过无线传输装置与网络相连。

9、一种计算机网络，包括：

多个资源有限的客户系统，其中至少一个包括：

多个应用程序，用于通过图形 API 调用周期性地产生打印请求；

DIF 生成器，用于从接收的图形 API 调用生成与设备无关的格式的

数据流；

DIF 发送器，用于通过网络向打印格式转换服务器发送与设备无关的格式的数据流和打印机及路由信息；

打印格式转换服务器，用于将与设备无关的数据流转换为与设备相关的数据流；

打印路由器，用于根据路由信息，通过网络向打印机发送与设备相关的数据流；

打印接收器，用于接收耦合到打印机的与设备相关的数据流；及

打印机，用于根据与设备相关的数据流进行打印。

10、根据权利要求 9 所述的网络，其特征在于，打印机信息包括作业属性和打印机属性信息。

11、根据权利要求 9 所述的网络，其特征在于，DIF 生成器和 DIF 发送器位于第一客户系统，打印接收器位于第二客户系统。

12、根据权利要求 9 所述的网络，其特征在于，DIF 生成器和 DIF 发送器位于第一客户系统，打印接收器位于与网络直接相连的打印机处。

13、根据权利要求 9 所述的网络，其特征在于，DIF 生成器、DIF 发送器和打印机接收器位于第一客户系统。

14、根据权利要求 9 所述的网络，其特征在于，打印接收器还包括用于与设备相关的数据流的控制装置，以避免在接收设备发生本地假脱机。

15、根据权利要求 9 所述的网络，其特征在于，至少一个客户系统通过无线传输装置与网络相连。

16、根据权利要求 9 所述的网络，其特征在于，客户系统是网络计算机，其特征是具有一个客户映像，包括 DIF 生成器和 DIF 发送器，在与网络相连是由服务器下载。

17、根据权利要求 9 所述的网络，其特征在于，还包括一个全局目录服务，用于在网络中注册打印格式转换服务器。

18、一种包括处理器，存储器和网络连接器的打印格式转换服务器，包括：

用于通过网络从发送请求的客户系统接收与设备无关格式的数据流和打印机及路由信息的装置；

打印机驱动程序，用于将与设备无关的数据流转换为与设备相关的数据流；

打印路由器，用于根据路由信息，通过网络向打印机请求的客户系统发送与设备相关的数据流。

19、根据权利要求 18 所述的服务器，其特征在于，包括一组打印机驱动程序，每个用于为不同的打印机将与设备无关的数据流转换为与设备相关的数据流。

20、根据权利要求 18 所述的服务器，其特征在于，打印机信息包括作业属性和打印机属性信息。

21、根据权利要求 18 所述的服务器，其特征在于，还包括注册装置，用于在网络的全局目录中注册服务器。

22、根据权利要求 21 所述的服务器，其特征在于，还包括查询装置，用于为另一个支持打印转换的打印格式转换服务器查询全局目录服务，以查询所希望的打印机。

23、一种资源有限的客户系统，包括处理器，存储器和网络连接器，包括：

多个应用程序，用于通过图形 API 调用周期性地产生打印请求；

DIF 生成器，用于从接收的图形 API 调用生成与设备无关的格式的数据流；以及

DIF 发送器，用于通过网络向打印格式转换服务器发送与设备无关的格式的数据流和打印机及路由信息。

24、根据权利要求 23 所述的客户系统，其特征在于，还包括一个打印接收器，用于从打印格式转换服务器接收与设备相关的数据流。

25、根据权利要求 24 所述的客户系统，其特征在于，还包括一个

本地打印机，用于根据与设备相关的数据流进行打印。

26、根据权利要求 24 所述的客户系统，其特征在于，打印接收器还包括一个用于与设备相关的数据流的控制装置以避免本地假脱机。

27、根据权利要求 23 所述的客户系统，其特征在于，网络连接器还包括一个用于将客户系统连接到网络上的无线传输装置。

28、根据权利要求 23 所述的客户系统，其特征在于，客户系统是网络计算机，其特征是具有一个客户映象，包括 DIF 生成器和 DIF 发送器，由与网络相连的服务器下载。

29、位于计算机可读存储器中用于打印转换服务的计算机程序产品，包括：

用于通过网络从发送请求的客户系统接收与设备无关的格式的数据流和打印机及路由信息的装置；

打印机驱动程序，用于将与设备无关的数据流转换为与设备相关的数据流；

打印路由器，用于根据路由信息，通过网络向请求打印的客户系统所要求的打印机发送与设备相关的数据流。

30、根据权利要求 29 所述的产品，其特征在于，包括一组打印机驱动程序，每个用于为不同的打印机将与设备无关的数据流转换为与设备相关的数据流。

31、根据权利要求 29 所述的产品，其特征在于，还包括注册装置，用于在网络的全局目录中注册服务器。

32、根据权利要求 31 所述的产品，其特征在于，还包括查询装置，用于为另一个支持打印转换的打印格式转换服务器查询全局目录服务，以查询所希望的打印机。

33、计算机可读介质中的计算机程序产品，包括：

用于接收图形 API 调用的打印请求的装置；

DIF 生成器，用于从接收的图形 API 调用生成与设备无关的格式的数据流；

DIF 发送器，用于通过网络向打印格式转换服务器发送与设备无关的格式的数据流和打印机及路由信息。

34、根据权利要求 33 所述的产品，其特征在于，还包括一个打印接收器，用于从打印格式转换服务器接收与设备相关的数据流。

35、根据权利要求 34 所述的产品，其特征在于，打印接收器还包括一个用于与设备相关的数据流的控制装置以避免本地假脱机。

说明书

在瘦客户机上提供本地打印

本发明一般涉及信息处理系统网络的领域。尤其涉及在具有有限资源所连接的系统（此处有时被称为瘦客户机）上提供打印支持的方法和系统。

众所周知，可以向计算机系统提供一台打印机，以作为计算机系统的输出提供永久记录的一种方法。但是由于具有不同的接口的打印机的数量和具有不同的种类的文档格式的数量已经增加了，因此使得在典型的计算机环境下提供完全打印支持变得复杂起来。计算机和打印机硬件和软件的设计者已经尝试通过使用一个或多个打印驱动程序将应用程序的开发者与环境及设备的具体属性无关。尽管他们取得了很大成功，但是却相应地增加了对打印驱动程序的附加要求和也增加了用于系统资源的相关软件。

最近的一种降低网络计算机系统的成本的努力是网络计算机或称为“瘦客户机”的开发。这些设备的特征是，与当前的个人计算机相比，具有有限的本地系统资源并且更大程度地依赖于大型系统。

对于具有有限资源的连接系统很难实现完全的本地打印支持功能，因为需要大容量的随机访问存储器和磁盘空间，并且要有适当的处理器速度，网络计算机的开发也复杂起来。一个典型的打印驱动程序仅需要建立 2 兆字节的磁盘空间。当驱动程序和其所需的系统部件，例如假脱机系统、光栅分块/日志代码及端口驱动程序一起安装时，打印驱动程序就占用了大量的用作代码空间的系统存储区。当驱动程序进行打印作业时，打印驱动程序可以使用 1 到 64 兆位的数据存储器来光栅扫描页面。用于降低存储器需求的技术，例如分块打印技术，使驱动程序变得复杂并增加了驱动程序的开发时间。而且这些技术只针对与存储器的使用有关的处理器及磁盘应用。当使用打印机时，必须提供磁盘假脱机。

根据作业的大小、打印作业的个数和使用的打印语言，假脱机系统所需要的磁盘空间从几兆字节到几百兆字节不等。

显然，这种庞大的需求使得尤其需要提供可靠的建立在瘦型或限定资源客户机基础上的本地打印支持。在当今的信息处理系统中，基于具有有限资源的系统的本地打印要么不存在，或是有限的，或是复杂的，要么强调资源。现有技术中的一种解决方案是不允许在瘦客户机上进行本地打印。这就迫使这些系统的用户使用服务器打印或者人工地将文件加载到其它系统进行打印。这种方法没有本地打印那样方便。

现有技术中的另一种解决方案是，通过减少对于一个或多个简单设备的支持及限制假脱机和/或限制打印能力例如仅打印文本，来限制本地打印的范围和功能度。这种方法太受限制不适用于通用。

最常用的现有技术解决方案是，象与网络连接的个人计算机上的情况那样，增加要求本地打印的瘦客户机上的资源并在客户机上转换打印文件。这种方法增加了每个系统的成本和复杂度，使由网络计算机系统的优势所带来的成本节约被破坏。

因此，需要在网络计算机环境中提供一种经济的、全功能本地打印功能。

本发明的一个目的是为资源受限制的客户机上提供本地打印。

本发明的另一个目的是避免增加由本地打印供给客户机所需的资源。

本发明的另一个目的是在瘦客户机的本地打印机上打印所有种类的文本。

本发明的另一个目的是显著地减少通常由其它系统任务使用对本地打印所需的系统资源。

本发明的另一个目的是支持各种位于瘦客户机附近或与其相连的本地打印机类型。

本发明再一个目的是充分地发挥与瘦客户机相连的本地打印机的功能。

本发明的这些和其它目的是通过使用一个打印格式转换服务器系统来执行整个打印处理中最繁重的计算任务。生成打印准备格式的打印作业并发送回去由资源有限的客户机进行本地打印。

处理在客户系统开始，其中从用于进行本地打印的常驻应用程序接收打印请求。通过一个网络将打印请求发送到打印格式转换服务器。在打印格式转换服务器，打印请求被转换为打印准备格式的打印作业。通过网络将处于打印准备格式的打印作业发送回客户系统的本地打印机。因此不需将瘦客户机的大量系统资源投入打印子系统就可以在本地打印机打印打印作业。

通过参考附图和以下的描述，将更容易理解本发明的目的、特征和优点。

图 1 为根据本发明的教导的计算机系统的配置图。

图 2 为现有技术中用于打印的一些软件的系统方框图。

图 3 为根据本发明的教导配置的瘦客户机和服务器的方框图。

图 4 为本发明处理的方框图。

本发明可以运行在多种计算机或具有各种操作系统的计算机集成系统中。计算机例如可以是手持计算机装置，网络计算机，个人计算机，小型计算机，大型计算机或运行在其它计算机的分布式网络中的一台计算机。尽管计算机的具体选择仅受处理器速度和磁盘存储容量需要的限制，IBM PC 系列的计算机也可以应用于本发明。IBM 个人计算机可以运行的一个操作系统是 IBM 的 OS/2 Warp 4.0。作为选择，计算机系统可以是运行在 AIX (TM) 操作系统下的 IBM RISC System/6000(TM)系列计算机。其它计算机和操作系统是已知的。

在图 1 中，框图示出计算机 10 包括系统单元 11，键盘 12 鼠标 13 和显示器 14。系统单元 11 包括系统总线或多个系统总线 21，用于将各种部件连接起来，及使各部件之间进行通信。微处理器 22 与系统总线 21 相连并由也连接到总线 21 上的只读存储器 (ROM) 23 和随机访问存储器 (RAM) 24 支持。IBM PC 系列计算机的微处理器是包

括 386、486 或奔腾微处理器的英特尔系列微处理器之一。但是，其它微处理器包括但不限于摩托罗拉系列的微处理器如 68000、68020 或 68030 微处理器及各种精简指令集计算机 (RISC) 微处理器如 IBM 制造的 PowerPC 芯片。其它的由惠普、太阳、摩托罗拉和其它公司制造的 RISC 芯片也可以用在具体计算机中。

ROM 23 包括用于控制例如用于处理器和磁盘驱动程序及键盘间交互的基本硬件操作的基本输入输出系统 (BIOS)。RAM 24 是装入操作系统和应用程序的主存储器。存储器管理芯片 25 与系统总线 21 相连并控制直接存储器访问操作，包括在 RAM 24 和硬盘驱动程序 26 及软盘驱动程序 27 之间传输数据。CD ROM 32 也连接到系统总线 21 上，用于存储大量数据如多媒体程序或图象。

各种 I/O 控制器也与系统总线 21 相连：如键盘控制器 28，鼠标控制器 29，视频控制器 30 及音频控制器 31。其中键盘控制器 28 用于为键盘 12 提供硬件接口，鼠标控制器 29 用于为鼠标 13 提供硬件接口，视频控制器 30 用于为显示器 14 提供硬件接口，音频控制器 31 用于为扬声器 15 提供硬件接口。I/O 控制器 40 如令牌环网适配器使得可以通过网络 46 与其它相似配置的数据处理系统进行通信。

可以从本发明受益的设备类型之一为无线设备如掌上型计算机。尽管其许多部件与上述对个人计算机的描述相似，尺寸和容量比个人计算机小，这些设备一般通过在射频 (RF) 范围通过蜂窝或数字传输，而不是通过同轴电缆或其它电缆与网络相连。其它传输方法如红外或超声传输对于熟练的技术人员是已知的，但不经常用。另外，这些设备中的一些缺乏例如鼠标和键盘等输入设备，而具有其它的例如触感输入系统。

本发明的一个优选实施例是常驻在按照上述方式配置的一个或多个计算机系统的随机访问存储器 24 中的指令集 48 - 52。在计算机系统要求调用指令集之前，指令集可以存放在另外的计算机可读存储器中，例如存储在硬盘驱动程序 26 或者可装拆的存储器如可以在 CD-ROM

32 中使用的光盘或可以在软盘驱动程序 27 中使用的软盘中。另外，指令集可以存储在另外的计算机的存储器中，并且在用户要求时通过局域网或因特网等广域网将计算机可读介质上的信息发送出去。熟练的技术人员将能够理解指令集的物理存储物理地改变以电、磁或化学的方式存储它们的介质。尽管本发明中为了方便描述的原因用指令、符号、字符等来描述，读者应理解所有这些和相似的术语应与适当的物理器件相关联。

另外，本发明通常用可以与操作员相联系的术语描述。尽管所执行的操作可以响应用户输入，在构成本发明的任何操作中都不需要有操作员的动作；本发明的操作是用于处理电子信号以生成其它电子信号的机器操作。

个人计算机的一个代表性的配置示于图 2。该配置显示出在现有技术打印方法中一些主要软件模块。应用程序 76 向图形 API 层 77 发送打印调用，其中打印请求被转换为可以被打印子系统理解的格式。打印子系统可以理解的典型的格式是由 OS/2 Warp 操作系统所支持的图形对象内容体系结构（GOCA）。一般来讲，用于打印子系统的格式对于每个操作系统是唯一的。打印子系统 78 为打印请求生成、假脱机及调度打印作业。打印作业包括打印请求信息。打印子系统 78 为目标打印机 81 选择正确的设备驱动程序 79。设备驱动程序 79 使用作业和打印机属性为打印机生成并向打印机发送一个打印准备格式（PRF）的打印作业。

这种现有技术体系结构对于瘦客户机是有害的。如同在背景技术中所描述的那样，打印子系统 78 和打印机驱动程序 79 的需求可能很大，尤其当要打印大量复杂的打印作业时。

本发明提供了另一种解决方案。通过使用打印服务器为网络中的多种打印机生成数据流，包括那些附加到瘦客户机上的大量打印系统要求被转移到服务器。从而限制了对每个瘦客户机进行打印支持的再次投资。

在初始化时期，客户在初始设置时仅根据打印机的设备名称查询服务器端用于缺省作业和打印机属性的打印系统并将它们进行本地存储。然后用户可以通过用户界面为他们的本地打印修改这些属性。在打印作业的提交期间，客户将作业和打印机属性连同与设备无关的打印文件和客户路由信息发送到服务器以将数据转换为与设备相关的数据流，即打印准备格式（PRF）。

服务器使用与作业一起提交的作业和打印机属性为适当的打印机设备转换这种与设备无关的打印文件数据。并使用客户路由信息把数据发送回客户端的小接收器。客户路由信息例如为互联网 IP 地址。

当打印机忙时客户监测服务器以避免本地假脱机操作并将数据输出给本地打印机。客户系统分配存储区以保持来自于服务器的打印数据。客户端所分配的存储区容量是可配置的。当客户机在分配的存储区填满打印数据时，客户机停止接收来自于服务器的数据，直到在本地打印机已经打印了存储器中的一些或所有数据。接着，客户机重新开始从服务器接收数据。

参考图 3，瘦客户机 101 通过网络链路 102 与打印格式转换服务器 103 相连。网络链路 102 可以是一个硬件链路，如包括局域网，例如令牌环网、以太网、红外、RF 或微波链路等的电缆。用于本发明目的的瘦客户机是与任何网络连接的客户系统，即使是暂时地相连的客户系统，其中该客户系统具有有限的资源，或是用户不选择作为用于打印任务的资源。根据本发明，瘦客户机 101 可以事先配置为使用主打印格式转换服务器 103 或查询整个目录以定位主打印格式转换服务器。虽然熟练的技术人员会理解在本发明中需要使用通常应用于网络通信中的协议堆、网络适配器等设备，但是为了简单起见，在这里省略其说明。

在瘦客户机 101，应用程序 106、106' 及 106'' 是常驻内存的。瘦客户机的用户可以通过计算机用户接口访问这些应用程序并使应用程序发布一个或多个打印请求。图形 API 107 是可以用于转换文本或图形的命令集。

DIF 生成器 109 是由瘦客户机端的图形 API 层 107 调用的部件，用于从由应用程序所调用的图形 API 生成与设备无关的格式（DIF）数据流。与设备无关的打印文件的一个例子是图形对象内容体系结构（GOCA）元文件。有关 GOCA 的信息请见 Graphics Programming Interface Programming Guide, Order No. G25H-7106-00, IBM 公司出版。

DIF 生成器 109 将 DIF 数据流传送给 DIF 发送器 111。DIF 发送器 111 把 DIF 数据流发送给打印格式转换服务器 103 的 DIF 服务器 123。DIF 数据流包括作业属性、打印机属性及用于作业的路由信息。

读者应该注意，打印格式转换服务器 103 的注册部件 121 先于打印请求的开始已经使用例如 Lightweight directory Access Protocol (LDAP) 协议注册了具有全部目录服务的设备转换服务。LDAP 目录服务可以由瘦客户机所使用以找到一个适于执行打印转换服务的合适的服务器。打印格式转换服务器 103 使用目录服务以通告它们所支持的打印机和打印机驱动程序。客户也可以使用 IP 地址在支持所需的打印驱动程序的服务器中选择最接近的打印格式转换服务器。

DIF 服务器 123 接收与设备无关的格式的数据流，并使用附带的作业属性、打印机属性及路由信息将作业提交给打印子系统 125 以生成打印准备格式（PRF）数据流。打印子系统 125 是包括负责假脱机和发布打印作业的部件的设备驱动程序。打印机设备驱动程序 127、127' 和 127'' 是可以生成打印准备格式（PRF）数据流的打印格式转换服务器 103 上的部件。打印机设备驱动程序的例子可以是页面描述语言（PostScript）或打印控制语言（PCL）打印机设备驱动程序。

打印路由器 129 是打印格式转换服务器 103 上的部件，用于将打印准备格式（PRF）数据流发送给在所提交的打印作业例如返回给瘦客户机 101 的作业的路由信息中所指定的目的地。

瘦客户机上的打印接收器部件 113 接收打印准备格式（PRF）数据流并将其发送到本地连接的打印机 105 上。打印接收器部件 113 包括

分配存储区监视器，以在控制的方式下接收 PRF 数据流以避免本地假脱机。在当前发明的一些实施例中，打印接收器可以在其它系统中暂时存储数据。在本发明的一些实施例中本地打印机没有实际上连接到具体的瘦客户机上，但可以连接到附近的瘦客户机或是直接与网络连接打印机。在这些情况下，打印接收器部件 113 在请求瘦客户机 101 时是不需要的。

下面将参考图 4 的流程图进一步描述根据本发明的打印一个打印作业的处理。

在步骤 201，在瘦客户机的一个应用程序中，终端用户选择一个本地打印机，以后称为“目标打印机”，以在该打印机上打印信息。然后在步骤 203，应用程序发出图形 API 调用以绘出文本和图形在目标打印机上打印信息。OS/2 的图形 API 调用例子是用 GpiCharStringAt() 转换文本，用 GpiPolygons() 转换多边形。JAVA 图形对象的图形 API 调用的例子是用 drawCharacters 转换文本用 drawPolygon 转换多边形。

在步骤 205，DIF 生成器将这些调用转换为与设备无关的格式 (DIF)。在优选实施例中，DIF 生成器通过代码和查表在图形 API 和结果 DIF 命令之间转换。在步骤 207，DIF 生成器将与设备无关的格式的打印请求发送给 DIF 服务器。该打印请求包括：(1) 用户所选择的打印信息的打印选项，即打印的份数和方向，以后称之为“作业属性”；(2) 目标打印机的制造型号，以后称之为“设备 id，如“IBM Network Printer 12”；(3) 目标打印机的设备选项，如打印存储器的容量，以后称之为“打印机属性”；(4) 通知服务器目标打印机的地址的路由信息；(5) 与设备无关的数据，即由图形 API 调用所生成的 DIF 文件。根据操作系统已知的打印协议将路由信息和打印机属性与打印作业一起传输给打印格式转换服务器。协议的一种例子可以是名称-值对，如转换服务器所接收的协议可以是 JOBNAME = Calendar Page, DATATYPE = DIF, ORIENTATION = PORTRAIT,

MEMORY = 4MB, FORM = LETTER, ROUTEINFO = 9.53, 255, 255.

在步骤 209, DIF 服务器验证来自于瘦客户机的打印请求并拒绝或接受打印请求。如果不支持 DIF 格式或者提交的客户没有授权向 DIF 提交作业, 则 DIF 服务器可能拒绝请求。在步骤 211, 如果是上述任一种情况, 则 DIF 服务器拒绝请求并向客户发一个拒绝的通知。

如果服务器接受请求, 则在步骤 213, 服务器使用设备 id 判定它是否支持目标打印机或其它 DIF 服务器是否支持该目标打印机。如果服务器支持该目标打印机, 则它处理请求。否则, 服务器通过使用例如 Lightweight directory Access Protocol(LDAP) 协议发出在全局目录上按属性查找, 以便找出另一个能支持该目标打印机的 DIF 服务器。在步骤 215, 服务器将打印请求转发给 DIF 服务器。

接着, 在步骤 217, 支持该目标打印机的 DIF 服务器调用打印机子系统。打印子系统为打印请求生成一个打印作业、并进行假脱机和调度。打印作业包含打印请求信息, 即作业属性、打印机属性、路由信息和 DIF 文件。在步骤 221, 打印子系统用设备 id 为目标打印机选择正确的设备驱动程序。在步骤 223, 设备驱动程序使用作业和打印机属性, 生成并发送打印准备格式 (PRF) 的打印作业。在步骤 225, 设备驱动程序把 PRF 作业发送到打印路由器。PRF 包括目标打印机用来打印该作业的各种命令和数据, 页面描述语言 (postscript) 就是 PRF 的一个例子。

在步骤 227, 打印路由器利用打印作业中的路由信息, 以 PRF 表示的打印作业发送给瘦型客户机的打印接收器。在步骤 231, 打印机接收器接收具有 PRF 的打印作业。最后, 在步骤 233, 打印机接收器发送作业并在目标打印机上打印之。

通过在打印格式转换服务器为大量需要计算和存储繁重的任务使用相对健全的可用资源, 可以限制用于打印的每个网络计算机的资源。然而, 本发明也使得进行本地打印十分方便, 而这些本地打印在基于几乎

纯打印服务器的解决方案中是不可能实现的。

本发明十分灵活。通过将路由信息和打印作业传输给打印格式转换服务器，服务器不需将打印准备格式发送回提交作业的瘦客户机以在与瘦客户机相连的本地打印机或任何具体的与打印机队列相关联的打印机上打印。而是，路由信息也可以将打印准备格式指定给一个不同的本地打印机，如与一个办公室同事的计算机相连的打印机。本发明也可以将文档发送给位于另一个地方的计算机或打印机，象传真机一样。另外 PRF 作业可以直接发送给与网络相连的打印机。如熟练的技术人员所知道的那样，打印机可以直接与具有网卡的网络相连，该网卡具有网络地址如因特网地址。为了将打印作业直接发送给打印机，使用包括打印机网络地址的路由信息发送 PRF 作业。

本发明通过内联网在与一个或多个服务器相连的多个网络计算机中找到具体的应用程序。在这种布局中，客户文件不是永久地存储在网络计算机中，服务器中包括客户映象。客户映象即每个客户网络计算机的软件和配置文件在登录时下载到客户网络计算机。该客户映象可以包括图 3 中瘦客户机中的软件模块，但不必包括所有与个人计算机中的定制的打印机子系统相关的打印机软件，但其中大部分被下载到了服务器上。当然，如果所有来自于客户的打印是在与网络直接相连的网络打印机上完成的，则在客户映象中不需打印接收器模块。因此可以更高效地卸载客户映象。

尽管根据具体的实施例对本发明进行了描述，熟练的技术人员将能够理解，本发明可以进行修改以适于在其它环境中使用。例如，尽管上述的发明可以在由软件选择地重新配置或激活的通用计算机中方便地实现，熟练的技术人员将能理解本发明可以用包括尤其用于实现上述发明的具体的装置的硬件、固件或软件固件硬件的组合来实现。因此在不超出所附的权利要求的范围和精神的前提下，可以对本发明进行格式和细节上的修改。

说明书附图

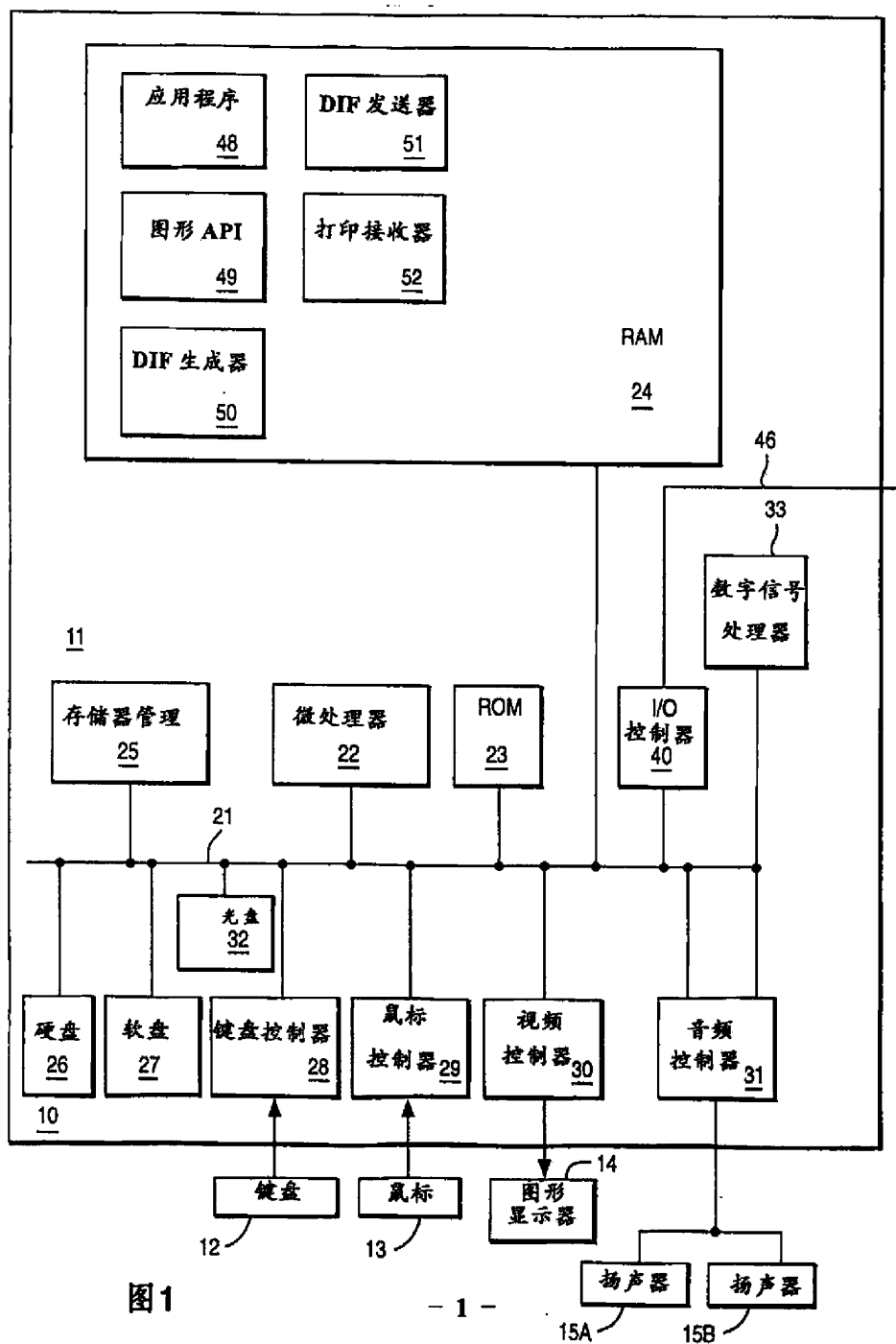


图1

- 1 -

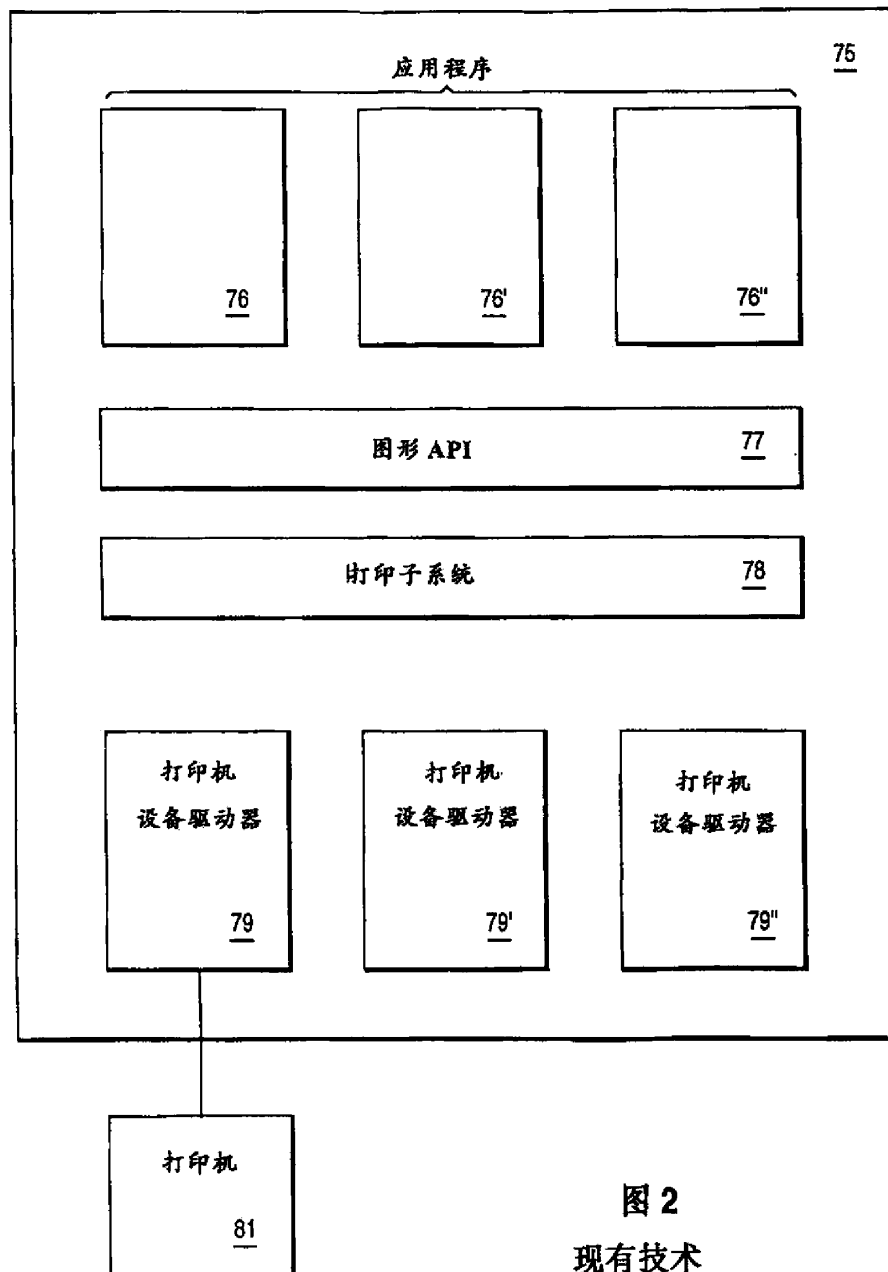


图 2
现有技术

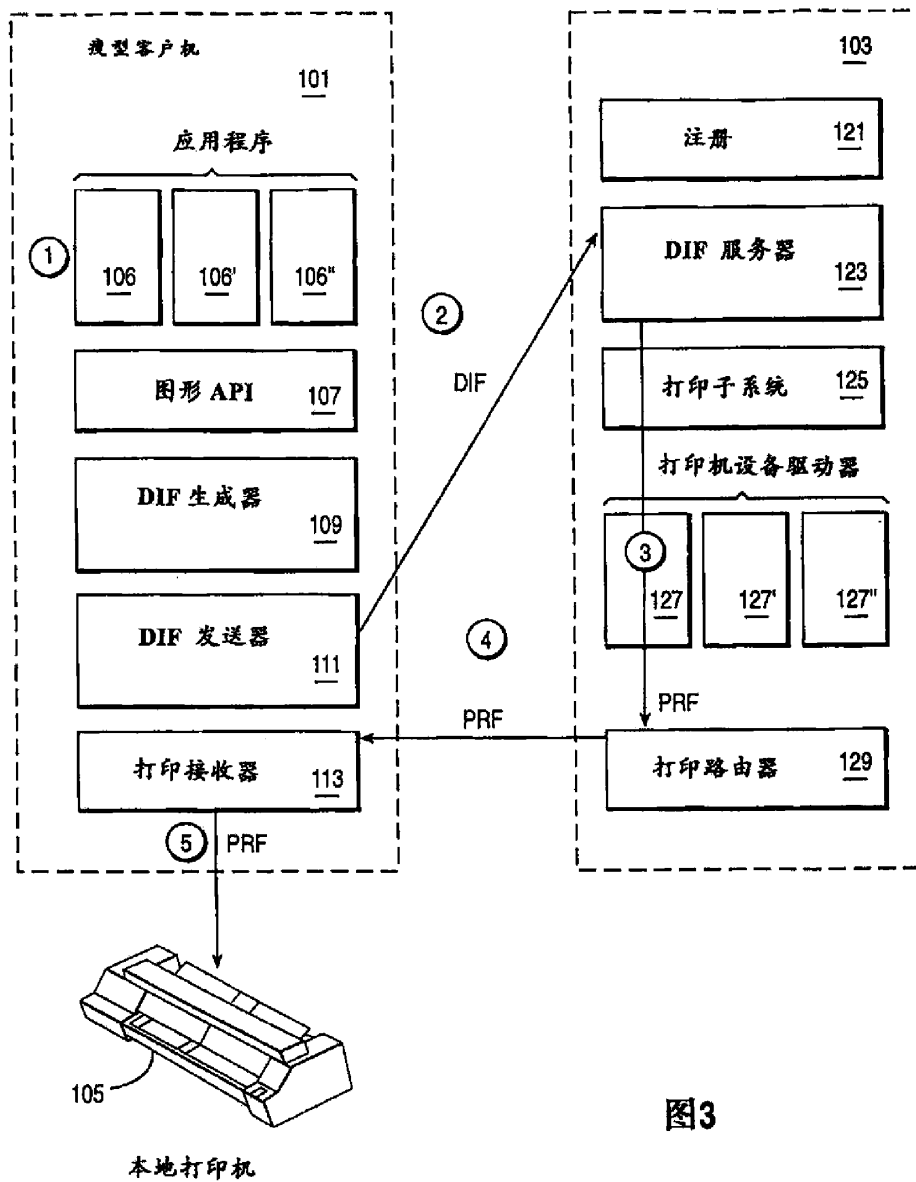


图3

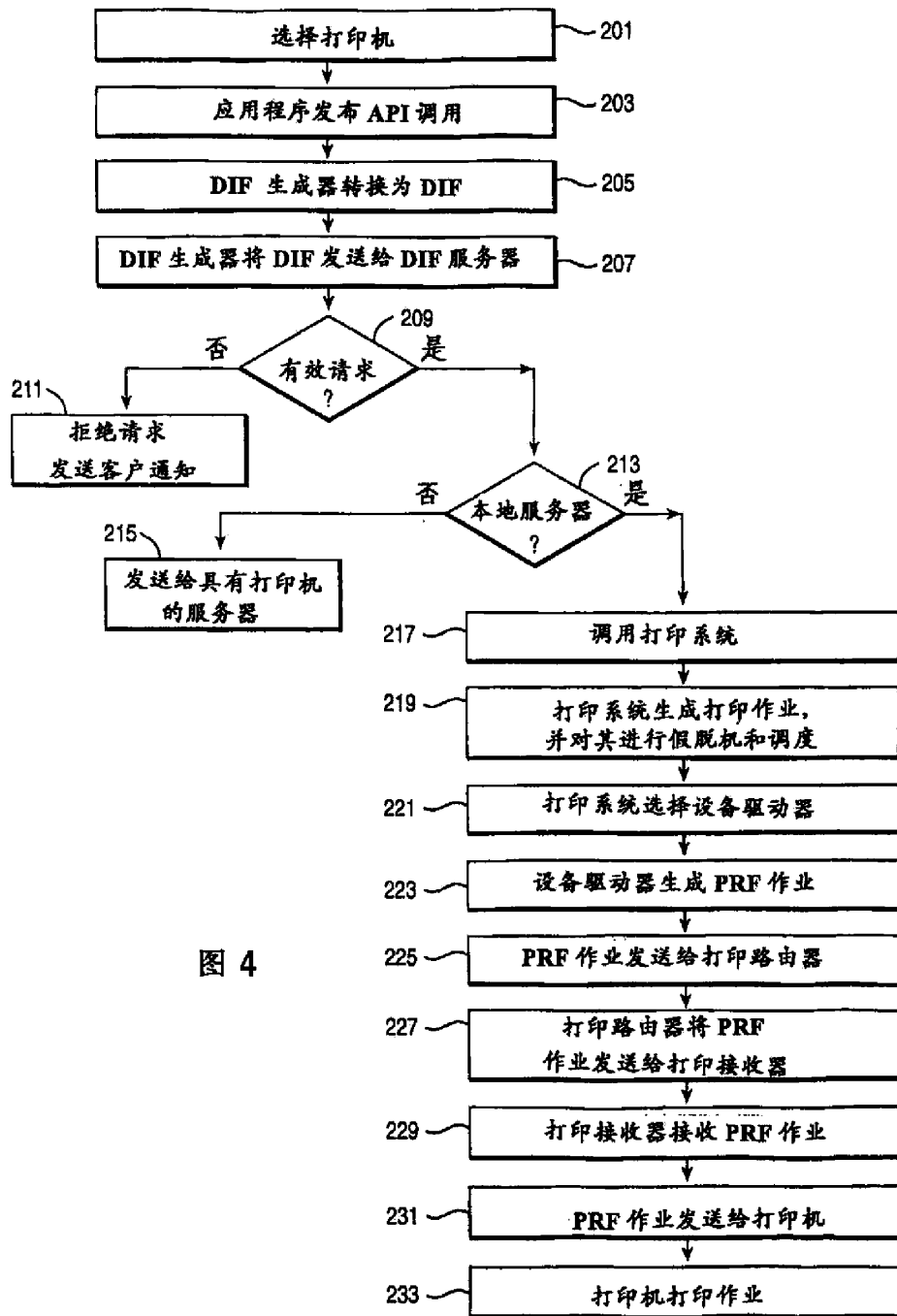


图 4

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SITE SEARCH



System and method for device-to-device pervasive digital output

| | | | |
|-------------------------------------|---|-------------------------|-------------------|
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| Applicant(s) Name | Flexiworld Technologies, Inc. | | |
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| Patent Agency Code | 11219 | Patent Agent | lu yi zhong qiang |

Abstract

An electronic system and method of pervasive output allow an information apparatus to output digital content conveniently to virtually any output device. The information apparatus includes an output manager that may be implemented as application software, a client application, or device driver. The output manager may be capable of communicating with, managing and synchronizing data (516) or software components with an output device or an output controller associated with the output device. An output controller is installed in or connected to an output device, such as a printer, to enable the output device to communicate and negotiate services (514) with an information apparatus such as mobile computing device. The information apparatus may communicate with the output controller to obtain device dependent data or software components such as device specific printer driver.

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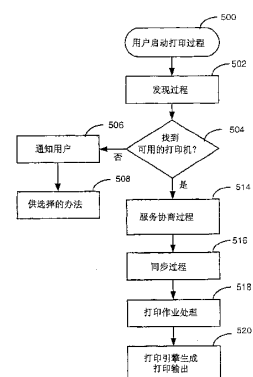
权利要求书 16 页 说明书 42 页 附图 13 页

[54] 发明名称

用于设备到设备的普适数字输出的控制器及
管理器

[57] 摘要

一种普适输出的电子系统及方法，使得信息装置可以方便地向基本上任何输出设备输出数字内容。该信息装置包括输出管理器，该输出管理器可以以应用软件、客户应用程序、或设备驱动程序实现。输出管理器能够与输出设备或同输出设备相关的输出控制器一起与数据或软件组件通信、管理并同步数据(516)或软件组件。输出控制器安装在输出设备如打印机之中或与输出设备相连，以使输出设备可以与信息装置如移动计算设备通信并协商服务(514)。信息装置可以与输出控制器通信，以得到设备相关的数据或软件组件，如由设备确定的打印机驱动程序。



1. 一种数据输出控制器，其控制信息装置与选中的输出设备之间的交互，选中的输出设备呈现从信息装置存取的数据内容，该控制器包括：

用于管理信息装置与选中的输出设备之间的通信信道的装置；

用于通过通信信道向信息装置提供与选中的输出设备相关的至少一个属性以及一个或多个设备相关的软件组件以使数据内容能够由选中的输出设备呈现的装置；和

用于通过通信信道接收至少部分地符合至少一个属性的数据内容的装置；和

用于向选中的输出设备提供要呈现的至少部分符合的数据内容的装置。

2. 如权利要求 1 的控制器，其中至少一个属性是响应于被确定为信息装置上不可用的至少一个属性而通过通信信道提供的。

3. 如权利要求 1 的控制器，进一步包含用于通过通信信道提供使得数据内容能够在选中的输出设备上呈现的一个或多个输出设备驱动程序组件的装置。

4. 如权利要求 3 的控制器，其中一个或多个输出设备驱动程序组件是响应于被确定为信息装置上不可用的一个或多个设备驱动程序组件而通过通信信道提供的。

5. 如权利要求 1 的控制器，其中一个或多个组件包括软件代码。

6. 如权利要求 1 的控制器，其中一个或多个组件包括软件应用程序。

7. 如权利要求 1 的控制器，其中一个或多个组件的每个是从包括设备驱动程序、打印机驱动程序、输出驱动程序、或用户接口的组中单独选出的一个或多个。

8. 如权利要求 1 的控制器，其中与选中的输出设备相关的属性的每个是从包括设备标识、设备批次、设备型号、设备类型、设备输入数据格式、设备输入语言、设备特征集、设备规格、设备服务质量、设备服务类型、设备服务可用性、和设备服务费用、设备验证、设备安全、设备分辨率、设备位深度、设备色空间、设备色彩数、设备色彩表、和设备半色调表的组中单独选出的一个或多个。

9. 如权利要求 1 的控制器，进一步包括用于搜索信息装置并一旦在搜索中发现就与其建立通信信道的装置。

10. 如权利要求 8 的控制器，进一步包括用于将选中的输出设备的可用性以及与选中的输出设备相关的至少一个属性一起广播的装置。

11. 如权利要求 1 的控制器，进一步包括用于被动地等待信息装置的发现并一旦有发现就建立与信息装置的通信信道的装置。

12. 如权利要求 1 的控制器，进一步包括用于提供信息装置或其操作者的验证的装置。

13. 如权利要求 1 的控制器，进一步包括用于计算输出设备呈现数据内容所需的支付的装置。

14. 如权利要求 1 的控制器，进一步包括用于处理输出设备呈现数据内容所需的支付的装置。

15. 如权利要求 1 的控制器，具有用于安装在输出设备中的结构。
16. 如权利要求 1 的控制器，具有外部连接至一个或多个输出设备的结构。
17. 如权利要求 1 的控制器，其中通信信道是无线通信信道。
18. 如权利要求 17 的控制器，其中无线通信是无线电通信。
19. 如权利要求 17 的控制器，其中无线通信是红外通信。
20. 如权利要求 1 的控制器，其中选中的输出设备是打印机。
21. 如权利要求 1 的控制器，进一步包括用于将至少部分符合的数据内容处理并转换为与选中的输出设备兼容的输出数据的装置。
22. 如权利要求 1 的控制器，进一步包括用于将至少部分符合的数据内容转换为与输出设备、打印机、打印机引擎、输出引擎、显示器引擎、或打印机控制器之一兼容的输出数据的装置。
23. 如权利要求 1 的控制器，进一步包括用于执行至少一个光栅图像处理操作的装置。
24. 如权利要求 1 的控制器，其中数据内容相应于输出作业，该控制器进一步包含用于排队并存储要提供给输出设备的一个或多个输出作业的装置。
25. 如权利要求 1 的控制器，进一步包括用于存储与一个或多个输出设备相关的一个或多个组件的装置。

26. 如权利要求 1 的控制器，进一步包括用于从信息装置得到验证信息以验证允许信息装置访问选中的输出设备的装置。

27. 一种控制数据输出控制器的方法，其控制信息装置与选中的输出设备之间的交互，选中的输出设备呈现从信息装置存取的数据内容，该方法包括：

管理信息装置与选中的输出设备之间的通信信道；

通过通信信道提供与选中的输出设备相关的至少一个属性以及一个或多个设备相关的软件组件，以使数据内容能够由选中的输出设备呈现；以及

通过通信信道接收至少部分地符合至少一个属性的数据内容；以及

向选中的输出设备提供要呈现的至少部分符合的数据内容。

28. 如权利要求 27 的方法，其中至少一个属性是响应于被确定为信息装置上不可用的至少一个属性而通过通信信道提供的。

29. 如权利要求 27 的方法，进一步包含通过通信信道提供使得数据内容能够在选中的输出设备上呈现的一个或多个输出设备驱动程序组件。

30. 如权利要求 29 的方法，其中一个或多个输出设备驱动程序组件是响应于被确定为信息装置上不可用的一个或多个设备驱动程序组件而通过通信信道提供的。

31. 如权利要求 27 的方法，其中一个或多个组件包括软件代码。

32. 如权利要求 27 的方法，其中一个或多个组件包括软件应用程序。

33. 如权利要求 27 的方法，其中一个或多个组件的每个是从包括设备驱动程序、打印机驱动程序、输出驱动程序、或用户接口的组中单独选出的一个或多个。

34. 如权利要求 1 的方法，其中与选中的输出设备相关的属性的每个是从包括设备标识、设备批次、设备型号、设备类型、设备输入数据格式、设备输入语言、设备特征集、设备规格、设备服务质量、设备服务类型、设备服务可用性、和设备服务费用、设备验证、设备安全、设备分辨率、设备位深度、设备色空间、设备色彩数、设备色彩表、和设备半色调表的组中选出单独的一个或多个。

35. 如权利要求 27 的方法，进一步包括搜索信息装置并一旦在搜索中发现就与其建立通信信道。

36. 如权利要求 35 的方法，进一步包括将控制器的可用性以及与选中的输出设备相关的至少一个属性一起广播。

37. 如权利要求 27 的方法，进一步包括被动地等待信息装置的发现并一旦有发现就建立与信息装置的通信信道。

38. 如权利要求 27 的方法，进一步包括提供信息装置或其操作者的验证。

39. 如权利要求 27 的方法，进一步包括计算输出设备呈现数据内容所需的支付。

40. 如权利要求 27 的方法，进一步包括处理输出设备呈现数据内容所需的支付。

41. 如权利要求 27 的方法，其中通信信道是无线通信信道。

42. 如权利要求 41 的方法，其中无线通信是无线电通信。

43. 如权利要求 41 的方法，其中无线通信是红外通信。

44. 如权利要求 27 的方法，其中选中的输出设备涉及打印设备、显示设备、投影设备和音频输出设备之一。

45. 如权利要求 27 的方法，进一步包括将至少部分符合的数据内容处理并转换为与选中的输出设备兼容的输出数据。

46. 如权利要求 27 的方法，进一步包括将至少部分符合的数据内容转换为与输出设备、打印机、打印机引擎、输出引擎、显示器引擎、或打印机控制器之一兼容的输出数据。

47. 如权利要求 27 的方法，进一步包括执行至少一个光栅图像处理操作。

48. 如权利要求 27 的方法，其中数据内容相应于输出作业，该方法进一步包含排队并存储要提供给输出设备的一个或多个输出作业。

49. 如权利要求 27 的方法，进一步包括存储与一个或多个输出设备相关的一个或多个组件。

50. 如权利要求 27 的方法，进一步包括从信息装置得到验证信息以验证允许信息装置访问选中的输出设备。

51. 一种数据输出控制器，其控制信息装置与选中的输出设备之间的交互，选中的输出设备呈现从信息装置存取的数据内容，该控制器包括：

用于管理信息装置与选中的输出设备之间的无线通信信道的装置；

用于通过通信信道向信息装置提供与选中的输出设备相关的至少一个组件以使数据内容能够由选中的输出设备呈现的装置；和

用于通过通信信道接收至少部分地符合至少一个组件的数据内容的装置；和

用于向选中的输出设备提供要呈现的至少部分符合的数据内容的装置。

52. 如权利要求 51 的控制器，其中至少一个组件是响应于被确定为信息装置上不可用的至少一个组件而通过通信信道提供的。

53. 如权利要求 51 的控制器，其中至少一个组件包括软件代码。

54. 如权利要求 51 的控制器，其中至少一个组件包括软件应用程序。

55. 如权利要求 51 的控制器，其中至少一个组件的每个是从包括设备驱动程序、打印机驱动程序、输出驱动程序、或用户接口的组中单独选出的一个或多个。

56. 如权利要求 51 的控制器，其中至少一个组件的每个是从包括设备标识、设备批次、设备型号、设备类型、设备输入数据格式、设备输入语言、设备特征集、设备规格、设备服务质量、设备服务类型、设备服务可用性、和设备服务费用、设备验证、设备安全、设备分辨率、设备位深度、设备色空间、设备色彩数、设备色彩表、和设备半色调表的组中单独选出的一个或多个。

57. 如权利要求 51 的控制器，进一步包括用于搜索信息装置并一旦在搜索中发现便建立信道的装置。

58. 如权利要求 57 的控制器，进一步包括用于将选中的输出设备的可用性以及与选中的输出设备相关的至少一个组件一起广播的装置。

59. 如权利要求 51 的控制器，进一步包括用于被动地等待信息装置的发现并一旦有发现就建立与信息装置的通信信道的装置。

60. 如权利要求 51 的控制器，进一步包括用于提供信息装置或其操作者的验证的装置。

61. 如权利要求 51 的控制器，进一步包括用于计算输出设备呈现数据内容所需的支付的装置。

61. 如权利要求 51 的控制器，进一步包括用于处理输出设备呈现数据内容所需的支付的装置。

62. 如权利要求 51 的控制器，具有用于安装在输出设备中的结构。

63. 如权利要求 51 的控制器，具有外部连接至一个或多个输出设备的结构。

64. 如权利要求 51 的控制器，其中无线通信是无线电通信。

65. 如权利要求 51 的控制器，其中选中的输出设备的每个是从包括打印设备、显示设备、投影设备和音频输出设备的组中单独选出的一个。

66. 如权利要求 51 的控制器，进一步包括用于将至少部分符合的数据内容处理并转换为与选中的输出设备兼容的输出数据的装置。

67. 如权利要求 51 的控制器，进一步包括用于将至少部分符合的数据内容转换为与输出设备、打印机、打印机引擎、输出引擎、显示器引擎、或打印机控制器之一兼容的输出数据的装置。

68. 如权利要求 51 的控制器，进一步包括用于执行至少一个光栅图像处理操作的装置。

69. 如权利要求 51 的控制器，其中数据内容相应于输出作业，该控制器进一步包含用于排队并存储要提供给输出设备的一个或多个输出作业的装置。

70. 如权利要求 51 的控制器，进一步包括用于存储与一个或多个输出设备相关的一个或多个组件的装置。

71. 如权利要求 51 的控制器，进一步包括用于从信息装置得到验证信息以验证允许信息装置访问选中的输出设备的装置。

72. 一种控制数据输出控制器的方法，其控制信息装置与选中的输出设备之间的交互，选中的输出设备呈现从信息装置存取的数据内容，该方法包括：

管理信息装置与选中的输出设备之间的无线通信信道；

通过通信信道向信息装置提供与选中的输出设备相关的至少一个组件以使数据内容能够由选中的输出设备呈现；以及

通过通信信道接收至少部分地符合至少一个组件的数据内容；以及

向选中的输出设备提供要呈现的至少部分符合的数据内容。

73. 如权利要求 72 的方法，其中至少一个组件是响应于被确定为信息装置上不可用的至少一个组件而通过通信信道提供的。

74. 如权利要求 72 的方法, 其中至少一个组件包括软件代码。

75. 如权利要求 72 的方法, 其中至少一个组件包括软件应用程序。

76. 如权利要求 72 的方法, 其中至少一个组件涉及设备驱动程序、打印机驱动程序、输出驱动程序、或用户接口的一个或多个。

77. 如权利要求 72 的方法, 其中至少一个组件涉及设备标识、设备批次、设备型号、设备类型、设备输入数据格式、设备输入语言、设备特征集、设备规格、设备服务质量、设备服务类型、设备服务可用性、和设备服务费用、设备验证、设备安全、设备分辨率、设备位深度、设备色空间、设备色彩数、设备色彩表、和设备半色调表的一个或多个。

78. 如权利要求 72 的方法, 进一步包括搜索信息装置并一旦在搜索中发现就与其建立通信信道。

79. 如权利要求 D7 的方法, 进一步包括将选中的输出设备的可用性以及与选中的输出设备相关的至少一个组件一起广播。

80. 如权利要求 72 的方法, 进一步包括被动地等待信息装置的发现并一旦有发现就建立与信息装置的通信信道。

81. 如权利要求 72 的方法, 进一步包括提供信息装置或其操作者的验证。

82. 如权利要求 72 的方法, 进一步包括计算输出设备呈现数据内容所需的支付。

83. 如权利要求 72 的方法，进一步包括处理输出设备呈现数据内容所需的支付。

84. 如权利要求 72 的方法，其中无线通信是无线电通信。

85. 如权利要求 72 的方法，其中选中的输出设备的每个是从包括打印设备、显示设备、投影设备和音频输出设备的组中单独选出的一个。

86. 如权利要求 72 的方法，进一步包括将至少部分符合的数据内容处理并转换为与选中的输出设备兼容的输出数据。

87. 如权利要求 72 的方法，进一步包括将至少部分符合的数据内容转换为与输出设备、打印机、打印机引擎、输出引擎、显示器引擎、或打印机控制器之一兼容的输出数据。

88. 如权利要求 72 的方法，进一步包括执行至少一个光栅图像处理操作。

89. 如权利要求 72 的方法，其中数据内容相应于输出作业，该方法进一步包含排队并存储要提供给输出设备的一个或多个输出作业。

90. 如权利要求 72 的方法，进一步包括存储与一个或多个输出设备相关的一个或多个组件。

91. 如权利要求 72 的方法，进一步包括从信息装置得到验证信息以验证允许信息装置访问选中的输出设备。

92. 在有权访问数据内容的信息装置中，一种用于控制数据输出管理器的方法，该数据输出管理器用于管理向选中的输出设备输出数

据内容,该方法包括:

管理信息装置与选中的输出设备之间的通信信道;

通过通信信道接收与选中的输出设备相关且使得数据内容能够由选中的输出设备呈现的一个或多个组件;

使数据内容符合输出数据,该输出数据与具有一个或多个组件的选中的输出设备相关;以及

通过通信信道将符合的数据内容引导至选中的输出设备,以将其呈现。

93. 如权利要求 92 的方法,其中通信信道包括无线通信信道。

94. 如权利要求 92 的方法,其中一个或多个组件包括设备相关的组件。

95. 如权利要求 92 的方法,其中一个或多个组件包括软件应用程序。

96. 如权利要求 92 的方法,其中一个或多个组件包括一个或多个设备驱动程序。

97. 如权利要求 96 的方法,其中一个或多个设备驱动程序包括打印机驱动程序。

98. 如权利要求 95 的方法,其中特征化输出设备的设备相关组件是从含有数据、信息、数据标识符、和信息标识符或它们的组合的组中选出的。

99. 如权利要求 98 的方法,其中数据或信息包括设备标识、设备类型、设备批次、设备型号、设备类型、设备输入数据格式、设备输入语言、输出数据类型、设备分辨率、设备位深度、设备色空间标识

符、设备色彩数、色彩表、和半色调表的一个或多个。

100. 如权利要求 98 的方法，其中数据或信息是从含有至少一个服务属性的组中选出的，至少一个服务属性表明至少一个特征集、设备规格、支付信息、验证信息、安全设置、服务质量信息、作业状态、作业优先级、作业排队或它们的组合。

101. 如权利要求 92 的方法，其中一个或多个组件包括软件代码。

102. 如权利要求 101 的方法，其中软件代码包括压缩及解压缩方法、文件转换、图形表示、图形呈现、图像处理操作、图像增强操作、色空间变换及数据转换、编码及解码技术、色彩匹配及管理方法、图像变换、内插及半色调技术的一个或多个。

103. 如权利要求 94 的方法，其中设备相关的组件是从含有至少一个用户接口控件的组中选出的，至少一个用户接口控件用于控制色彩、打印质量、打印份数、每页卡片数、每张的页数、双面、纵向或横向、安全信息、标识信息、支付信息或它们的组合的至少一个参数及调节。

104. 如权利要求 92 的方法，其中数据内容位于信息装置中。

105. 如权利要求 92 的方法，进一步包括从不同于信息装置的数据源中得到数据内容。

106. 如权利要求 92 的方法，进一步包括从位于信息装置上的数据源应用程序中得到数据内容。

107. 如权利要求 106 的方法，其中数据源应用程序不执行用于控制数据输出管理器的方法。

108. 如权利要求 106 的方法，其中数据源应用程序执行用于控制数据输出管理器的方法。

109. 如权利要求 106 的方法，其中数据内容是通过包括在信息装置中的操作系统而从数据源应用程序中得到的。

110. 如权利要求 106 的方法，其中数据内容是通过对象模型从数据源应用程序中得到的。

111. 如权利要求 92 的方法，进一步包括发现可用于呈现数据内容的一个或多个输出设备。

112. 如权利要求 111 的方法，其中发现一个或多个输出设备包括根据预定义的选择规则自动选择一个或多个输出设备之一。

113. 如权利要求 111 的方法，其中发现一个或多个输出设备包括将输出服务请求发送至一个或多个输出设备。

114. 如权利要求 111 的方法，其中发现一个或多个输出设备包括一个或多个输出设备满足输出服务需求。

115. 如权利要求 111 的方法，其中信息装置以无线通信发现一个或多个输出设备。

116. 如权利要求 111 的方法，进一步包括得到发现的一个或多个输出设备的每一个的输出设备信息。

117. 如权利要求 116 的方法，进一步包括根据发现的一个或多个输出设备的每一个的输出设备信息而在信息装置上呈现信息，并从用

户得到对选中的输出设备的选择。

118. 如权利要求 111 的方法，其中发现一个或多个输出设备包括信息装置发送输出服务请求并等待来自一个或多个输出设备的每一个的响应。

119. 如权利要求 111 的方法，其中发现一个或多个输出设备包括一个或多个输出设备公布它们的可用性，以及信息装置联系一个或多个输出设备中的每一个。

120. 如权利要求 111 的方法，其中发现一个或多个输出设备包括信息装置从服务节点得到关于一个或多个输出设备的信息，以及信息装置联系一个或多个输出设备中的每一个。

121. 如权利要求 92 的方法，其中信息装置包括移动计算设备、数字相机、膝上型计算机、台式计算机、和移动电话的至少一个。

122. 如权利要求 92 的方法，其中输出设备至少包括打印设备、显示设备、投影设备、和音频输出设备之一。

123. 如权利要求 92 的方法，其中输出设备至少包括标识引擎和呈现引擎之一。

124. 如权利要求 92 的方法，其中输出设备至少包括打印机引擎和输出引擎之一。

125. 如权利要求 92 的方法，其中无线通信至少包括无线电通信和红外通信之一。

126. 如权利要求 92 的方法，其中输出数据至少包括图像数据、

图形数据、文本数据、视频数据、音频数据、页面描述语言、置标语言、和指令之一。

127. 如权利要求 126 的方法，其中输出数据进一步至少包括安全数据和验证数据之一。

128. 如权利要求 92 的方法，其中输出数据包括压缩的数据。

用于设备到设备的普适数字输出的控制器及管理器

技术领域

本发明涉及设备同步和数字输出以及，具体而言，为信息装置提供普适（pervasive）输出。

背景技术

信息装置既指静态计算机也指移动计算设备（普适设备）。信息装置的例子包括但不限于：台式计算机、膝上型计算机、掌上计算机、个人数字助理（PDA）、可上网蜂窝电话、智能电话、传呼机、因特网仪表、电子图书、数字手柄（digital pad）、网络板（web pad）、以及数字捕获设备（如数码相机和摄像机）。输出设备 140 可以包括传真机、打印机、复印机、图像或视频显示设备、投影机、以及音频输出设备。

为简化及方便，下面的说明书中以打印机代指输出设备，以打印代指输出过程。但是应当理解，术语“打印机”和“打印”是用作简化说明书的特定例子，或者可以理解为它们是一个示例。这里使用的“打印”应适用于输出设备的定义或扩展至更大的范围，而不应构成对本发明的范围及实践的限制。

受到不断增长的带宽及处理能力以及不断增长的无线移动设备和用于普适设备的可用软件应用的推动，数以百万计的用户正在或将要使用他们的普适计算设备生成、下载并传输内容及信息。但是，普适设备的小显示屏幕不能提供好的观看体验。所以，需要用户使用户可以容易地从他们的普适计算设备向任一输出设备输出内容及信息。例如，人们需要从他们的普适信息装置直接便捷地输出，而无需依靠与用于打印的静态计算机（如台式个人计算机）同步。

为了示例，一位在飞机场在手持电脑中接收到电子邮件的信息工作者需要走到附近的打印机或传真机去打印他的电子邮件。另外，移动工作者也需要从他的移动设备中打印他的工作计划表、预约簿、名片、以及飞行时间表的副本。在另一个例子中，在便利店、加油站、或书报亭停下的旅游者需要将他刚使用他的可上网无线电话（信息装置）从因特网下载的地图的副本打印出来。在另一个例子中，刚使用PDA（信息装置）结束了股票交易或完成了电子商务交易的人需要打印出他的交易确认、发票或收据的副本。在另一个例子中，用数码相机拍照的用户需要将照片方便地在附近的打印机上打印出来。

通常，输出设备（如打印机）通过有线连接如电缆线与信息装置相连。通过使用例如无线电通信或红外通信，也可能得到无线连接。无论连接是有线的还是无线的，用户必须首先在信息装置中安装对应于特定打印机型号及批次的打印机驱动程序。使用由设备相关的或特定的驱动程序，信息装置可以处理将内容或数字文档输出至打印机输入空间。打印机输入空间相应于打印机理解的输入类型（这里指打印数据）。例如，打印机输入空间或打印数据可以包括能够由特定的打印机批次及型号所理解或使用的打印机特定的输入格式（如图像、图形、文件、数据格式）、编码、页面描述语言、置标语言、指令、协议或数据。

打印数据可以是专用的或公开的标准或二者之结合。因此，通常打印机输入空间或打印数据是设备相关的。不同的打印机型号可能确定它们自己的输入，该输入由打印机制造商为了最佳操作根据规范而设计或采用。于是，不同的打印机为了精确打印通常需要使用特定的打印机驱动程序。设备驱动程序（本例中是打印机驱动程序）可以控制、管理、通信、并向打印机输出打印数据。有时不使用打印机或设备驱动程序，而是应用软件可以包括设备驱动特征，作为它的一部分。本例中的应用程序可以处理文档并与输出设备直接通信，而无需使用

设备驱动程序。打印数据是发送至打印机的输出数据。然而，这里使用的术语“打印数据”是应用于或扩展为对施加于包括显示设备、投影设备及音频设备的任一输出设备的输出数据的更大范围及定义，且不应将其构造为对本发明的范围及实践的限制。

打印机驱动程序或应用程序的安装可以例如使用由打印机制造商提供的 CD 或软盘手动安装而实现。或者用户可能能够从网络下载特定的驱动程序或应用程序。对于家庭或办公用户，这个安装过程可以在任何地方进行，根据驱动程序的类型以及用户对计算设备及网络的熟练程度，该过程可能持续几分钟至几小时不等。即使对于即插即用型驱动程序的安装，用户仍然需要对每一打印机执行多步骤过程。这个安装和配置过程增加了对终端用户的复杂度及工作量，否则终端用户可将时间用于其它多产或可享受的工作。而且，这有可能促使许多不熟练的用户不向他们的家用计算机或网络添加新的外设（如打印机、扫描仪等），以避免安装和配置的不便。因此，需要为用户提供更为方便或简单的将数字内容输出至输出设备的途径，而没有手动寻找并安装新的设备驱动程序或打印机驱动程序的不便。如果需要，则打印机驱动程序的安装应当更加自动化且对终端用户透明。

另外，现有的打印方法可能对移动设备用户造成比家庭及办公室计算机用户高得多的挑战及困难。对于预安装设备相关的驱动程序的需求与移动（普适）计算及输出的概念相矛盾。例如，移动用户可能需要在飞机上或飞机场、加油站、便利店、书报亭、旅馆、会议室、办公室、家中等打印电子邮件、PowerPoint®演示文档、网页、或其它文档。用户在这些地点几乎不可能找到与用户的基站的批次及型号相同的打印机。因此，用户可能不得不每次在这些地点打印之前，安装并配置打印机驱动程序。或者，预安装所有可能的用户信息装置可用的数以百计甚至数以千计的打印机驱动程序通常也不是可行的选择。移动信息装置通常具有有限的内存及存储能力。因此，用户当前需要每次在以上不同位置打印之前，安装并配置打印机驱动程序。而且，

用户不会希望仅仅为了在飞机场打印一页电子邮件而寻找驱动程序或将其下载并安装。这必然是不想要且不鼓励地促进普适或移动计算的过程。因此，需要更加方便或自动化的打印方案，以使用户只需走向打印机便可容易地打印数字文档，而无需安装或预安装特定的打印机驱动程序。

网络打印可以在局域网（LAN）中部分解决上述问题。最初促成网络打印是为了允许人们共享网络中的打印资源。打印机通常使用网络适配器或网卡与网络相连。打印服务器可以用于管理打印作业（如脱机打印）。不同的客户可以将打印作业发送到打印服务器来排队、排序并管理。每一网络打印机的驱动程序可以存储在网络中（例如，在应用服务器中）并可由客户下载。

上面的结构经常用于局域网（LAN）中，如办公楼中。具有与该网络相连的移动或静止计算设备的办公室员工可以将打印作业发送至与同一网络相连的任一打印机。他或者在他的设备中预安装了所需的打印机驱动程序，或者可以在打印到特定打印机之前从 LAN 中下载驱动程序。但是一旦办公室员工离开办公楼，或者离开他的有线或无线网络覆盖区域，他就再也不能打印到他想要的任一打印机了。

在一个例子中，已经证明了局域网打印的想法可以进一步扩展至更大的公众网络因特网。在理想状况中，每一打印机和每一计算设备（信息装置）都与同一网络例如因特网相连。但是在现实中，将网络打印扩展至大的超级网络或因特网仍是不可行的。

而且，网络打印的一个缺点是较高的成本。为了将输出设备及信息装置与同一网络相连，需要安装附加的硬件和软件。因此，输出设备的成本会显著增加。除了硬件和软件成本，还需要服务费用以保持到如因特网这样的大型网络的连通性。另外，大型永久网络基础设施需要被建设并构造为适用于每一地点。

除了成本，网络打印的另一缺点是可靠性。网络打印需要在网络的硬件、软件及服务链的任一环节中都完美运行。如果链环的任一组件因为任一原因而运行减缓或不充分，则打印服务可能不可用、中断或导致不精确。

最后，网络打印的另一缺点是安全性的问题。如果机密文档或信息在达到用户面前的打印机之前必须通过整个网络，那么用户将感到不安全。可能会担心机密文档在连接的网络的任一片段中被截取、检查、复制或存储。还有可能担心文档实际上不在希望的打印机上而是在另一打印机上被打印。这个问题可能由例如目录服务软件中的错误、未更新或损坏的软件组件、不一致或不兼容的软件和/或硬件版本、或者人、软件、网络、或硬件错误的任何组合而引起。在从网络向信息装置下载软件组件（如打印机驱动程序）时也有此风险。该软件组件可能被破坏、崩溃或携带恶意攻击或病毒或被黑客篡改。破坏的软件组件可以破坏或崩溃用户的信息装置。最后，一些内部组织或局域网将拒绝试图达到它们的打印机以及其它在防火墙保护下的输出设备的未知文档。因此更希望信息的通信及交换是局部地在用户的信息装置及选择的输出设备之间进行的，都在用户的观察及检查范围之内。

因此，本发明提供了数字打印的便捷方法，用户无需为了打印而在信息装置上预安装设备相关的打印机驱动程序。

该发明可以提供用于打印的简单、优化且方便的过程。与现有的打印不同，用户无需手工从 CD、软盘安装打印机驱动程序，或从存在的静态网络的某处下载该驱动程序。使用本发明的设备及过程，通过在信息装置及具有本发明的输出控制器的打印机之间简单且自动化的同步过程，可以将所有软件组件、数据、或打印机驱动程序加载至信息装置。因此，拥有装备了本发明的输出管理器的信息装置的移动用户事实上可以在任何时间、任何地点，普适地打印至任一打印机。

进一步，对于信息装置和输出设备，本发明可以提供一种方便的方法，使用户可以信息装置打印到任一与静态永久网络具有或没有连接的打印机。通过信息装置与输出设备之间的本地通信及同步，不必为了静态网络的连通性而安装硬件和软件。因此可以减少打印成本。

另外，本发明可以提供比现有的远程网络打印方法或过程更可靠的打印方法。通过在信息装置及输出设备之间局部通信，打印过程不依赖于网络链环的各元素的完美运行。该链环可以包括例如网络连接、网络服务器、应用服务器、服务提供商及应用提供商。因此，由于处理及通信涉及更少的元素，所以在本发明下成功打印的可能性大大提高。

本发明可以进一步提供比现有的网络打印过程及技术更安全的打印过程。从用户面前的输出设备中上载或下载数据或如打印机驱动程序这样的软件组件提供了比处理来自网络中远程位置的组件更安全的感觉。人们会感到存储在大型网络中的组件更易遭受破坏（如被病毒感染）。网络中因人或软件或硬件错误而引起的错误模块或组件也会破坏信息装置的运行。另外，将机密数字文档或打印的数据直接发送至用户面前的打印机提供了比文档通过具有多个用户及服务器的的大型网络而传输更高的安全感。在现有网络打印中，文档被截取、检查、复制、存储或最终在错误打印机上打印的可能性要大得多。

根据本发明，普适输出的电子系统及方法使得信息装置可以将数字内容方便地输出至实际上的任何输出设备。信息装置可以具有中央处理单元、输入/输出控制单元、存储单元、内存单元、以及有线或无线通信单元或适配器。信息装置优选地还包括输出管理器，其可由应用软件、客户应用程序、或设备驱动程序（对于打印机是打印机驱动程序）而实现。输出管理器可以含有对包括例如位于主机信息装置的一个或多个通信芯片集的硬件及软件组件的管理及控制能力。

信息装置中的输出管理器可以与配置了本发明的输出控制器的输出设备一起通信、管理并同步数据或软件组件。输出设备的例子包括但不限于：打印机、传真机、复印机、图像或视频显示设备、监视器、显示屏幕、投影仪、以及音频输出设备。

输出控制器可以是位于输出设备中的电路板、卡或软件组件。输出控制器也可以与输出设备外部相连，作为外部组件或“盒”。输出控制器可以由嵌入式处理器、软件、固件、ASIC、DSP、FPGA、片载系统、特殊芯片集、等等中的一种或组合而实现。在另一实施例中，输出控制器的功能可以通过与输出设备外部相连的PC、工作站或服务器上运行的应用软件而提供。

输出控制器可以包括处理单元、内存/存储单元和通信适配器单元等等。输出控制器的存储及内存单元可以存储设备驱动程序、软件组件或对象封装设备相关的数据、算法、及代码。设备相关的数据可以是例如关于输出设备及输出控制器的参数及信息。软件组件及对象可以封装例如代码或可执行算法，该代码或可执行算法是将图像或文档描述符或语言转换或编码为与特定输出设备相兼容的打印数据或输出数据所需要的。输出管理器可以管理将数据和/或软件组件从输出控制器上载到信息装置的过程，从而例如使得信息装置生成打印数据或输出数据，并将其准确地发送至输出设备或输出控制器。

输出数据（或当输出设备是打印机时的打印数据）可以是特定的数据、指令、页面描述语言、置标语言、图形和/或图像文件格式等等。打印数据还可能利用一个或多个编码技术的压缩而编码或压缩。进一步，打印数据可以使用一个或多个公开标准或一个或多个专用技术及格式、或它们的组合。输出数据（或对于打印机的打印数据）指从信息装置发送至输出设备的电子数据。

本发明的数字内容输出过程的一个实现包括以下步骤。

1. 用户请求打印来自他的/她的信息装置的数字内容。
2. 信息装置通过发现过程检测可用的输出设备。
3. 在服务协商过程中，信息装置和与可用输出设备相关联的输出控制器交换服务信息。然后用户可以根据提供的服务信息，选择一个或多个输出设备。
4. 作为同步过程的一部分，信息装置与输出控制器通信，以确定并上载必需的组件，以使能够输出至特定的输出设备。然后，上载的组件或数据可以在信息装置中安装或配置。
5. 要输出的数字内容由一个或多个组件处理，以与输出设备兼容。该一个或多个组件包括具有输出管理器、输出控制器及输出设备的信息装置。
6. 打印机引擎或显示引擎或音频引擎生成最终输出。

在本发明的输出过程中，位于信息装置中的输出管理器可以参与、协调并管理主机信息装置及输出控制器之间的信息/组件的通信及交换。

附图说明

图 1 是可以实现现有发明的过程及设备的输出系统的框图。

图 2A 和图 2B 是显示无线通信单元的硬件组件的典型结构的框图。

图 3A-3C 显示了关于信息装置的输出管理器的不同结构及实现。

图 4A-4F 显示了关于打印机或输出设备的输出控制器的不同结构及实现。

图 5 是本发明的普适输出过程的流程图。

图 6 是图 5 的输出过程中可包括的服务协商过程的典型实施方式的流程图。

图 7 是图 5 的输出过程中包括的打印作业过程的不同可能结构的

流程图。

图 8A-8G 显示了信息装置的显示设备上不同时间表现的一系列图形化用户界面 (GUIs)。

图 9A-9B 是现有打印系统或打印机的框图。

具体实施方式

图 1 是显示一种电子通信系统的组件的示例框图，该系统可以提供本发明的操作系统，且包含了具有处理能力的计算设备即信息装置 100。如图 1 所示，信息装置 100 的例子可以包括但不限于：台式个人电脑 (PC)、膝上型计算机、掌上计算机、手持或移动设备、个人数字助理 (PDA)、智能电话、可视电话、机顶盒、电子图书、因特网板 (pad)、数码相机、因特网仪表、传呼机等。

信息装置 100 可以包含现有技术的组件 (未显示)，如：处理单元、内存单元、存储器单元以及输入/输出控制单元。信息装置 100 还可以包含用于与用户交互的接口 (未显示)。接口可以由软件或硬件或二者的组合而实现。这种接口的例子包括但不限于鼠标、键盘、触控式或非触控式屏幕、一个或多个按钮、软按键、指示笔、扬声器、麦克风等。

信息装置 100 可以是专用的单任务设备 (如电子邮件终端、web 终端、电子图书等) 或具有多重特征及功能的通用计算设备。这些多重的特征及功能可以由一个或多个安装在信息装置 100 中的软件应用程序 (如图 3 中的应用程序 302) 实现，该信息装置 100 可以拥有或不拥有操作系统。信息装置 100 的另一个例子是具备本发明的处理能力及特征集的数码相机 112。

一些信息装置 100 (如专用设备) 可以被制造商预先配置了固定的功能及特征。其它信息装置 100 可以允许用户安装附加的硬件元件和应用程序 (如图 3 中的应用程序 302)，以扩展或改变其功能。信息

装置 100 的功能及应用程序的例子可以包括例如：电子邮件、消息、语音通信、web 浏览、图像获取、文本处理、图形应用程序、文档或图像编辑、以及输出功能等。

信息装置 100 的功能及特征集可以以软件或硬件或二者的组合而实现。当特征以软件实现时，这个软件可以由制造商或用户安装。可以使用在嵌入式处理器上运行的嵌入式软件实现应用软件，也可在特定的操作系统上运行应用软件。应用程序及特征集的某些或全部或组合也可以以硬件或在硅片上实现。一些功能或特征集可以在特殊的芯片集中实现，且可以包含一个或多个以下部分或它们的组合：例如特定用途集成电路（ASIC）、现场可编程门阵列（FPGA）、数字信号处理器（DSP）、片载系统、固件等。

信息装置 100 可能包含或不包含操作系统。在具有操作系统的实施方式中，操作系统可能为软件应用程序提供多种应用编程接口（API）或对象模型（如图 3 中的 API 300），以使软件应用程序与设备驱动程序接口并通信。信息装置 100 中的设备驱动程序控制外设并与其通信，外设如打印机、复印机、传真机、显示器、屏幕等。正如下面参考图 3A 描述的，几个不同的应用程序可以通过使用由操作系统提供的 API 或接口或对象模型，共享公用的设备驱动程序。正如下面参考图 3B 和 3C 描述的，在不具有操作系统或操作系统不支持或提供设备驱动程序 API 的实施方式中，各应用程序不得不实现自己的设备驱动程序或自己的输出及通信能力。例如，要向打印机输出数字文档，则各应用程序不得不实现自己的打印机特定驱动、处理和/或通信能力。

在一个实现中，信息装置 100 包括通常以软件实现的输出管理器 308（图 3A-3C）。该输出管理器 308 可以实现为或包含于客户应用程序中、或作为独立的应用程序、或作为另一应用软件 302B（图 3B）的一部分、或实现为设备驱动程序（例如在打印机作为输出设备的情

况，是打印机驱动程序）的形式，它可以被一个或多个应用程序 302 调用、共享或使用（图 3A-3C）。

输出管理器 308 的一个任务是管理并协调信息装置 100 与一个或多个输出控制器 120 之间的通信。输出管理器 308 可以例如实现公开标准的或专用的通信协议，以直接或间接作用、管理、或使用由位于主机信息装置 100 中的硬件元件提供的功能。这种硬件元件可以包括例如处理单元、内存单元和通信芯片集（未显示）。输出管理器 308 可以包括一个和多个下列特征及功能：

- 输出管理器 308 可以与包含于主机信息装置 100 中的一个或多个软件应用程序 302 通信或交互，以向这些软件应用程序 302 提供普适输出能力或特征。从软件应用程序 302 传递至输出管理器 308 的信息的类型可以是例如需要输出的数字文档或数字内容数据。在一些例子中，应用软件 302 可以把输出管理器 308 作为独立的应用程序（如图 3C 所示）或应用程序整体的部分（如图 3B 所示）而调用或启动。输出管理器 308 和应用软件 302 之间可能的通信及管理的例子可以包括消息、对象模型、实例、进程调用、程序唤起及 API 等，它们可能或可能不是由操作系统提供的。

- 输出管理器 308 可以管理并保持与输出控制器 120 的有线或无线通信。输出管理器 308 可以与由它的主机信息装置 100 的硬件元件实现的功能相互作用。例如，输出管理器 308 可以管理信息装置 100 中的通信单元并与其交互。正如下面详细描述，图 2A 和 2B 显示了使用无线适配器的通信单元的例子。用户可以通过输出管理器 308 通过主机信息装置 100 提供的用户接口，与输出管理器 308 交互。

- 输出管理器 308 可以帮助发现可用的输出设备 140、检验通信连接、确认设备对于服务的有效性或兼容性、或向一个或多个设备发送或广播服务请求。

- 输出管理器 308 可以与输出控制器 120 通信，以确定必需的软件组件、数据、或可能的需要从输出控制器 120 上载到主机信息装置 100 以使普适输出成为可能的由信息或参数决定的任何其它设备。软

件组件可以是例如设备驱动程序、应用程序、特殊代码或算法、可执行对象或设备决定的数据、参数、信息等。

- 输出管理器 308 可以与输出控制器 120 配合，以将需要的组件或数据从输出控制器 120 上载到它的主机信息装置 100，使得用户可以普适地将数字内容输出至该输出控制器 120 或与它相关的输出设备 140。

- 输出管理器 308 可以执行光栅图像处理操作（例如光栅化、色彩管理、半色调操作）或将数字内容从原始格式转换为适宜输入特定的输出控制器 120 或输出设备 140 的打印数据。数字内容可以由信息装置 100 创建、存储或接收。例如，输出管理器 308 可以将数字文档信息从某种格式或语言转换为用于输出的特定的打印数据或中间格式或语言，如 PostScript、PCL、EMF、XML、TIFF、JPEG、RTL 等。

- 输出管理器 308 可以协调或管理主机信息装置 100 和输出控制器 120 之间的通信，以将打印数据发送或发射至输出控制器 120。

输出控制器 120

输出控制器 120 可以实现为软件或硬件，且可以连接至输出设备 140 或结合入输出设备 140。输出控制器 120H 说明了安装或结合在输出设备 140 内的电路板或卡形式的硬件实现，所述输出设备 140 如打印机、复印机、传真机、显示屏等。在另一结构中（未显示），输出控制器 120 可以实现为安装或结合在输出设备 140 内的软件应用程序或组件。输出控制器 120G 说明了一种硬件实现，其形式为单独连接至一个或多个输出设备 140 的外部元件或“盒”。

无论输出控制器 120 外部连接至或内部安装于输出设备 140，它可以实现为执行这里描述的输出控制器 120 的特征集及功能的硬件、软件或二者兼有。在输出设备 140 是打印机的情况下，输出控制器 120 有时也可以被称为打印服务器。下面参考图 4 描述输出控制器 120 的示例结构及实施方式。

作为一个例子，输出控制器 120 可以实现为连接至一个或多个输出设备 140 的计算机。例如，现有的 PC、工作站或服务器可以适用于输出控制器 120。在这种情况下，可以使用在连接至输出设备 140 的计算机（PC、服务器或工作站）内安装的应用软件实现输出控制器 120 的功能。

安装在输出设备 140 中或与其相连的输出控制器 120，如打印机，使输出设备 140 能够与信息装置 100 通信并协商服务。在一种实施方式中，信息装置 100 可以与连接至打印机的输出控制器 120 或安装在打印机内部以得到设备相关的数据或软件组件如设备特定打印机驱动程序 308 的输出控制器 120 通信。例如位于信息装置 100 中的输出管理器 308 这样的应用程序可以安装并配置上载的组件或数据，使得信息装置 100 直接打印至该打印机。下面参考图 5 描述输出进程的例子。

输出控制器 120 的功能和特征集可以包括以下的一个或多个：

- 向客户端提供服务——输出控制器 120 可以积极地搜索包括信息装置 100 或输出管理器 308 或其它通信单元在内的可用客户端，客户端输出服务将提供给这些可用客户端。二者择一或者结合地，输出控制器 120 可以被动地等待被包括信息装置 100 在内的一个或多个客户端发现，以向客户端提供输出服务。
- 协商与信息装置 100 的服务——作为协商要提供的输出服务的一部分，输出控制器 120 可以同信息装置 100 通信并交换信息。例如，在与信息装置 100 的通信中，输出控制器 120 可以向信息装置 100 通知对于所选的输出设备 140 如打印机的构成、型号、标识、版本、输入语言类型、设备驱动软件类型、提供的服务类型、可上载的组件的类型等。在另一个例子中，信息装置 100 可以将一条或多条消息发送至输出控制器 120，该输出控制器询问信息装置 100 在需要的情况下需要将什么软件组件或数据从输出控制器 120 上载，以使得输出至特定的输出设备 140 成为可能。
- 提供安全功能，如验证及加密——验证用于阻止对服务的多余

访问，而加密用于阻止窃听。安全程序可以在输出控制器 120 或输出设备 140 和信息装置 100 之间的通信的不同步骤及阶段，由软件、硬件或二者的组合实现。

- 付费或交易管理及服务——用户在例如向打印机 140 或其它输出设备 140 提供输出时，可以被要求支付服务费。输出控制器 120 可以有根据顾客请求或享受的服务而计算并处理付费的能力。输出控制器 120 可以处理多种形式的付费，例如：现金、电子现金、信用卡、借贷卡、电子卡、智能卡、虚拟现金等。

- 存储能力——输出控制器 120 可以包括内存或存储单元，并可以在其中存储以下的一个或多个：应用软件、设备或打印机驱动程序、软件组件、设备相关的数据或参数、用户接口等。在输出设备 140 或输出控制器 120 中存储的软件组件或数据可以上载至信息装置 100，以使信息装置 100 或输出管理器 308 驱动输出设备 140。软件组件可以是可执行的或部分可执行的程序或数据。

- 与信息装置 100 同步——在信息装置 100 中的输出控制器 120 或输出管理器 308 确定能够输出或打印所需要的组件（软件组件、数据、信息或参数）之后，输出控制器 120 可以与输出管理器 308 协调，以将输出控制器 120 的内存或存储单元中存储的组件上载至信息装置 100。

- 提供管理工具——多个信息装置 100 可以同时或在重叠时间请求来自相同输出设备 140 的服务。输出控制器 120 可以提供管理工具，如打印作业的队列及脱机打印、服务质量等。

如上所述，输出控制器 120 可以以多种方式实现，并可以包括硬件、软件、或二者的组合。例如在硬件实现中，输出控制器 120 可以包括使用一种或多种硬件类型如 ASIC、DSP、FPGA、固件、片载系统、及通信芯片集的组件。输出控制器 120 还可以包括具有软件组件的嵌入式处理器或嵌入式应用软件，以实现它的特征集和功能。输出控制器 120 可以含有或不含有操作系统。

输出控制器 120 通常包括可以存储一个或多个软件应用程序、软件组件和数据的内存或存储单元（ROM、RAM、闪存、磁盘驱动器——未显示）。一些软件应用程序可以在输出控制器 120 内运行，以执行它的功能（如，与信息装置 100 通信）。

输出控制器 120 的内存或存储单元还可以存储数据和一个或多个软件组件，在与输出管理器 308 通信期间，所述数据和一个或多个软件组件可被上载到信息装置 100 或与其同步。软件组件可以是能够在信息装置 100 上运行的设备驱动程序或完整的应用软件。一旦这样的软件组件被上载并安装，信息装置 100 就可以驱动或输出至特定的输出设备 140。

软件组件还可以是部分的设备驱动程序或部分的应用程序软件或部分的软件程序。软件组件可以是可执行的或部分可执行的程序、对象或代码。软件组件可以封装信息、算法、和数据。可以包括在软件组件中的算法的例子包括压缩/解压缩方法、文件转换、图形表现及渲染、图像处理及增强操作、色空间变换及数据转换、编码/解码技术、色彩匹配及增强方法、图像变换、内插方法、半色调技术、用户接口软件代码等。可以包括在软件组件中的数据的例子包括例如：色彩表、色空间信息、半色调表、输出设备类型、输出分辨率、位深度、输入类型、格式或语言、通信协议类型、输出状态、设备标识及签名、图形、图像及文本描述等。

这种软件组件可以上载至输出管理器 308，以方便打印数据或输出数据的通信及生成，所述打印数据或输出数据对于输出控制器 120 或输出设备 140 适合、兼容或最优。输出控制器 120 和输出管理器 308 管理并协商要上载至信息装置 100 的合适的组件。

并非所有情况都需要将整个或全部驱动程序或应用程序上载至输出管理器 308 或信息装置 100。在一些实施方式中，仅上载一个软件

组件就足够了。例如，许多喷墨打印机通常使用一位或多位 CMYK 打印技术，有时具有相似的分辨率。信息装置 100 可以预先安装较通用的打印机驱动程序，这个打印机驱动程序包含软件代码、算法及数据的设备无关的部分，它们是公用的或者可以用于整个这一类打印机。设备无关的代码可以包括例如：适用于整个这一类打印机使用的数字文档的光栅化过程（包括半色调和色彩管理方法）和图像增强。在这个例子中，仅上载较小的软件组件或数据是可行的，其中上载的软件组件或数据包括了对于特殊的打印机或输出设备 140 的设备相关的组件。设备相关的部分或组件或数据可以包括但不限于：对于打印机或输出设备 140 特定的色彩表、半色调表、输出分辨率、位深度、压缩/解压缩方法、色空间变换、编码算法或变换软件。

在输出控制器 120 的内存单元中存储的用于上载至信息装置 100 的软件组件的另一个例子是用于获取用户对打印或输出操作的偏好的安装向导或用户接口。在打印情况下的用户偏好的例子包括但不限于：色彩及打印质量参数调整、打印份数、每页的卡片（card）数目、每张（sheet）的页数、双面打印、纵向（portrait）或横向（landscape）、安全信息等。

一旦软件组件或数据被上载或安装于信息装置 100 中，信息装置 100 可以驱动或输出至输出设备 140。例如，信息装置中的应用程序 302 可以将数字文档或图像打印到打印机。

为了驱动特定的输出设备 140，不同的信息装置 100 可能需要上载不同的软件组件。因此，可以在输出控制器 120 的内存或存储元件中存储用于多个信息装置 100、操作系统及平台类型的多种软件组件和数据或设备驱动程序。

输出控制器 120 可能包含用来管理应用程序的嵌入式操作系统。有了操作系统，输出控制器 120 的一些或全部功能和特征集可以实现