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(54) IMAGE FORMING APPARATUS CAPABLE OF PERFORMING TRIAL PRINTING, AND IMAGE FORMING SYSTEM

(75) Inventors: **Akinori Iwase**, Yokosuka-shi (JP); **Yoshiko Takeda**, Yokohama-shi (JP); **Kazuhiro Ogura**, Kawasaki-shi (JP); **Takeshi Ogaki**, Tama-shi (JP)

Correspondence Address:
FOLEY AND LARDNER
SUITE 500
3000 K STREET NW
WASHINGTON, DC 20007 (US)

(73) Assignees: **KABUSHIKI KAISHA TOSHIBA**; **TOSHIBA TEC KABUSHIKI KAISHA**

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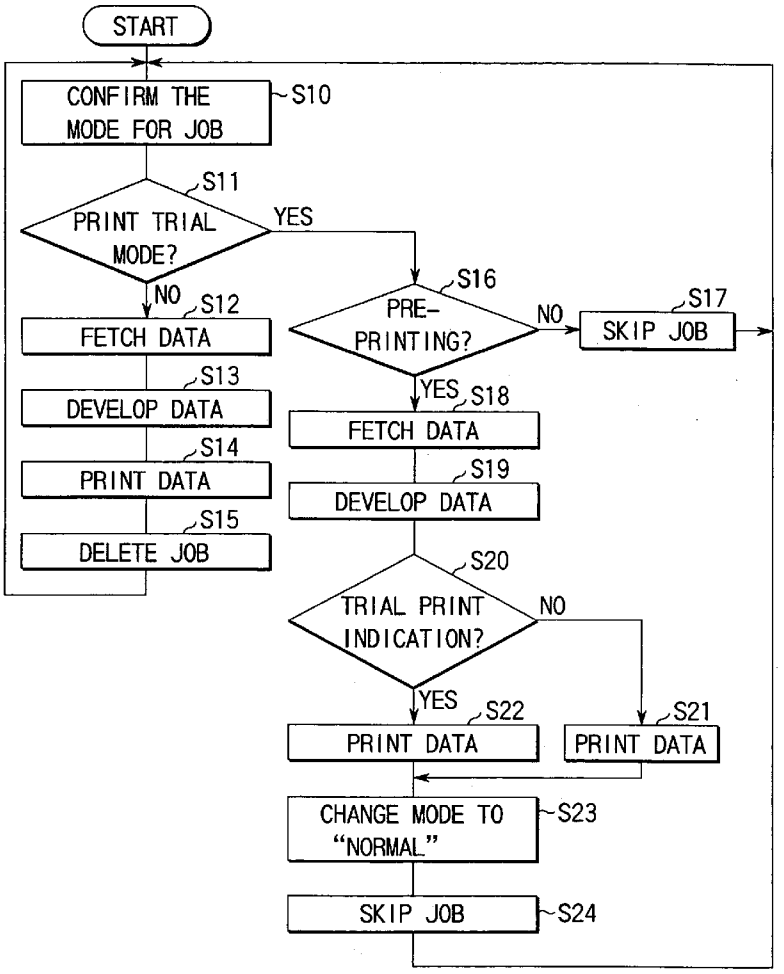
(57) **ABSTRACT**

An image forming apparatus having a receipt interface I/F, a hard disk, and a printer section. The receipt interface I/F receives pages of image data transmitted and a partial print request signal requesting that only a part of the image data be printed, both transmitted through a communication line. The hard disk stores both the image data and the partial print request signal. The printer section prints a part of the image data stored in the hard disk, in response to the partial print request signal that the receipt interface I/F has received.



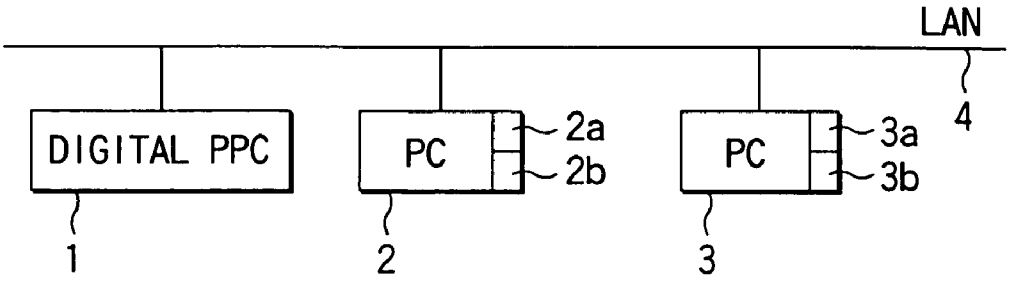

LAN
4
DIGITAL PPC
1
PC
2a
2b
2
PC
3a
3b
3

FIG. 1

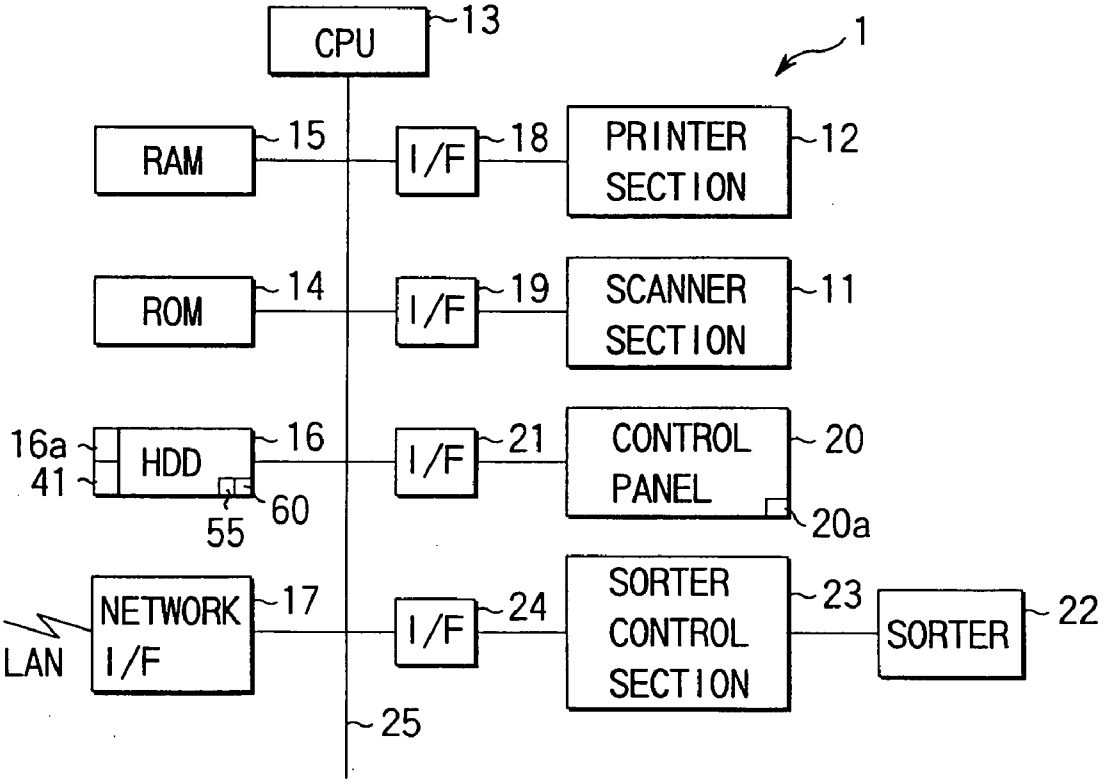

CPU
13
1
RAM
15
I/F
18
PRINTER SECTION
12
ROM
14
I/F
19
SCANNER SECTION
11
16a
41
HDD
16
55
60
I/F
21
CONTROL PANEL
20
20a
LAN
NETWORK I/F
17
I/F
24
SORTER CONTROL SECTION
23
SORTER
22
25

FIG. 2

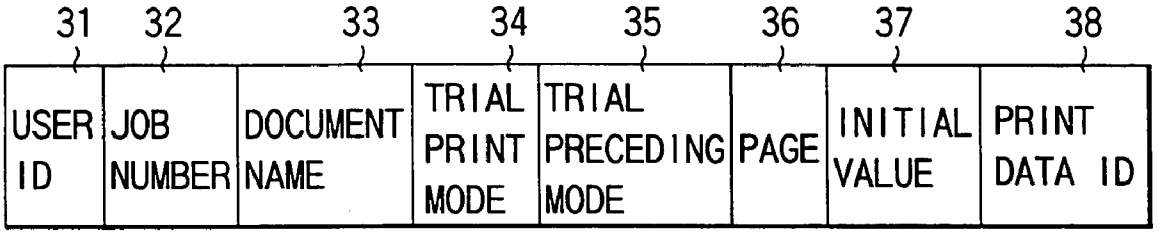

31
32
33
34
35
36
37
38
USER ID
JOB NUMBER
DOCUMENT NAME
TRIAL PRINT MODE
TRIAL PRECEDING MODE
PAGE
INITIAL VALUE
PRINT DATA ID

FIG. 3

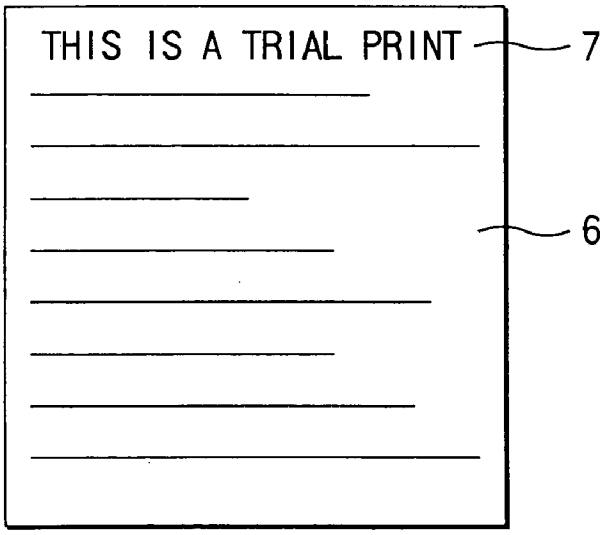
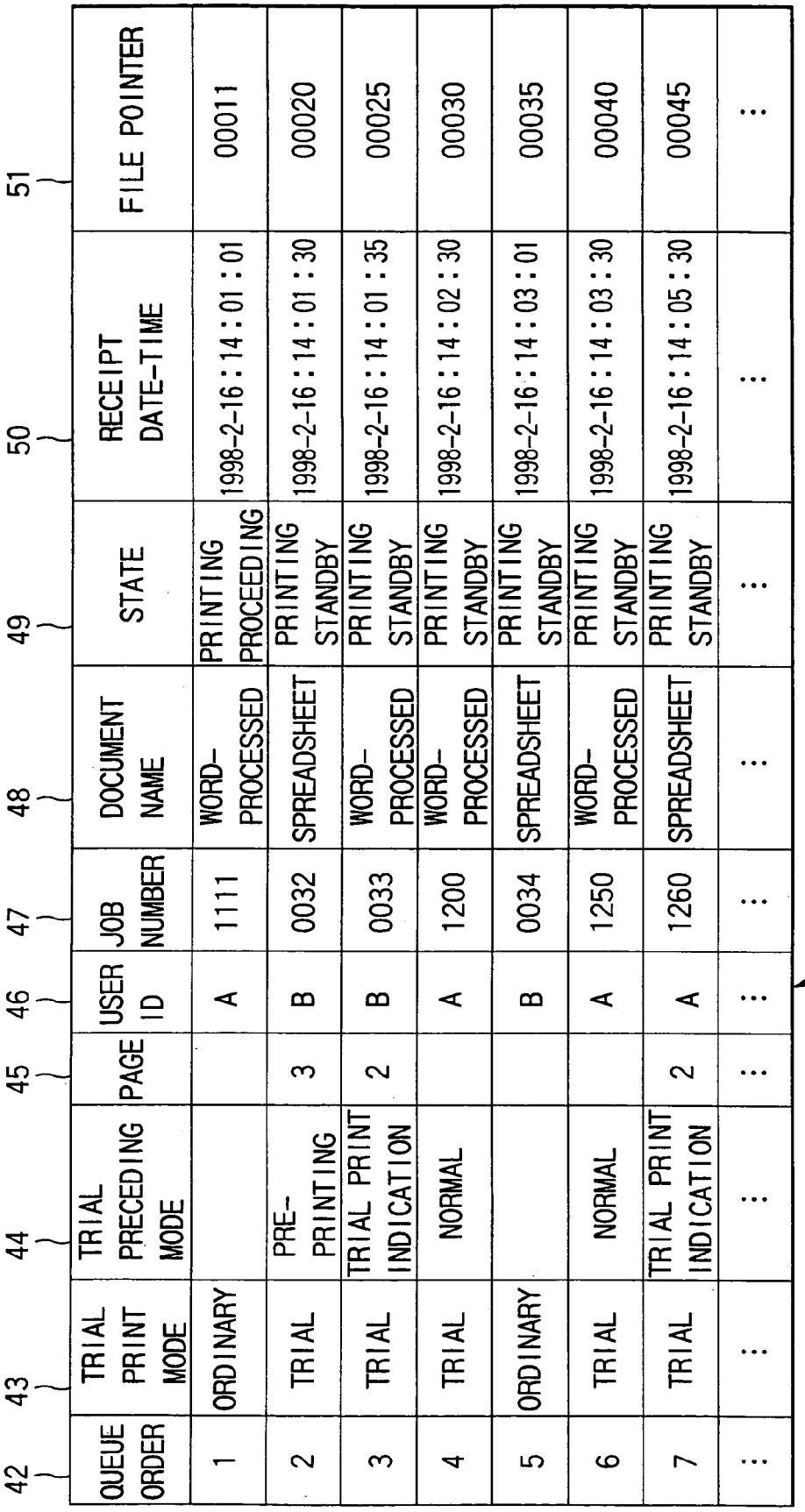

THIS IS A TRIAL PRINT
7
6

FIG. 4



42 QUEUE ORDER	43 TRIAL PRINT MODE	44 TRIAL PRECEDING MODE	45 PAGE	46 USER ID	47 JOB NUMBER	48 DOCUMENT NAME	49 STATE	50 RECEIPT DATE-TIME	51 FILE POINTER
1	ORDINARY			A	1111	WORD-PROCESSED	PRINTING PROCEEDING	1998-2-16 : 14 : 01 : 01	00011
2	TRIAL	PRE-PRINTING	3	B	0032	SPREADSHEET	PRINTING STANDBY	1998-2-16 : 14 : 01 : 30	00020
3	TRIAL	TRIAL PRINT INDICATION	2	B	0033	WORD-PROCESSED	PRINTING STANDBY	1998-2-16 : 14 : 01 : 35	00025
4	TRIAL	NORMAL		A	1200	WORD-PROCESSED	PRINTING STANDBY	1998-2-16 : 14 : 02 : 30	00030
5	ORDINARY			B	0034	SPREADSHEET	PRINTING STANDBY	1998-2-16 : 14 : 03 : 01	00035
6	TRIAL	NORMAL		A	1250	WORD-PROCESSED	PRINTING STANDBY	1998-2-16 : 14 : 03 : 30	00040
7	TRIAL	TRIAL PRINT INDICATION	2	A	1260	SPREADSHEET	PRINTING STANDBY	1998-2-16 : 14 : 05 : 30	00045
:	:	:	:	:	:	:	:	:	:

41

FIG. 5

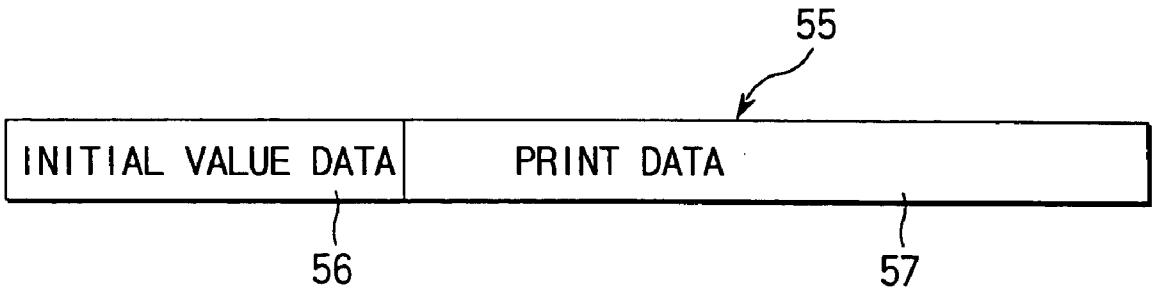

55
INITIAL VALUE DATA
PRINT DATA
56
57

FIG. 6

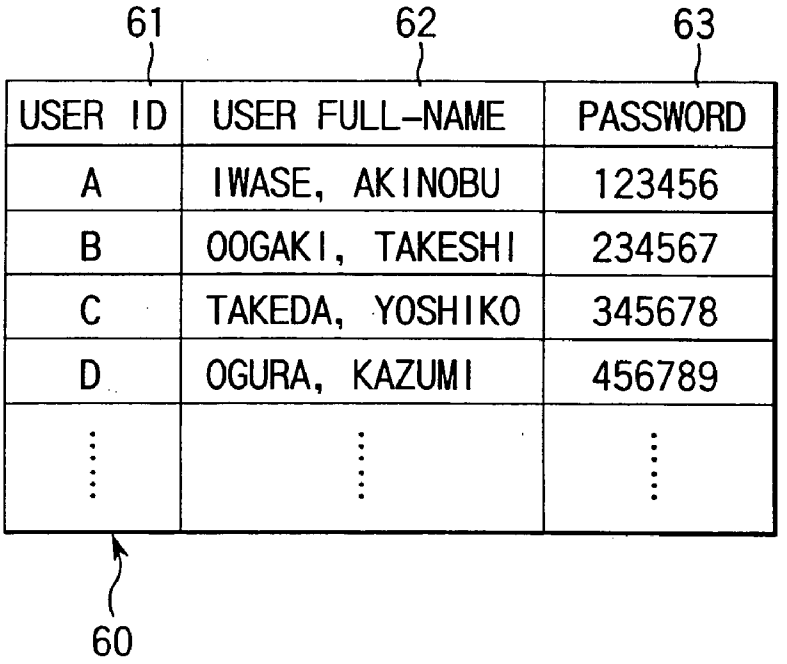

61
62
63
USER ID
USER FULL-NAME
PASSWORD
A
IWASE, AKINOBU
123456
B
OOGAKI, TAKESHI
234567
C
TAKEDA, YOSHIKO
345678
D
OGURA, KAZUMI
456789
60

FIG. 7

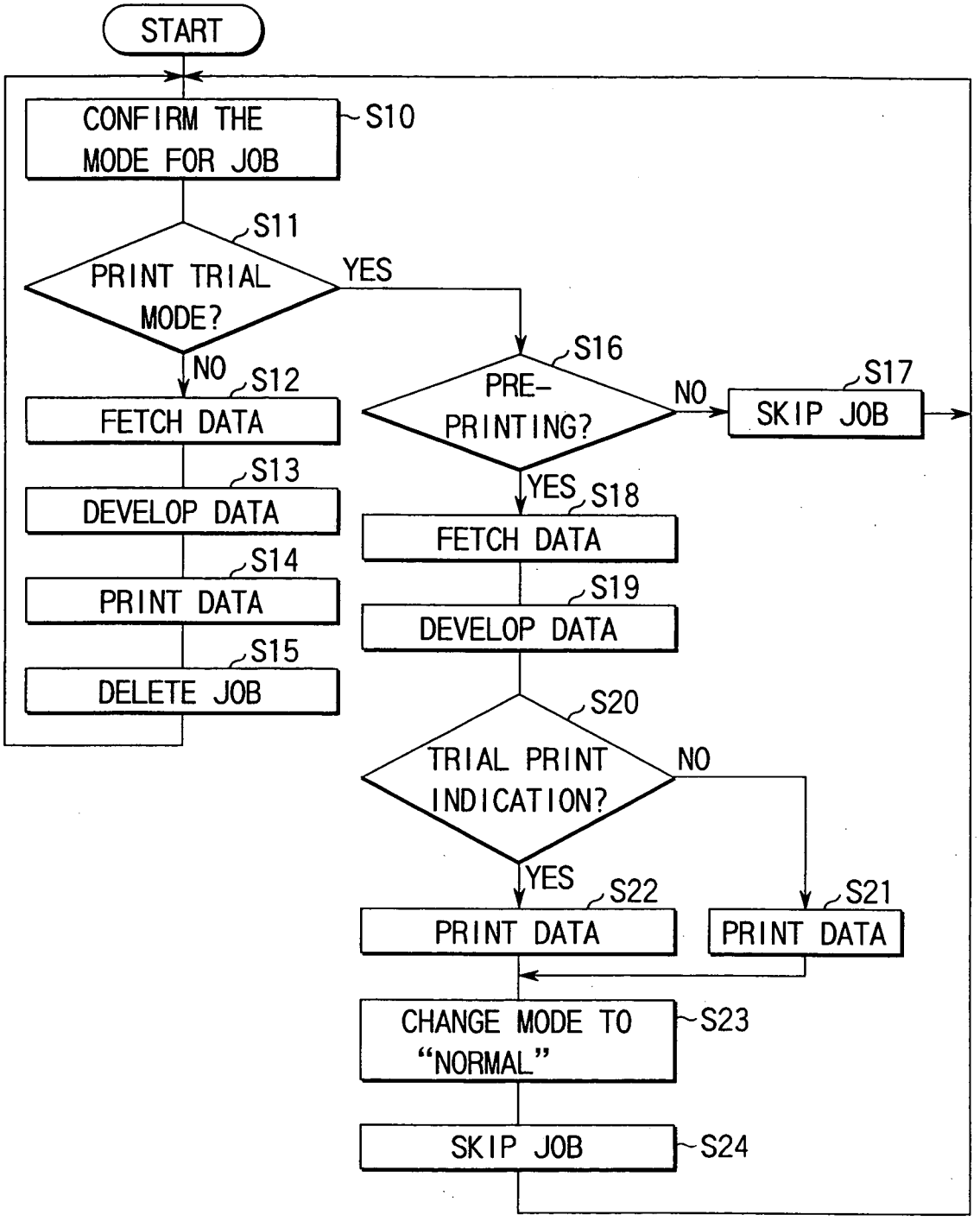

START
CONFIRM THE MODE FOR JOB
S10
S11
PRINT TRIAL MODE?
YES
NO
S12
FETCH DATA
S13
DEVELOP DATA
S14
PRINT DATA
S15
DELETE JOB
S16
PRE-PRINTING?
NO
S17
SKIP JOB
YES
S18
FETCH DATA
S19
DEVELOP DATA
S20
TRIAL PRINT INDICATION?
NO
YES
S22
PRINT DATA
S21
PRINT DATA
CHANGE MODE TO "NORMAL"
S23
SKIP JOB
S24

FIG. 8

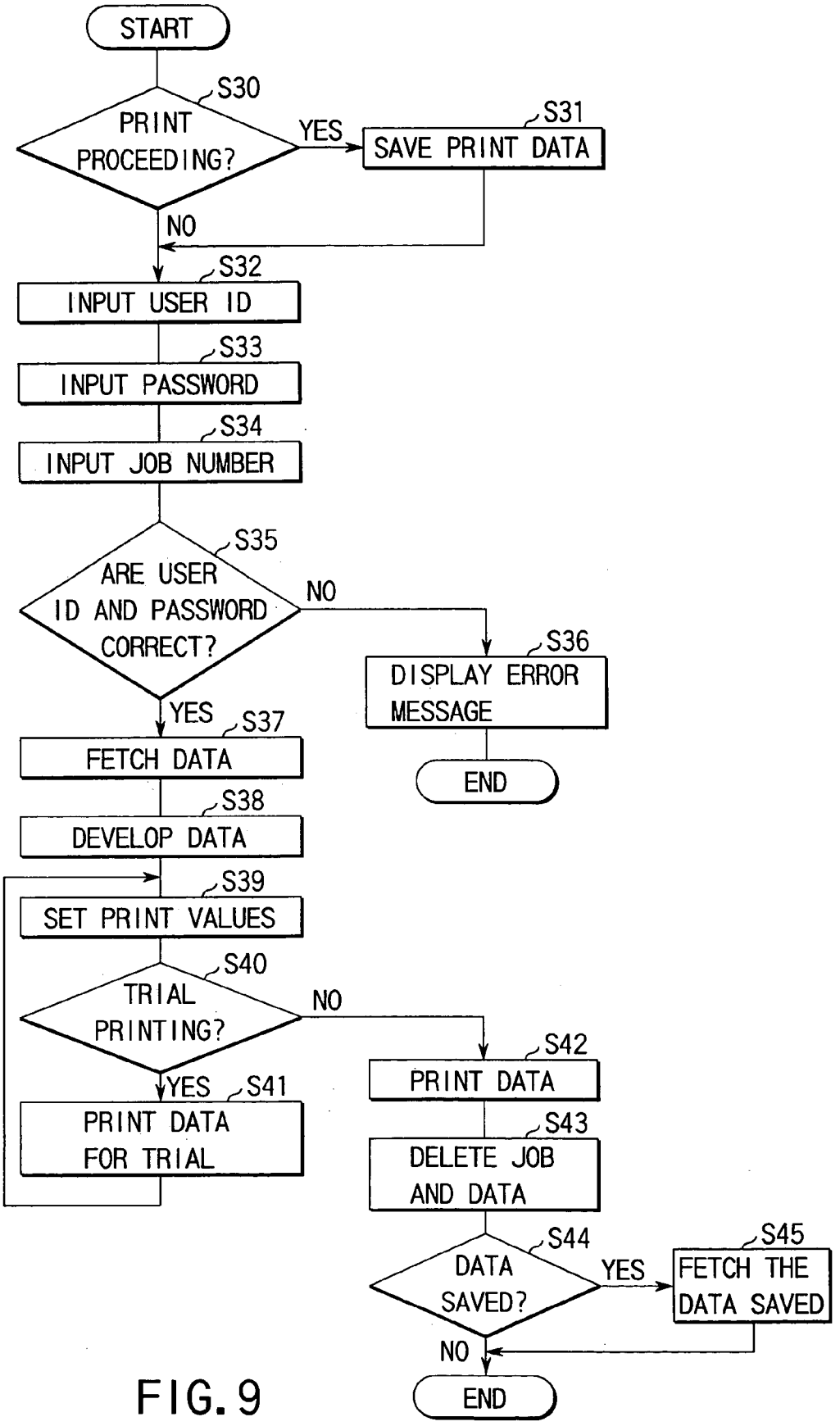

START
S30
PRINT PROCEEDING?
YES
S31
SAVE PRINT DATA
NO
S32
INPUT USER ID
S33
INPUT PASSWORD
S34
INPUT JOB NUMBER
S35
ARE USER ID AND PASSWORD CORRECT?
NO
S36
DISPLAY ERROR MESSAGE
END
YES
S37
FETCH DATA
S38
DEVELOP DATA
S39
SET PRINT VALUES
S40
TRIAL PRINTING?
NO
S42
PRINT DATA
S43
DELETE JOB AND DATA
S44
DATA SAVED?
YES
S45
FETCH THE DATA SAVED
NO
END
YES
S41
PRINT DATA FOR TRIAL

FIG. 9

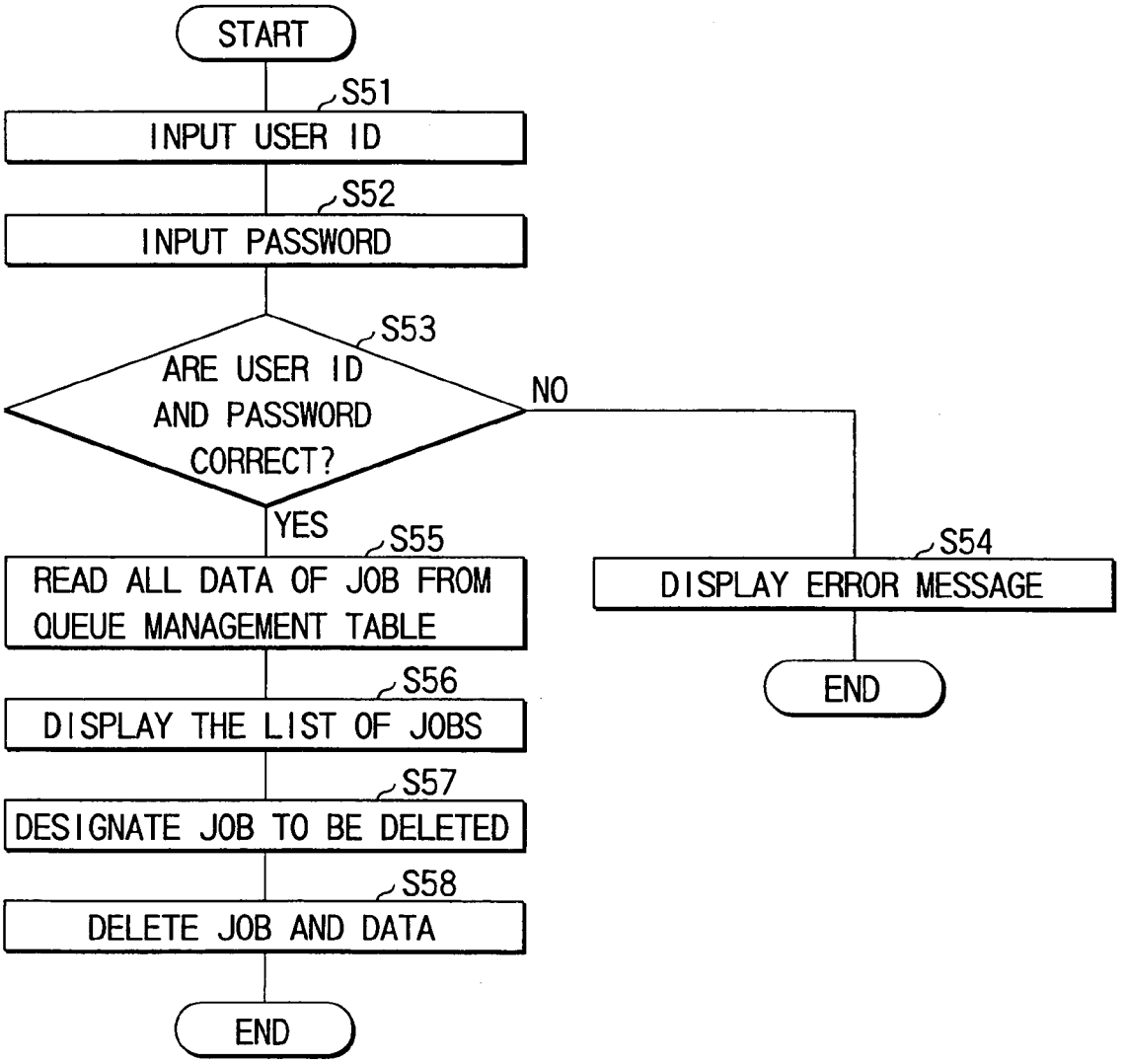

START
S51
INPUT USER ID
S52
INPUT PASSWORD
S53
ARE USER ID AND PASSWORD CORRECT?
NO
YES
S54
DISPLAY ERROR MESSAGE
END
S55
READ ALL DATA OF JOB FROM QUEUE MANAGEMENT TABLE
S56
DISPLAY THE LIST OF JOBS
S57
DESIGNATE JOB TO BE DELETED
S58
DELETE JOB AND DATA
END

FIG. 10

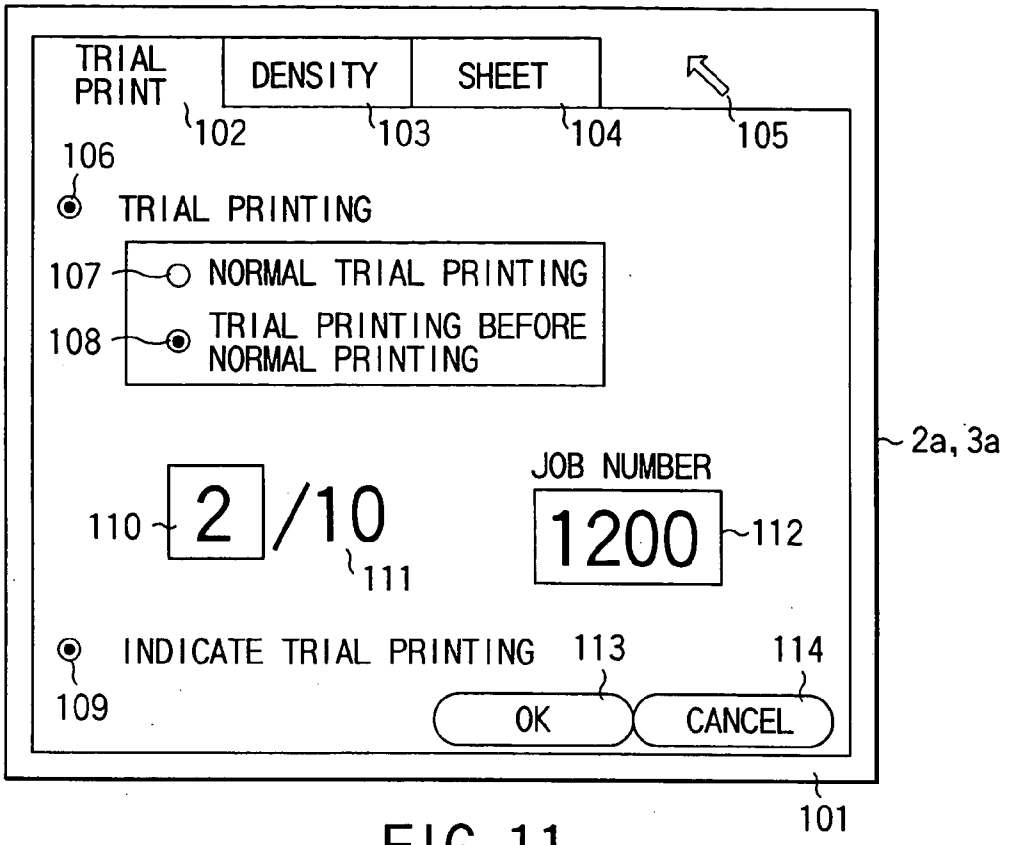

TRIAL PRINT
DENSITY
SHEET
102
103
104
105
106
TRIAL PRINTING
107
NORMAL TRIAL PRINTING
108
TRIAL PRINTING BEFORE NORMAL PRINTING
2a, 3a
JOB NUMBER
110
2
/10
111
1200
112
INDICATE TRIAL PRINTING
113
114
109
OK
CANCEL
101

FIG. 11

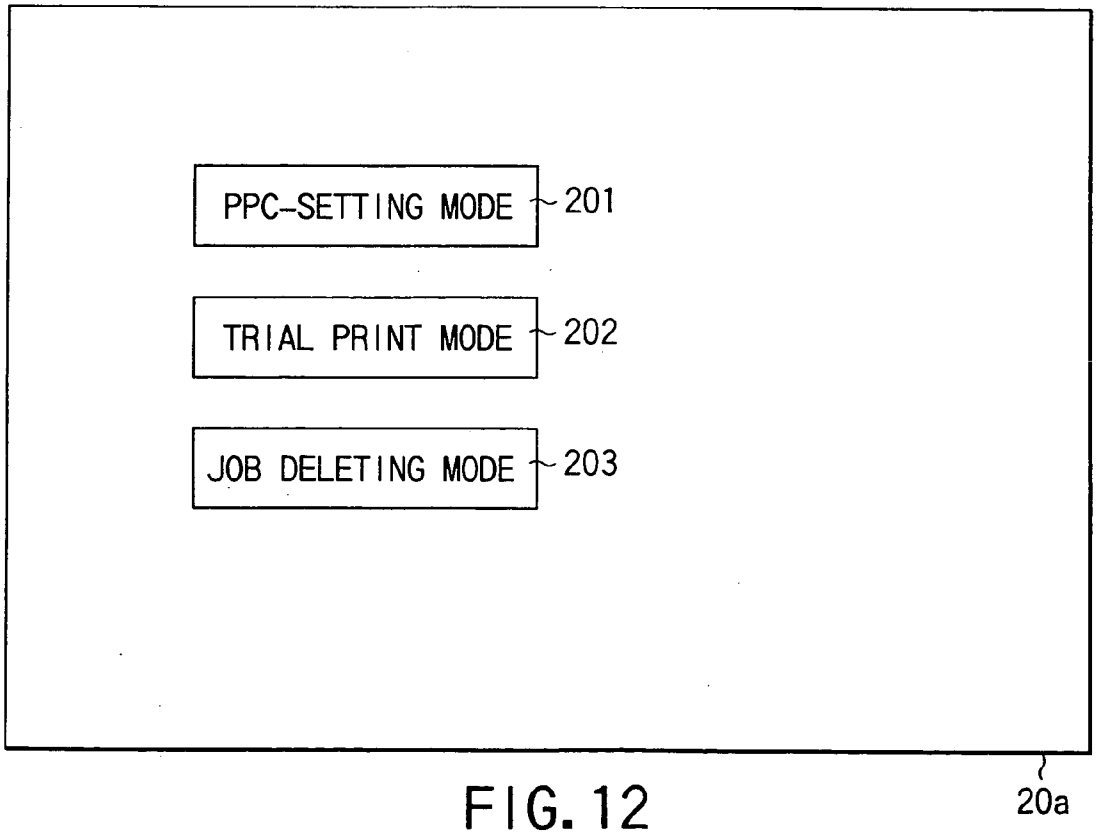

PPC-SETTING MODE
201
TRIAL PRINT MODE
202
JOB DELETING MODE
203
20a

FIG. 12

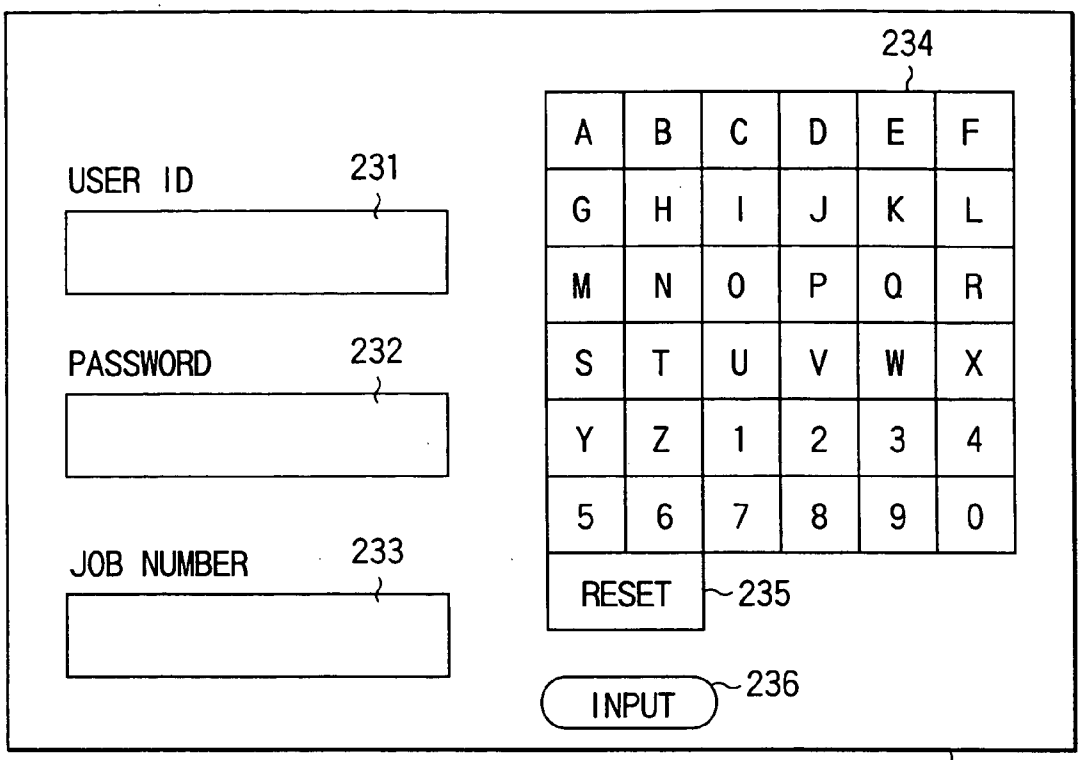

234
A B C D E F
G H I J K L
M N O P Q R
S T U V W X
Y Z 1 2 3 4
5 6 7 8 9 0
RESET
235
USER ID
231
PASSWORD
232
JOB NUMBER
233
INPUT
236
20a

FIG. 13

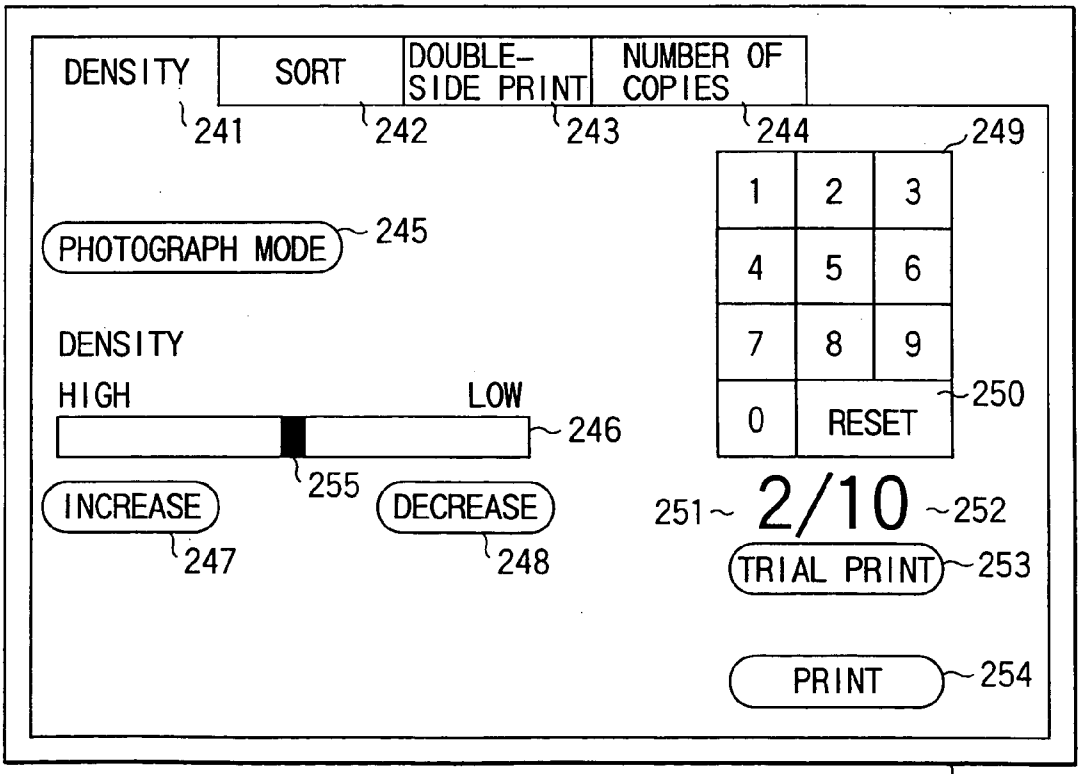

DENSITY
SORT
DOUBLE-SIDE PRINT
NUMBER OF COPIES
241
242
243
244
249
1 2 3
4 5 6
7 8 9
0 RESET
250
PHOTOGRAPH MODE
245
DENSITY
HIGH
LOW
246
255
INCREASE
247
DECREASE
248
251
2/10
252
TRIAL PRINT
253
PRINT
254
20a

FIG. 14

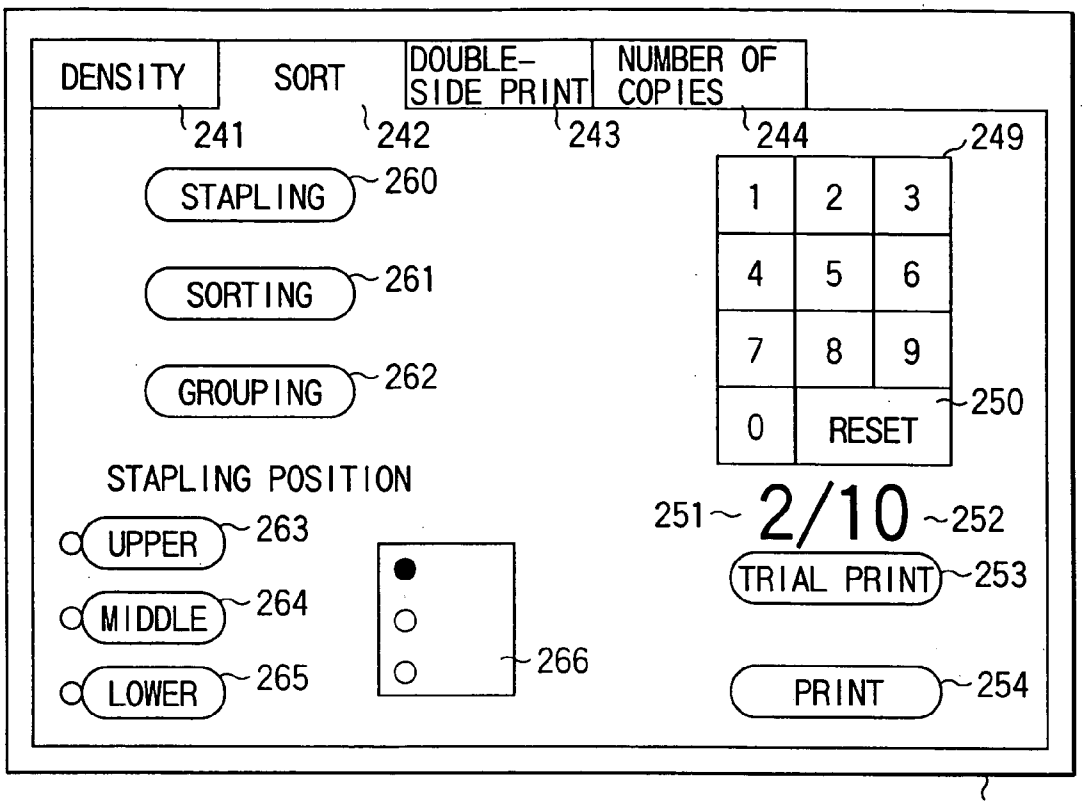

DENSITY
SORT
DOUBLE-SIDE PRINT
NUMBER OF COPIES
241
242
243
244
249
STAPLING
260
SORTING
261
GROUPING
262
1
2
3
4
5
6
7
8
9
0
RESET
250
STAPLING POSITION
UPPER
263
MIDDLE
264
LOWER
265
266
251
2/10
252
TRIAL PRINT
253
PRINT
254
20a

FIG. 15

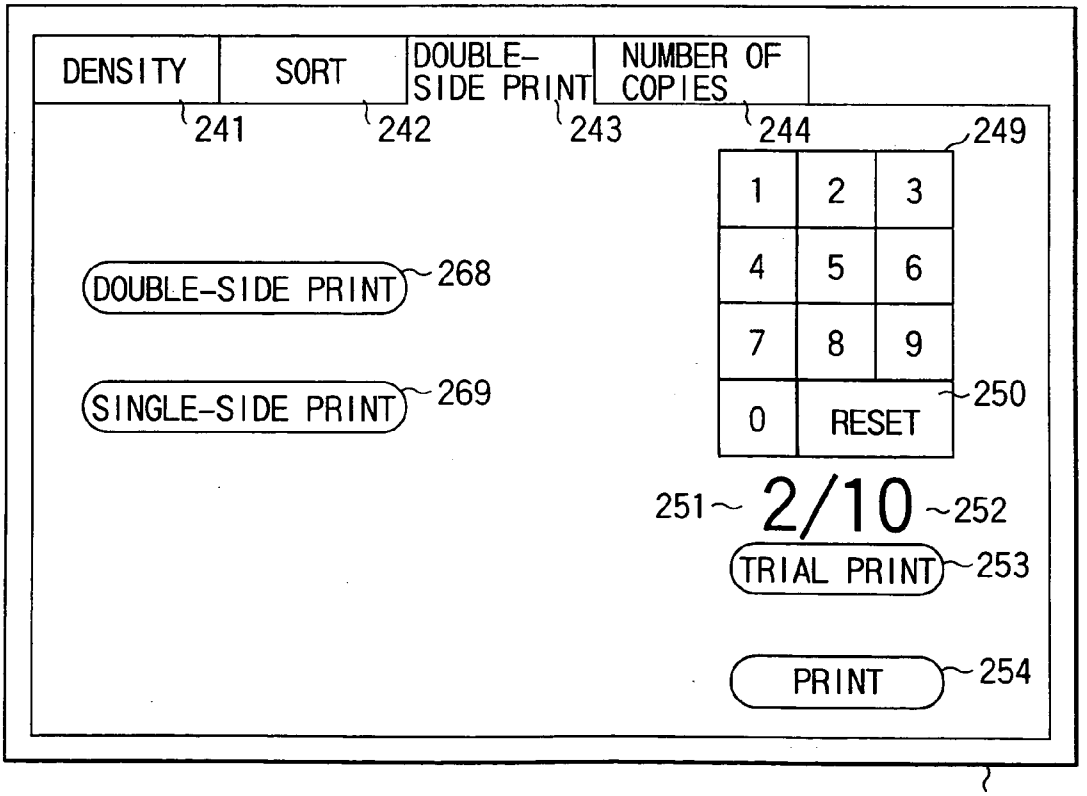

DENSITY
SORT
DOUBLE-SIDE PRINT
NUMBER OF COPIES
241
242
243
244
249
DOUBLE-SIDE PRINT
268
SINGLE-SIDE PRINT
269
1
2
3
4
5
6
7
8
9
0
RESET
250
251
2/10
252
TRIAL PRINT
253
PRINT
254
20a

FIG. 16

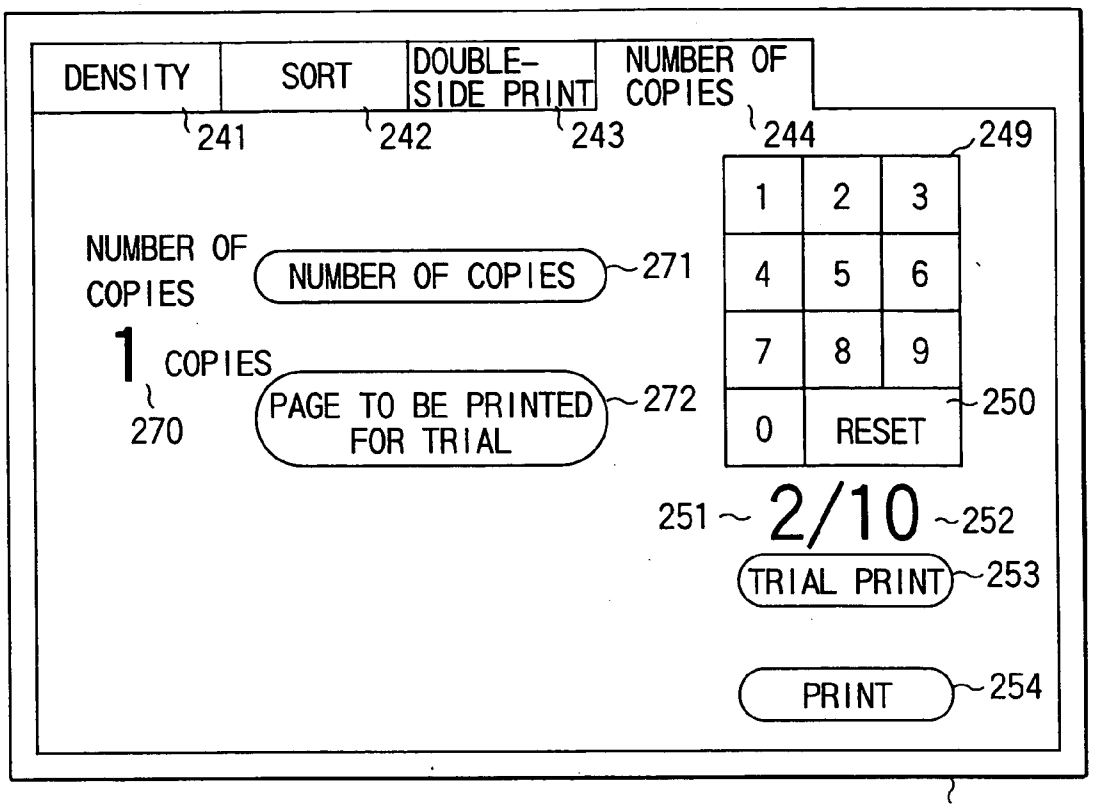

DENSITY
SORT
DOUBLE-SIDE PRINT
NUMBER OF COPIES
241
242
243
244
249
1 2 3
4 5 6
7 8 9
0 RESET
250
NUMBER OF COPIES
NUMBER OF COPIES
271
1 COPIES
270
PAGE TO BE PRINTED FOR TRIAL
272
251
2/10
252
TRIAL PRINT
253
PRINT
254
20a

FIG. 17

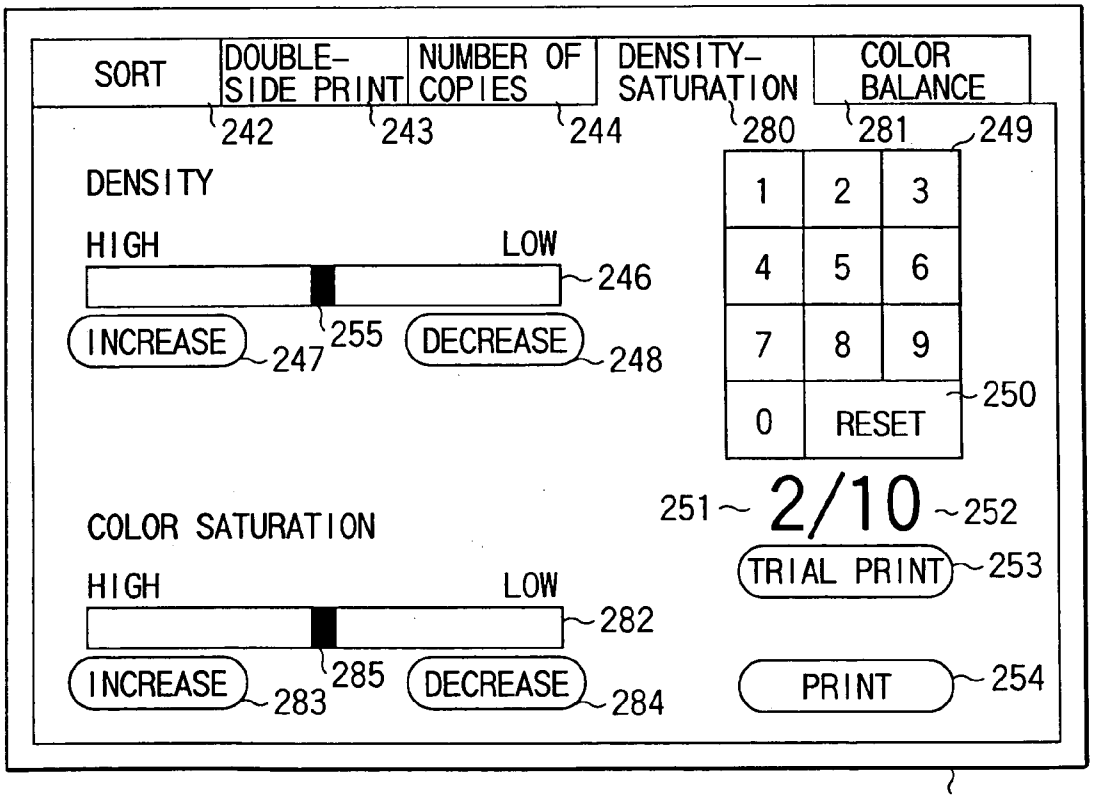

SORT
DOUBLE-SIDE PRINT
NUMBER OF COPIES
DENSITY-SATURATION
COLOR BALANCE
242
243
244
280
281
249
DENSITY
HIGH
LOW
246
INCREASE
247
255
DECREASE
248
1 2 3
4 5 6
7 8 9
0 RESET
250
251
2/10
252
COLOR SATURATION
HIGH
LOW
282
INCREASE
283
285
DECREASE
284
TRIAL PRINT
253
PRINT
254
20a

FIG. 18

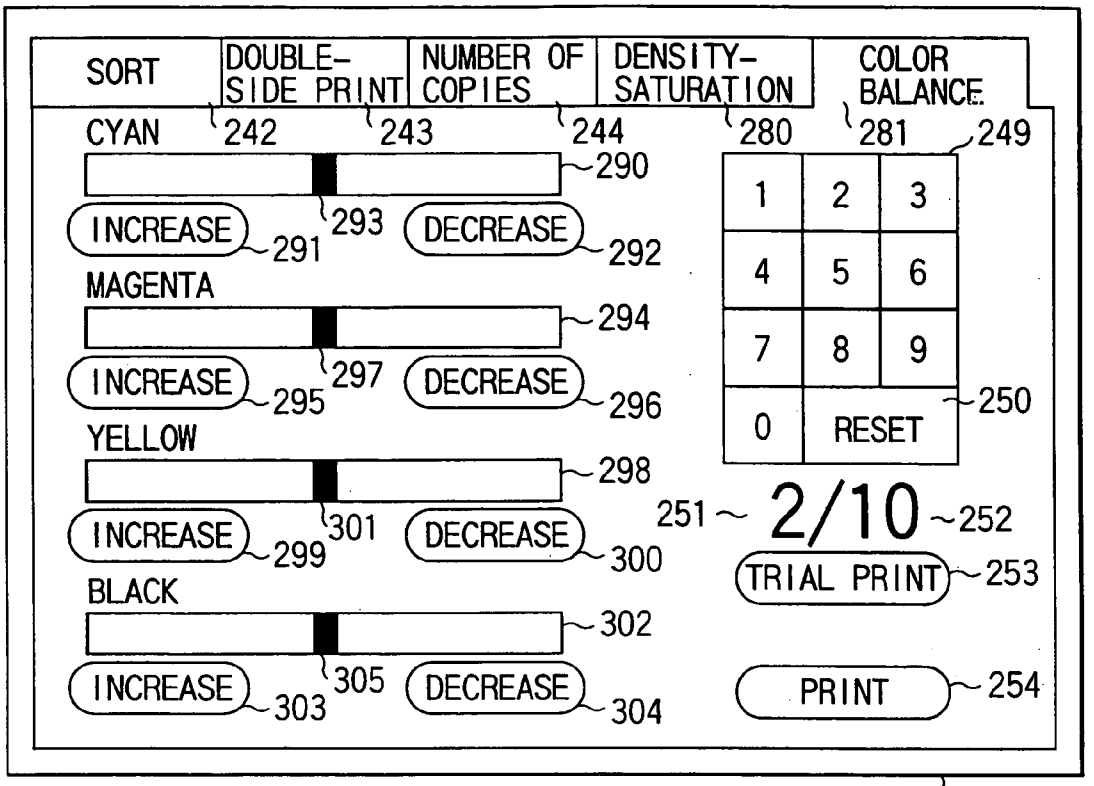

SORT
DOUBLE-SIDE PRINT
NUMBER OF COPIES
DENSITY-SATURATION
COLOR BALANCE
CYAN
242
243
244
280
281
249
290
INCREASE
291
293
DECREASE
292
MAGENTA
294
INCREASE
295
297
DECREASE
296
YELLOW
298
INCREASE
299
301
DECREASE
300
BLACK
302
INCREASE
303
305
DECREASE
304
1
2
3
4
5
6
7
8
9
0
RESET
250
251
2/10
252
TRIAL PRINT
253
PRINT
254
20a

FIG. 19

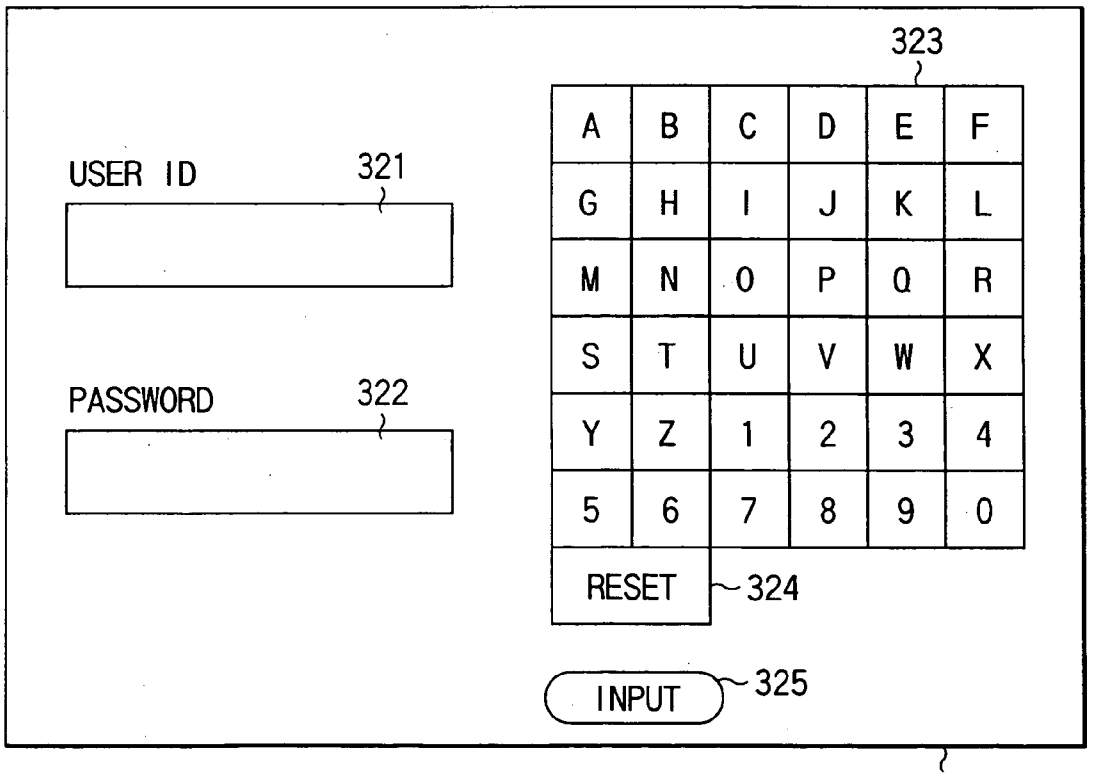

323
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
P
Q
R
S
T
U
V
W
X
Y
Z
1
2
3
4
5
6
7
8
9
0
RESET
324
USER ID
321
PASSWORD
322
INPUT
325
20a

FIG. 20

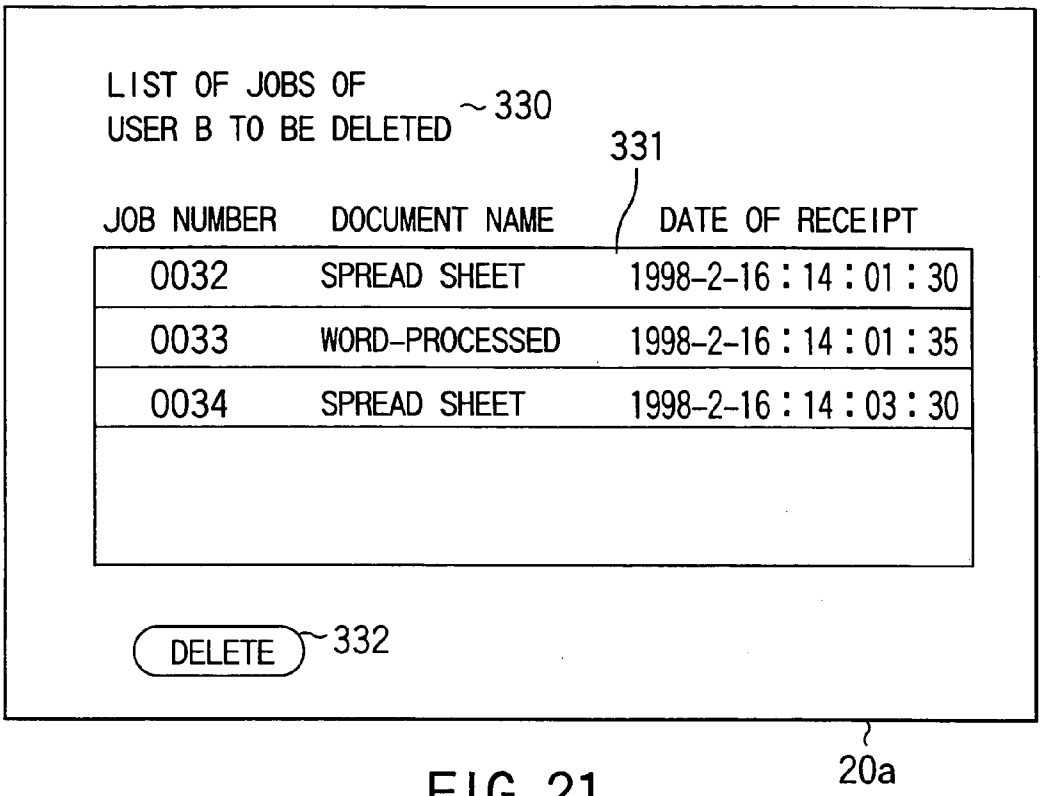


FIG. 21

340

350 PATH/FILE NAME	351 ISSUE DATE	352 DOCUMENT NAME	353 SET VALUE
C : /tmp/test1	1998-2-16 : 14 : 01 : 30	SPREAD SHEET	
C : /tmp/test2	1998-2-16 : 14 : 01 : 35	WORD-PROCESSED	
C : /tmp/test3	1998-2-16 : 14 : 03 : 30	SPREAD SHEET	
⋮	⋮	⋮	

FIG. 22

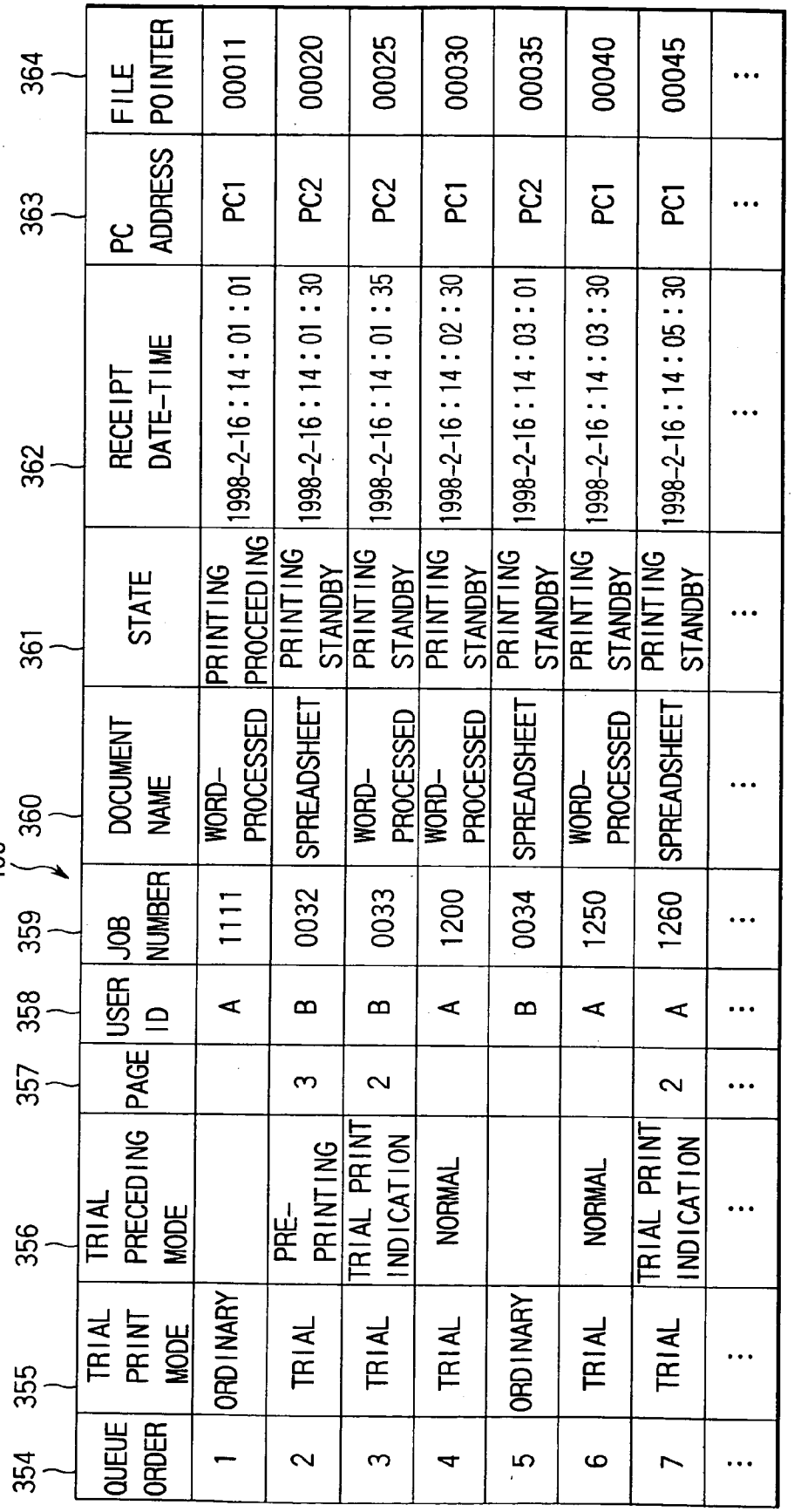

400
354
355
356
357
358
359
360
361
362
363
364
QUEUE ORDER
TRIAL PRINT MODE
TRIAL PRECEDING MODE
PAGE
USER ID
JOB NUMBER
DOCUMENT NAME
STATE
RECEIPT DATE-TIME
PC ADDRESS
FILE POINTER
1 ORDINARY A 1111 WORD-PROCESSED PRINTING PROCEEDING 1998-2-16:14:01:01 PC1 00011
2 TRIAL PRE-PRINTING 3 B 0032 SPREADSHEET PRINTING STANDBY 1998-2-16:14:01:30 PC2 00020
3 TRIAL TRIAL PRINT INDICATION 2 B 0033 WORD-PROCESSED PRINTING STANDBY 1998-2-16:14:01:35 PC2 00025
4 TRIAL NORMAL A 1200 WORD-PROCESSED PRINTING STANDBY 1998-2-16:14:02:30 PC1 00030
5 ORDINARY B 0034 SPREADSHEET PRINTING STANDBY 1998-2-16:14:03:01 PC2 00035
6 TRIAL NORMAL A 1250 WORD-PROCESSED PRINTING STANDBY 1998-2-16:14:03:30 PC1 00040
7 TRIAL TRIAL PRINT INDICATION 2 A 1260 SPREADSHEET PRINTING STANDBY 1998-2-16:14:05:30 PC1 00045

FIG. 23

IMAGE FORMING APPARATUS CAPABLE OF PERFORMING TRIAL PRINTING, AND IMAGE FORMING SYSTEM

BACKGROUND OF THE INVENTION

[0001] The present invention relates to a printing apparatus and a printing system, such as a shared printer and a digital printing system, which receive data from a plurality of clients though, for example, a local area network (LAN) or the like.

[0002] Recently, more and more office automation (OA) apparatuses have been connected to a LAN and used. Personal computers (PCs) and the like are also connected to a LAN, and data is exchanged between them. In many cases, a plurality of PCs share one printer, not each PC having one printer connected to it. Each PC may receive data from any other PC in the network and transmits it to the shared printer in the network, whereby the shared printer prints the data. Another PC called "server" is provided in the network to control data that is to be transmitted to the shared printer.

[0003] Upon receipt of pieces of print data from a plurality of PCs, the server stores them into a queue. The printer then prints pieces of data sequentially, in the order they have been input to the queue. Namely, the printer performs so-called "first in, first out" process.

[0004] Jpn. Pat. Appln. KOKAI Publication No. 10-11234 discloses the technique of storing data into a queue and processing, thereby to alter the setting of particular print data.

[0005] More specifically, one printer is connected two or more PCs by a LAN. The printer can therefore receive pieces of print data from the plurality of PCs. Thus, one printer is shared by a plurality of PC users. In addition, the printer and the PCs can be arranged more freely than otherwise. For example, each PC user can put the PC on his or her desk, while the shared printer can be installed at any place the PC users have agreed on.

[0006] A problem will arise, however, if the printer and the PC are arranged so. Some users may have their PCs located relatively near the printer, but some others inevitably have their PCs located far from the printer. The PC users of the latter group have to walk a long distance to take the printed sheets at the shared printer.

[0007] To make matters worse, the user may find that the printed sheets are of lower quality than he or she really wants. For example, the hatching over some printed characters in a word-processed document happens to be darker or lighter than is desired. In this case, the user needs to print the data again and, hence, must walk back to his or her PC. The user must reset the various print instructions on the PC, then push the print button, and walk again all the way to the shared printer to take the new printed sheets.

[0008] Thus, the user may need to spend much time to get desirable printed sheets if his PC is located far from the shared printer and if the sheets printed first by the printer are undesirable ones, compelling him or her to walk back to the PC and reset the print instructions on the PC.

[0009] As mentioned above, in a system comprising one printer and a plurality of PCs, each PC user needs to walk to the printer to get printed sheets unless the printer is installed just beside his or her PC. Moreover, if the printed sheets are of undesirable quality, the PC user must walk back to his or her PC to reset the print instructions and push the print button, and must walk again to the printer to take the sheet printed for the second time. As a consequence, the PC user cannot get desirable print sheets quickly.

BRIEF SUMMARY OF THE INVENTION

[0010] The object of the present invention is to provide a printing apparatus and a printing system, the system comprising at least one printing apparatus and a plurality of personal computers and which enables each user to reset print instructions at the printing apparatus to get printed sheets of the quality the user desires.

[0011] According to the invention there is provided an image forming apparatus which comprises: receiving means receiving a plurality of pages of image data transmitted through a communication line and receiving a partial print request signal requesting that only a part of the image data be printed; storage means for storing the image data and the partial print request signal, both received at the receiving means; and printing means for printing a part of the image data in response to the partial print request signal stored in the storage means.

[0012] The image forming apparatus, or the printer, prints at least a part of the image data, not all the image data transmitted an image data processing device through the communication line as in the conventional printing system.

[0013] The user examines the printed sheets and, if necessary, changes the print values by operating the control panel provided on the printer. Then, the user operates the control panel to have all image data printed at the printer.

[0014] Thus it can be prevented that all pages printed in accordance with print values all set at a personal computer turn out to have undesirable quality as may happen in the conventional printing system. That is, all pages can be printed only when the user checks at least one page printed for trial and then changes, if necessary, the print values to desired ones on the control panel of the printer. This helps the user to have sheets printed in the desired quality, with ease and reliability.

[0015] Therefore, the user need not repeatedly walk between his or her personal computer and the printer, to check the print quality and change the print values, as in the conventional printing system. Thus, the present invention provides a printing system that enables the user to get quickly printed sheets of desired quality.

[0016] Additional objects and advantages of the invention will be set forth in the description which follows, and in part will be obvious from the description, or may be learned by practice of the invention. The objects and advantages of the invention may be realized and obtained by means of the instrumentalities and combinations particularly pointed out hereinafter.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING

[0017] The accompanying drawings, which are incorporated in and constitute a part of the specification, illustrate presently preferred embodiments of the invention, and

together with the general description given above and the detailed description of the preferred embodiments given below, serve to explain the principles of the invention.

[0018] **FIG. 1** is a diagram schematically showing a printing system having a digital copier according to the present invention;

[0019] **FIG. 2** is a diagram schematically depicting the digital copier;

[0020] **FIG. 3** is a diagram illustrating an example of data to be transmitted from a personal computer to the digital copier;

[0021] **FIG. 4** is an image of a paper sheet printed for trial;

[0022] **FIG. 5** is a table showing an example of the queue management table provided in the digital copier;

[0023] **FIG. 6** is a diagram illustrating an example of data to be printed;

[0024] **FIG. 7** shows an example of a user management table;

[0025] **FIG. 8** is a flow chart explaining the ordinary printing that the digital copier performs;

[0026] **FIG. 9** is flow chart explaining the trial printing that the digital copier performs;

[0027] **FIG. 10** is a flow chart explaining the job deletion that the digital copier performs;

[0028] **FIG. 11** is a diagram showing an example of windows displayed on the digital copier;

[0029] **FIG. 12** is a diagram depicting a menu displayed on the display-input section of the control panel of the digital copier;

[0030] **FIG. 13** is a diagram showing another menu displayed on the display-input section of the control panel of the digital copier;

[0031] **FIG. 14** is a diagram showing still another menu displayed on the display-input section of the control panel of the digital copier;

[0032] **FIG. 15** is a diagram showing a different menu displayed on the display-input section of the control panel of the digital copier;

[0033] **FIG. 16** is a diagram showing a menu displayed on the display-display section of the control panel of the digital copier;

[0034] **FIG. 17** is a diagram showing a different menu displayed on the display-input section of the control panel of the digital copier;

[0035] **FIG. 18** is a diagram showing a menu displayed on the display-input section of the control panel of the digital copier;

[0036] **FIG. 19** is a diagram showing a still another menu displayed on the display-input section of the control panel of the digital copier;

[0037] **FIG. 20** is a diagram showing a different menu displayed on the display-input section of the control panel of the digital copier;

[0038] **FIG. 21** is a diagram showing another menu displayed on the display-input section of the control panel of the digital copier;

[0039] **FIG. 22** shows the driver management table incorporated in a personal computer; and

[0040] **FIG. 23** illustrates an example of the queue management table incorporated in the digital copier.

DETAILED DESCRIPTION OF THE INVENTION

[0041] Embodiments of the present invention will now be described, with reference to the accompanying drawings.

[0042] **FIG. 1** shows a printing system according to the invention. The system comprises a digital copier (PPC) **1**, a plurality of personal computers (PCs) **2** and **3**, and a local area network (LAN) **4**. The PPC **1** is used as a printer in the system. The LAN **4** connects PCs **2** and **3** to the PPC **1**. The PCs **2** and **3** are of the ordinary type. Each can transmit print data to the digital copier **1**. The digital copier **1** receives the print data from any PC and prints the data.

[0043] The PC **2** has a display section **2***a* and a keyboard **3***a*. Similarly, the PC **3** has a display section **3***a* and a keyboard **3***b*.

[0044] The first embodiment of the invention will be described below.

[0045] **FIG. 2** is a schematic representation of the digital copier **1**, which is the first embodiment of the present invention. As shown in **FIG. 2**, the digital copier **1** comprises a scanner section **11** and a printer section **12**. When the copier **1** is used as an ordinary copying apparatus, the scanner read an image signal from an original document, and the image signal is supplied to the printing section **12**. The printer section **12** prints the image represented by the image signal. The scanner section **11** has a CCD sensor (not shown). The CCD sensor converts the light reflected from the original document into an electric image signal. The printer section **12** is an electro-photographic device. It prints the image represented by the signal, on a sheet of paper. The printer section **12** may be replaced with an ink-jet printer.

[0046] The digital copier **1** further comprises a CPU (Central Processing Unit) **13**, a ROM **14** (Read Only Memory) **14**, a RAM (Random Access Memory) **15**, a hard desk drive (HDD) **16**, a network interface (I/F) **17**, a printer interface (I/F) **18**, a scanner interface (I/F) **19**, a control panel **20**, a control panel interface (I/F) **21**, a sorter **22**, a sorter control section **23**, and a sorter control interface (I/F) **24**. The CPU **13** controls the other components of the digital copier **1**. The ROM **14** stores operating software. The RAM **15** is provided to store temporarily image data and other data for operating the other components of the copier **1**. The HDD **16** is used to store various kinds of data. The network interface **17** transfers signals between the LAN **4** and the other components of the copier **1**. The printer interface **18** receives signals to and supplies signals to the printer section **12**. The scanner interface **19** receives signals to and supplies signals to the scanner section **11**. The control panel **20** receives various instructions and displays them when operated by a user. The control panel interface **21** receives signals to and supplies signals to the control panel **20**. The sorter **22** sorts printed paper sheets into bins so that the

sheets in the same bin may be stapled into a copy of document. The sorter control section **23** controls the sorter **22**. The sorter control interface **24** receives signals to and supplies signals to the sorter control section **23**.

[**0047**] The control panel **20** has a display-input section **20***a*. The display-input section **20***a* is designed to display and input data, as will be described later in greater detail.

[**0048**] The digital copier **1** has a bus **25**. The bus connects the CPU **13** to the ROM **14**, RAM **15**, HDD **16**, network interface **17**, printer interface **18**, scanner interface **19**, control panel interface **21** and sorter control interface **24**. Signals are transferred through the bus **25** between the components **13-19**, **21** and **24**.

[**0049**] **FIG. 3** illustrates the data, which is transmitted from the PC **2** in the LAN **4** to the digital copier **1** when the PC **2** gives a print request to the digital copier **1**. This data consists of a user ID field **31**, a job number field **32**, a document name field **33**, a trial print mode field **34**, a trial preceding mode field **35**, a page field **36**, an initial value field **37**, and a print data ID field **38**.

[**0050**] To use the PC **2**, the user performs log-in procedure, inputting the user data into the PC **2** to identify himself or herself. The user ID based on the user data is recorded in the user ID field **3**. The user ID is the code of the person who wishes to have data printed by the digital copier **1**. The PC **2** may give several print requests to the digital copier **1**. In this case, it is necessary to manage the print requests. To this end, serial numbers are assigned to the print requests. Each print request shall be called "job" hereinafter. The serial numbers are recorded in the job number field **32** and will be transmitted from the PC **2** to the digital copier **1**.

[**0051**] In the document name field **33**, the name of the job is recorded. The job name is assigned by the software used on the PC **2** to make the print request. The job name will be changed to one that depends on the software.

[**0052**] The fields that characterize the present invention are the trial print mode field **34**, the trial preceding mode field **35**, and the page field **36**.

[**0053**] In the trial print mode field **34**, either "normal" or "trial" is recorded. "Normal" indicates that normal printing has been designated. If the job is "normal," the digital copier **1** will print data in the same way as ordinary printers. If "trial" is recorded in the trial print mode field **34**, the printer section **12** will print data for trial. To effect trial printing, the job is set in the print queue **16***a* provided in the HDD **16**, whereby the data is printed for trial.

[**0054**] In the trial preceding mode field **35**, either "normal" or "pre-printing, trial print indication" is recorded. These values indicate the types of trial print modes. In the page field **36**, the page to be printed for trial is recorded if "trial" and "pre-printing, trial print indication" are recorded in the trail print mode filed **34** and the trial preceding mode field **35**, respectively. In this case, the page is set in the print queue **16***a* of the HDD **16**. If "normal" is recorded in the trail print mode filed **34**, the values recorded in the trial preceding mode field **35** and page field **36** will be neglected. If "trial" and "normal" are recorded in the trail print mode filed **34** and the trial preceding mode field **35**, respectively, the value recorded in the page field **36** will be neglected.

[**0055**] The trial print mode will be described in greater detail.

[**0056**] This print mode is classified into the following three sub-modes:

[**0057**] (1) Normal mode of trail printing

[**0058**] (2) Pre-print mode of trail printing

[**0059**] (3) Pre-print display mode of trial printing

[**0060**] These sub-modes will be explained below.

[**0061**] (1) To print data in the normal mode of trial printing, the user operates the PC **2**, setting this sub-mode. Then, the data shown in **FIG. 3** is transmitted to the digital copier **1**. In the digital copier **1**, the data is stored into the print queue **16***a* of the HDD **16**. The user cannot get the data printed, merely by storing it into the print queue **16***a*. To have the data printed, he or she has to walk to the digital copier **1** and operate the control panel **20** of the copier **1** to designate the page he or she wants to print.

[**0062**] The user examines the data printed for trial on paper sheets, to see whether the data has been printed in desired quality (i.e., the print density and the like). If the data has not been printed as he or she desires, the user operates the control panel **20** and gets the data printed for trial, repeatedly, until he or she obtains the data printed in the very quality he or she desires.

[**0063**] (2) To print data in the pre-print mode of trail print, the user operates the PC **2**, setting this sub-mode and designating the page he or she wants to have printed for trail. Then, the data shown in **FIG. 3** is transmitted to the digital copier **1**. In the digital copier **1**, the data is stored into the print queue **16***a* of the HDD **16**. When the job is assigned to the printing of the data in the print queue **16***a*, the digital copier **1** prints the designated page of the data. Thus, the job is performed while the user is walking to the copier **1**, and the user can examine the data printed no paper sheets upon arriving at the digital copier **1**. If the data has not been printed as desired, the user operates the control panel **20** and gets the data printed for trial, repeatedly, as in the normal mode of trial printing, until he or she obtains the data printed in the very quality he or she desires.

[**0064**] (3) In the pre-print display mode, the user operates the PC **2**, setting this sub-mode, whereby the digital copier **1** prints the designated page of the data while the user is walking to the copier **1**, as in the pre-print mode of trail print. In the pre-print display mode differs from the digital copier **1** in that a sentence **7** is automatically printed at the head of each paper sheet **6** as is illustrated in **FIG. 4**, indicating that the sheet is a trial print. The sentence **7** may be replaced with a mark and may be printed at any part of the paper sheet **6**. The sentence **7** may be replaced with the user ID, the user name, the job number, the document name, or the like. If this is case, it will be easy for the user to identify the job for which the trial printing has been made.

[**0065**] Management of print jobs and processing thereof will be described in detail.

[**0066**] When the digital copier **1** receives from the PC **2** a print request which includes the data shown in **FIG. 3**, the data is stored into the print queue **16***a* provided in the HDD **16**. **FIG. 5** shows an example of the queue management table **41** stored in the print queue **16***a*. Instead, the queue

management table **41** may be stored in the RAM **15** if it is small and the RAM **15** has a large storage capacity.

[**0067**] The queue management table **41** shown in **FIG. 5** consists of a queue order field **42**, a trial print mode field **43**, a trial preceding mode field **44**, a page field **45**, a user ID field **46**, a job number field **47**, a document name field **48**, a state field **49**, a receipt date-time field **50**, and a file pointer field **51**.

[**0068**] When received at the digital copier **1**, the data shown in **FIG. 3** is stored into the queue management table **41**. In the queue order field **42**, the numbers of jobs are stored in the order the jobs are to be executed. Thus, the job of number "1" will be executed first. In the trial print mode field **43**, the value recorded in trial print mode field **34** is recorded. In the trial preceding mode field **44**, the value recorded in the trial preceding mode field **35** (**FIG. 3**) is recorded. In the page field **45**, the value recorded in the page field **36** (**FIG. 3**) is recorded. In the user ID field **46**, the value recorded in the page field **36** (**FIG. 3**) is recorded. In the job number field **47**, the value recorded in the job number field **32** (**FIG. 3**) is recorded.

[**0069**] In the document name field **48**, the value recorded in the document name field **33** (**FIG. 3**) is recorded. In the state field **49**, the value showing the state of the job is recorded. More precisely, either "printing proceeding" or "printing standby" is stored in the state field **49**. In the receipt date-time field **50**, the date of receiving the data of the job is stored. In the file pointer field **51**, pointer data for the file, which contains the values recorded in the initial value field **37** and print data ID field **38**, respectively, is stored.

[**0070**] In the present embodiment, the values recorded in the initial value field **37** and print data ID field **38**, both shown in **FIG. 3**, are combined into one file **55**, and the name of this file **55** is stored into the file pointer field **51** shown in **FIG. 5**. **FIG. 6** is a schematic representation of this file **55**. The file **55** consists of initial value data **56** and print data **57** and is stored in the HDD **16** incorporated in the digital copier **1**.

[**0071**] As indicated above, any specified job recorded in the queue management table **41**, such as trial printing, can be carried out in the digital copier **1** by operating the control panel **20**. To enhance the security of the print data, the HDD **16** stores a password table in which user IDs and passwords for the user IDs are recorded.

[**0072**] **FIG. 7** shows the password table **60**. The password table **60** is composed of a user ID field **61**, a user full-name field **62**, and a password field **63**. In the user ID field **61**, user IDs are stored. In the user full-name field **62**, the full names of the users assigned with the user IDs are stored. In the password field **63**, the passwords assigned to the users are stored. Since the full names of the users and the like are difficult to input at the control panel **20** of the digital copier **1**, the password table **60** is prepared as a file in the PC and transmitted to the digital copier **1** by using file transfer protocol. The password table **60** is thereby stored into the HDD **16** of the digital copier **1**.

[**0073**] The operation of the digital copier **1** will now be described. Many tasks are performed in the digital copier **1**. Of these tasks, the printing routine, the trial printing routine and the job-deleting routine will be explained in detail.

[**0074**] **FIG. 8** is a flow chart explaining the printing routine. First, the job having the smallest serial number is read from the queue order field **42** of the queue management table **41**, and the mode for the job, which is recorded in the trial print mode field **43** of the table **41**, is confirmed (Step **S10**). Then, it is determined whether the mode recorded in the trial print mode field **43** is the trial print mode (Step **S11**).

[**0075**] If the mode recorded in the trial print mode field **43** is "normal," not "trial," the name of the file, in which the ID and initial value of the print data are recorded, is fetched from the file pointer field **51** (Step **S12**). The print data is developed into image data in the RAM **15** so as to be printed (Step **S13**). The image data is supplied via the printer interface **18** to the printer section **12**, which prints the image data on paper sheets (Step **S14**). Upon completion of the printing at the printer section **12**, the file in which the ID and initial value of the print data are recorded is deleted, and the job is deleted from the queue management table **41** (Step **S15**). Thereafter, the operation returns to Step **S10**. In Step **S10**, the job having the second smallest serial number is read from the queue order field **42**, and the mode for this job is confirmed.

[**0076**] If it is determined in Step **S11** that the mode recorded in the trial print mode field **43** is "trial," the trial preceding mode field **44** of the queue management table **41** is checked to see if the mode is "pre-printing" or "trial print indication" (Step **S16**). If the mode is "normal," not "pre-printing" or "trial print indication," the job is skipped (Step **S17**), and the operation returns to Step **S10**. In Step **S10**, the job having the third smallest serial number is read from the queue order field **42**, and the mode for the job is confirmed.

[**0077**] If it is determined in Step **S16** that the mode is either "pre-printing" or "trial print indication," the name of the file in which the ID and initial value of the print data are recorded is fetched from the file pointer field **51** (Step **S18**). The print data is developed into image data in the RAM **15** so as to be printed (Step **S19**). Next, it is determined whether the value recorded in the trial preceding mode field **44** is "trial" or not (Step **S20**).

[**0078**] If the value in the trial preceding mode field **44** is either "pre-printing" or "trial print indication," the image data of the page designated by the value recorded in the page field **45** is supplied via the printer interface **18** to the printer section **12**. The printer section **12** prints this image data for trial on paper sheets (Step **S21**). If the value in the trial preceding mode field **44** is "trial," the image data of the page designated by the value recorded in the page field **45** is developed in the RAM **15**, and a mark indicating that the data is printed for trial is added to the image data. The image data containing the mark is supplied via the printer interface **18** to the printer section **12**, which prints this image data for trial on paper sheets (Step **S22**).

[**0079**] The operation goes to Step **S23**, in which the value in the trial preceding mode field **44**, which is "pre-printing" or "trial print indication," is changed to "normal." The job is skipped (Step **S24**), and the operation returns to Step **S10**. In Step **S10**, the job having the fourth smallest serial number is read from the queue order field **42**, and the mode for the job is confirmed.

[**0080**] **FIG. 9** is a flow chart explaining the trial printing routine. The trial printing routine is started when the user

walks to the digital copier **1** and operates the display-input section **20***a* of the control panel **20**, thereby selecting the trial print mode.

[**0081**] First, it is determined whether or not the printer section **12** of the digital copier **1** is printing a job (Step S**30**). If the section **12** is printing a job, the print data of the job is saved temporarily so that it may be printed later (Step S**31**). To be more specific, the various values set, print data and the number of pages already printed are stored, in the form of a file, into the HDD **16** of the digital copier **1**.

[**0082**] Next, the user operates the display-input section **20***a* of the control panel **20**, inputting his or her user ID (Step S**32**). The user then operates the display-input section **20***a*, inputting his or her password (Step S**33**). The user further operates the display-input section **20***a*, inputting the number of the job he or she wants to print for trial (Step S**34**). The queue management table **41** and the password table **60** are checked to determine whether the user ID and the password, thus input, are correct ones (Step S**35**). If the user ID or the password, or both are not correct, this fact will be indicated on the display-input section **20***a* of the control panel **20** (Step S**36**). Thus ends the trial printing routine.

[**0083**] If it is determined in Step S**35** that the user ID and the password are correct, the name of the file, in which the ID and initial value of the print data are recorded, is fetched from the file pointer field **51** (Step S**37**). The print data is developed into image data in the RAM **15** so as to be printed (Step S**38**).

[**0084**] Then, the user operates the display-input section **20***a*, setting various print values (Step S**39**). These print values are print density, sorting mode, stable mode, stapling position, double-side print, number of copies, and the like. To print color images, additional print values, such as color saturation, color balance, and the like, must be input. Also in Step S**39**, the page of data to be printed for trial can be designated.

[**0085**] Next, it is determined whether or not the trial printing has been designated, or whether a trial printing button displayed on the display-input section **20***a* has been selected (Step S**40**). If YES, that is, if the trial print button has been selected, the image data of the pages, which are designated by the values set in Step S**39** and which are to be printed, is supplied through the printer interface **18** to the printer section **12**. The printer section **12** prints only the designated page of image data for trial on paper sheets (Step S**41**). Then, the operation returns to Step S**39**. After examining the quality of the image printed for trial, the user can set, if necessary, different print values to have the same image data printed in more desirable quality.

[**0086**] If NO in Step S**40**, that is, if the print button displayed on the display-input section **20***a* has been selected, all pages of image data are supplied via the printer interface **18** to the printer section **12**. The printer section **12** prints all pages of image data on paper sheets in accordance of the print values set in Step S**39** (Step S**42**).

[**0087**] Upon completion of the printing at the printer section **12**, the file in which the ID and initial value of the print data are recorded is deleted, and the job is deleted from the queue management table **41** (Step S**43**). It is then determined whether data has been saved in Step S**31** in any file (Step S**44**). If there is data saved, the data is fetched from the file, and the job interrupted at the start of the trial printing routine is resumed (Step S**45**). Thus, the trial printing routine does end.

[**0088**] The job-deleting routine will be described, with reference to the flow chart of **FIG. 10**. This routine is initiated when the user comes to the digital copier **1** and operates the display-input section **20***a* of the control panel **20**, thereby selecting the job-deleting mode.

[**0089**] First, the user operates the display-input section **20***a*, inputting his or her user ID (Step S**51**). The user then operates the display-input section **20***a*, thereby inputting his or her password (Step S**52**). It is then determined whether the user ID and the password are correct or not (Step S**53**). If the user ID and the password are not correct, this fact is displayed on the display-input section **20***a* of the control panel **20** (Step S**54**). The job-deleting routine ends.

[**0090**] If it is determined in Step S**53** that the user ID and the password are correct, all data of the job is read from the queue management table **41** (Step S**55**). The job data is displayed in the form of a table on the display-input section **20***a* of the control panel **20** (Step S**56**). Seeing the job data displayed, the user operates the display-input section **20***a* designating the job to be deleted (Step S**57**). Then, the file containing the initial value and print data of the job and the job itself are deleted from the queue management table **41** (Step S**58**). Thus ends the job-deleting routine.

[**0091**] **FIG. 11** shows a window **101** which is displayed on the display section **2***a* of the PC **2**, which is used to set the trial print mode on the PC **2**.

[**0092**] This window **101** is displayed to set print values for the digital copier **1**, while the PC **2** is using software. Hence, the window **101** is displayed by the use of the driver software installed in the PC **2** for driving the digital copier **1**.

[**0093**] Shown in the window **101** are a trial print tab **102**, a density-adjusting tab **103**, and a sheet-selecting tab **104**. The trial print tab **102** is used to designate trial printing. The density-adjusting tab **103** is used to adjust the print density. The sheet-selecting tab **104** is used to select sheets of a desired size. One of these tabs **102**, **103** and **104** is selected by moving a pointer **105** to the tab and clicking a mouse (not shown).

[**0094**] If the trial print tab **102** is selected to make the digital copier **1** print data for trial, check buttons **106** to **109**, page input area **110**, all-page area **111**, job number area **112**, OK button **113**, and cancel button **114** will be displayed in the window **110**. The check button **106** is selected to designate trial printing, a check button **107** to designate the normal mode of trail printing, a check button **108** to designate the pre-print mode of trial printing, and a check button **109** to designate pre-print display mode of trial printing. The page of data to be printed for trial is displayed in the page input area **110**. The number of all pages to be printed is displayed in all-page area **111**. The number of the job is displayed in the job number area **112**.

[**0095**] In order to print the data for trial, the user moves the pointer **105** to the check button **106** and clicks the mouse, thus setting the digital copier **1** in the trial print mode. Unless or until the check button **106** is thus activated, the other check buttons **107**, **108** and **109** and the areas **110** and **112** remain invalid.

[0096] While the check button **106** is active, only one of the check buttons **107** and **108** can be activated. If the check button **107** is activated, the pre-print mode of trail printing cannot be set, the area **110** cannot be selected, and the check button **109** cannot be activated.

[0097] If the check button **108** is activated, the trial printing precedes the normal printing. In this case, the area **110** can be selected and the check button **109** can be activated. While the check button **10** remains active, the user may operates the keyboard **3***a* of the PC **2**, inputting the page he or she wishes to get printed for trial and displaying the page in the area **110**. If so, the number of all pages of the document is displayed in the area **111**. Any one of the pages displayed in the area **111** can be designated and printed for trial.

[0098] While the check button **108** remains active, the check button **109** can be activated to designate the printing of a mark indicating that the data is printed for trial, as illustrated in **FIG. 4**, along with the image data printed in the pre-print display mode of trial printing. Unless the check button **108** is activated, the mark cannot be printed.

[0099] Every time the digital copier **1** receives a print job, it issues a serial number for the job to the PC **2**. This serial number is displayed in the job number area **112**. The serial number is a decimal four-digit number, which is easy to learn. When the digital copier **1** receives a print job after the serial number has reached "9999," the serial number will change to "0001."

[0100] The OK button **113** is selected by clicking the mouse while the pointer **105** is pointing this button **113**, after all values have been set for trail printing as described above. The cancel button **114** is selected by clicking the mouse while the pointer **105** is pointing the button **114**, thereby to cancel all values that have been set for trial printing.

[0101] Various menus, which the display-input section **20***a* of the control panel **20** provided on the digital copier **1** can display, will now be described.

[0102] **FIG. 12** depicts the initial menu displayed on the display-input section **20***a*. That is, a PPC-setting button **201**, a trail printing button **202**, and a job-deleting button **203** are displayed on the display-input section **20***a* when the power switch of the digital copier **1** is turned on. The PPC-setting button **201** is touched to use the copier **1** as an ordinary one and set various print instructions. The print instructions are set in the known manner and will not be described. The job-deleting button **203** is touched to delete the job from the queue management table **41**.

[0103] The trial printing button **202** will be described. After designating the trial printing by selecting the buttons displayed on the display section **2***a* and by operating the key board **3***a*, the user comes to the digital copier **1**. The user touches the trial printing button **202** displayed on the display-input section **20***a*. As a result, the display-input section **20***a* displays the menu shown in **FIG. 13**.

[0104] As shown in **FIG. 13**, this menu consists of a user ID area **231**, a password area **232**, a job number area **233**, a character key pad **234**, a reset button **235**, and an input button **236**.

[0105] First, the user inputs his or her user ID in the area **231**, by touching the selected keys of the character keypad **234**. If the user makes a wrong user ID, he or she touches the reset button **235**, thereby clearing the wrong user ID. After inputting the user ID in the area **231**, the user touches the input button **236**. Then, the user touches the selected keys of the character key pad **234**, thereby inputting his or her password. The password is not displayed in the password area **232**. Rather, a prescribed number asterisks (*) or underline bars (_) are displayed in the password area **232**. After inputting password, the user touches the input button **236**. Then, the user touches the selected keys of the character key pad **234**, inputting the job number in the job number area **233**. Finally, the user touches the input button **236**. If the user has input a wrong job number, an error message will be displayed, and he or she can perform no further operations.

[0106] If the user has input a correct job number, the menu will change to the new one shown in **FIG. 14**. As shown in **FIG. 14**, the new menu consists of a density tab **241**, a sort tab **242**, a double-side print tab **243**, and a copy number tab **244**. While each of these tabs remains selected, the value for the tab can be set. **FIG. 14** shows the case where the density tab **241** is selected. In this case, a photograph mode button **245**, a density scale **246**, a density-increasing button **247**, a density-decreasing button **248**, a ten-key pad **249**, a reset button **250**, a trial print page area **251**, a total page number area **252**, a trial print button **253**, and a print button **254** are displayed in the menu.

[0107] The user may touch the photograph mode button **245** to print a document in photograph mode. The button **245** is displayed in reverse mode as long as it remains active.

[0108] On the density scale **246**, a mark **255** indicates the density selected at present. The user may touch the density-increasing button **247** to shift the mark **255** toward the upper limit, thereby to increase the print density. Alternatively, the user may touch the density-decreasing button **248** to shift the mark **255** toward the lower limit, thereby to decrease the print density.

[0109] The ten-key pad **249** is provided for inputting a page number in the trial print page area **251** that is displayed below the ten-key pad **249**. The number displayed in the trial print page area **251** is cleared when the reset key **250** is touched.

[0110] In the total page number area **252**, the total page number of the document is displayed. The trial print button **253** is touched to print the page of the document, which is displayed in the trial print page area **251**. When the button **253** is touched, the menu as shown in **FIG. 14** does not change at all.

[0111] When the print button **254** is touched, all pages of the document are printed on paper sheets in accordance of the print values that have been set as described above. When the digital copier **1** finishes printing all pages of the document, the menu automatically changes back to the initial menu of **FIG. 12**.

[0112] If the user selects the sort tab **242**, the display-input section **20***a* will displays the menu shown in **FIG. 15**. This menu has a stable button **260**, a sort button **261**, a group button **262**, an upper staple position button **263**, a middle staple position button **264**, a lower staple position button **265**, a staple position area **266**, a ten-key pad **249**, a reset button **250**, a trial print page area **251**, a total page number area **252**, a trial print button **253**, and a print button **254**.

[0113] The user may touch the staple button **260** to staple printed sheets into a copy of document. While the button **260** remains active, it is displayed in reverse mode, enabling the user to activate the upper staple position button **263**, middle staple position button **264** and lower staple position button **265**. If the upper staple position button **263** is activated, the copied sheets will be stapled at the upper margin. If the middle staple position button **264** is activated, the copied sheets will be stapled at the middle margin. If the lower staple position button **265** is activated, the copied sheets will be stapled at the lower margin. Only one staple position button can be activated at a time. The staple position selected is schematically indicated in the staple position area **266**.

[0114] The user may touch the sort button **261** to sort copied paper sheets into bins. The group button **262** is touched to sort copied sheets, thereby to make groups. The sort button **261** and the group button **262** cannot be selected at the same time. The ten-key pad **249**, reset button **250**, trial print page area **251**, total page number area **252**, trial print button **253** and print button **254** are identical in function to those displayed in the menu of **FIG. 14**.

[0115] If the user selects the double-side print tab **243**, the display-input section **20***a* will displays the menu shown in **FIG. 16**. The menu has a double-side print button **268**, a single-side print button **269**, a ten-key pad **249**, a reset button **250**, a trial print page area **251**, a total page number area **252**, a trial print button **253**, and a print button **254**.

[0116] The user may touch the double-side print button **268** to print any two consecutive pages of data on the two side of a paper sheet, respectively. Alternatively, the user may touch the single-side print button **269** to print each page of data on one side of a paper sheet.

[0117] The ten-key pad **249**, reset button **250**, trial print page area **251**, total page number area **252**, trial print button **253** and print button **254** are identical in function to those displayed in the menu of **FIG. 14**.

[0118] If the user selects the copy number tab **244**, the display-input section **20***a* will displays the menu shown in **FIG. 17**. This menu has a copy number area **270**, a copy number button **271**, a trial print page button **272**, a ten-key pad **249**, a reset button **250**, a trial print page area **251**, a total page number area **252**, a trial print button **253**, and a print button **254**.

[0119] While this menu remains displayed on the display-input section **20***a*, the user can set a desired number of copies. Once the copy number setting button **271** has been activated, the user can operate the ten-key pad **249** and can activate the reset button **250** to set any desired number of trial copies. The desired number of trial copies, set by operating the ten-key pad **249**, is displayed in the copy number area **270**. The user then touches the trial print page button **272**, whereby he or she can operates the ten-key pad **249** and activate the reset button **250** to designate the page that should be printed for trial. As long as the trial print page button **272** remains active, the ten-key pad **249**, reset button **250**, trial print page area **251**, total page number area **252**, trial print button **253** and print button **254** function in the same way as those displayed in the menu of **FIG. 14**.

[0120] How the digital copier **1** operates while set in monochrome printing mode has been described above. Nonetheless, the digital copier can be set into color print mode. It will now be described how the copier **1** operates in the color-printing mode.

[0121] When the user sets the copier **1** into color print mode, the menu shown in **FIG. 18** is displayed on the display-input section **20***a*. The menu has a sort tab **242**, a double-side print tab **243**, a copy number tab **244**, a density-saturation tab **280**, and a color balance tab **281**.

[0122] The menu shown in **FIG. 18** is displayed while the density-saturation tab **280** remains selected. The menu further has a density scale **246**, a density-increasing button **247**, a density-decreasing button **248**, a color saturation scale **282**, a saturation-increasing button **283**, a saturation-decreasing button **284**, a ten-key pad **249**, a reset button **250**, a trial print page area **251**, a total page number area **252**, a trial print button **253**, and a print button **254**.

[0123] How the color saturation is set at a desired value will be explained below. The color saturation scale **282** has a mark **285** that indicates the color saturation set at present. The user may touch the saturation-increasing button **283** to shift the mark **285** toward the upper limit, thereby to increase the color saturation. Instead, the user may touch the saturation-decreasing button **284** to shift the mark **285** toward the lower limit, thereby to decrease the color saturation.

[0124] When the user touches the color balance tab **281** to adjust the color balance, the display-input section **20***a* displays the menu shown in **FIG. 19**. The menu of **FIG. 19** has a cyan density scale **290**, a cyan-density increasing button **291**, a cyan-density decreasing button **292**, a magenta density scale **294**, a magenta-density increasing button **295**, a magenta-density decreasing button **296**, a yellow density scale **298**, a yellow-density increasing scale **299**, a yellow-density decreasing scale **300**, a black density scale **302**, a black-density increasing button **303**, and a black-density decreasing button **304**. The menu further has a ten-key pad **249**, a reset button **250**, a trial print page area **251**, a total page number area **252**, a trial print button **253**, and a print button **254**.

[0125] To adjust the cyan density, the user touches the cyan-density increasing button **291** or the cyan-density decreasing button **292**, whereby a mark **293** moves on the cyan density scale **290**. To adjust the magenta density, the user touches the magenta-density increasing button **295** or the magenta-density decreasing button **296** to adjust the magenta density, whereby a mark **297** moves on) the magenta density scale **294**. In order to adjust the yellow density, the user touches the yellow-density increasing button **299** or the magenta-density decreasing button **300** to adjust the magenta density, whereby a mark **301** moves on the yellow density scale **298**. To adjust the black density, the user touches the yellow-density increasing button **299** or the magenta-density decreasing button **300** to adjust the magenta density, whereby a mark **301** moves on the yellow density scale **298**.

[0126] While the display-input section **20***a* is displaying the initial menu shown in **FIG. 12**, the user may touch the job-deleting button **203** in order to delete the job from the queue management table **41**.

[0127] In this case, the display-input section **20***a* displays the menu shown in **FIG. 20**, instead of the initial menu

(**FIG. 12**). The menu of **FIG. 20** has a user ID area **321**, a password area **322**, a character keypad **323**, a reset button **324**, and an input button **325**.

[**0128**] At first, the user inputs his or her user ID in the area **321**, by touching the selected keys of the character keypad **323**. If the user makes a wrong user ID, he or she touches the reset button **324**, thereby clearing the wrong user ID. After inputting the user ID in the area **321**, the user touches the input button **325**. The user then touches the selected keys of the character keypad **323**, thereby inputting his or her password. The password is not displayed in the password area **322**. Rather, a prescribed number asterisks (*) or underline bars (_) are displayed in the password area **322**. After inputting password, the user touches the input button **325**. If a wrong password has been input, the display-input section **20***a* will displays an error message. In this case, the user cannot user the digital copier **1**.

[**0129**] If the user has input the correct password, the display-input section **20***a* will display a job deletion menu. For example, the section **20***a* displays the job deletion menu for user B, which is shown in **FIG. 21**. As shown in **FIG. 21**, the menu has a user name area **330**, a job list area **331**, and a deletion button **332**. The jobs which user B has performed and which are recorded in the queue management table **41** are displayed in the job list area **331**. Seeing these jobs displayed in the area **331**, User B touches any job he or she wishes to delete. Then, the job thus selected is displayed in reverse mode. When user B touches the deletion button **332**, the job selected is deleted.

[**0130**] The second embodiment of the present invention will be described.

[**0131**] In the second embodiment, the print values, which have been set in any personal computer (PC **2**, PC **3**) shown in **FIG. 1** to make a print request to the digital copier **1**, are stored in the personal computer. If the print values are changed in the digital copier **1** to new values, the new print values are transmitted to the personal computer. Hence, the same file can be printed again in the new print values, even if some of the print values, such as print density, are altered to print the file for trial.

[**0132**] The print driver provided in the personal computer (PC **2**, PC **3**) that makes a print request has the driver management table **340** shown in **FIG. 22** to store the print values. The driver management table **340** is recorded on a hard disk (not shown) provided in the personal computer (PC **2**, PC **3**). The driver management table **340** provided in, for example, PC **2** will be described.

[**0133**] As shown in **FIG. 22**, the driver management table. **340** consists of a path/file name field **350**, an issue date field **351**, a document name field **352**, and a set value field **353**.

[**0134**] The paths and file names on the PC **2** are recorded in the path/file name field **350**, so that the files containing the documents, for which a print request has been made, may be identified. The date of making the print request is recorded in the issue date field **351**. The name of the document is recorded in the document name field **352**. And the print values set, such as the density, are recorded in the set value field **353**.

[**0135**] When the driver management table **340** becomes full of data, the old data is erased from the issue date field **351** and new data is stored therein. Thus, the print driver provided in the PC **2** holds the data set when the print request is made in the PC **2**.

[**0136**] **FIG. 23** illustrates the queue management table **400** provided in the digital copier **1**. As **FIG. 23** shows, the table **400** consists of a queue order field **354**, a trial print mode field **355**, a trial preceding mode field **356**, a page field **357**, a user ID field **358**, a job number field **359**, a document name field **360**, a state field **361**, a receipt date-time field **362**, a PC address field **363**, and a file pointer field **364**. The queue management table **400** is recorded, for example, on the hard disk provided in the digital copier **1**.

[**0137**] This table **400** differs from the queue management table **41** used in the first embodiment, only in that it has an additional field, i.e., the PC address field **363**. Therefore, the other fields of the table **400** will not be described.

[**0138**] In the PC address field **363**, the address of any PC that has sent a print job to the digital copier **1**. The header of any data packet transmitted via the LAN usually contains the source address and the destination address. Thus, the address of the PC is acquired from the header of the data packet and is recorded in the PC address field **363**.

[**0139**] Then, in Step S**39** (**FIG. 9**), the various print values are changed. More precisely, the address of the PC which has sent the job is read from the queue management table **400** after all pages of the image data are printed in Step S**42**. The digital copier **1** transmits the data representing the print values to the PC having this address. Upon receipt of this data from the copier **1**, the print driver provided in the PC writes the data in the set value field **353** of the driver management table **340**, deleting the data that has recorded therein before.

[**0140**] The print values set for the file and changed in the PC to achieve trial printing in the digital copier **1** can thereby be restored to ones initially set in the copier **1** for the file. Hence, the file can be printed again in the print values set in the digital copier **1**.

[**0141**] As has been described, the embodiments of the present invention enable the user of a personal computer connected to a LAN to reset print instructions easily at the printer or digital copier connected to the LAN, thereby to get printed sheets of the quality he or she desires.

[**0142**] As has been described in detail, the present invention can provide a printing apparatus and a printing system, which comprises at least one printer and a plurality of personal computers and which enables each user to reset print instructions at the printer to get printed sheets of the quality he or she desires.

[**0143**] Additional advantages and modifications will readily occur to those skilled in the art. Therefore, the invention in its broader aspects is not limited to the specific details and representative embodiments shown and described herein. Accordingly, various modifications may be made without departing from the spirit or scope of the general inventive concept as defined by the appended claims and their equivalents.

1. An image forming apparatus comprising:

receiving means for receiving a plurality of pages of image data transmitted through a communication line

and receiving a partial print request signal requesting that only a part of the image data be printed;

storage means for storing the image data and the partial print request signal, both received at the receiving means; and

printing means for printing a part of the image data in response to the partial print request signal stored in the storage means.

2. An image forming apparatus according to claim 1, wherein the printing means includes second printing means for printing a part of the image data in response to the partial print request signal stored in the storage means, upon receiving a partial print instruction from a user through a control panel provided on the image forming apparatus.

3. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data in response to the partial print request signal stored in the storage means, upon receiving a partial print instruction from a user through a control panel provided on the image forming apparatus; and

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from the user through the control panel after the second printing means has printed the part of the image data.

4. An image forming apparatus according to claim 1, wherein the printing means includes second printing means for printing a part of the image data stored in the storage means, immediately in response to the partial print request signal stored in the storage means.

5. An image forming apparatus according to claim 1, wherein the printing means includes second printing means for printing a part of the image data stored in the storage means, together with an image indicating that data printed is a part of the image data, immediately in response to the partial print request signal stored in the storage means.

6. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data in response to the partial print request signal stored in the storage means, upon receiving a partial print instruction from a user through a control panel provided on the image forming apparatus; and

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from the user through the control panel after the second printing means has printed the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion.

7. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data stored in the storage means, immediately in response to the partial print request signal stored in the storage means; and

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from a user through a control panel provided on the image forming apparatus after the second printing means has printed the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion.

8. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data stored in the storage means, together with an image indicating that data printed is a part of the image data, immediately in response to the partial print request signal stored in the storage means; and

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from a user through a control panel provided on the image forming apparatus after the second printing means has printed the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion.

9. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data in response to the partial print request signal stored in the storage means, upon receiving a partial print instruction from a user through a control panel provided on the image forming apparatus;

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from the user through the control panel after the second printing means has printed the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion; and

transfer means for transferring data representing the specific fashion to a data processing device which has transmitted the image data to the image forming apparatus through the communication line, after the third printing means has printed all pages of image data.

10. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data stored in the storage means, immediately in response to the partial print request signal stored in the storage means;

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from a user through a control panel provided on the image forming apparatus after the second printing means has printed the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion; and

transfer means for transferring data representing the specific fashion to a data processing device which has transmitted the image data to the image forming apparatus through the communication line, after the third printing means has printed all pages of image data.

11. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data stored in the storage means, together with an image indicating that data printed is a part of the image data,

immediately in response to the partial print request signal stored in the storage means;

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from a user through a control panel provided on the image forming apparatus after the second printing means has printed the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion; and

transfer means for transferring data representing the specific fashion to a data processing device which has transmitted the image data to the image forming apparatus through the communication line, after the third printing means has printed all pages of image data.

12. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing a part of the image data in color in response to the partial print request signal stored in the storage means, upon receiving a partial color print instruction from a user through a control panel provided on the image forming apparatus; and

third printing means for printing, in color, all pages of image data stored in the storage means, upon receiving an all-page color print instruction from the user through the control panel after the second printing means has printed the part of the image data in color.

13. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing, in color, a part of the image data stored in the storage means, immediately in response to the partial print request signal stored in the storage means; and

third printing means for printing, in color, all pages of image data stored in the storage means, upon receiving an all-page color print instruction from a user through a control panel provided on the image forming apparatus, after the second printing means has printed the part of the image data in color.

14. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing, in color, a part of the image data stored in the storage means, together with an image indicating that data printed is a part of the image data, immediately in response to the partial print request signal stored in the storage means; and

third printing means for printing, in color, all pages of image data stored in the storage means, upon receiving an all-page color print instruction from a user through a control panel provided on the image forming apparatus, after the second printing means has printed the part of the image data in color.

15. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing, in color, a part of the image data in color in response to the partial print request signal stored in the storage means, upon receiving a partial color print instruction from a user through a control panel provided on the image forming apparatus;

third printing means for printing, in color, all pages of image data stored in the storage means, upon receiving an all-page print instruction from the user through the control panel after the second printing means has printed, in color, the part of the image data, said all-page print instruction demanding that the image data be printed in a specific fashion in color; and

transfer means for transferring data representing the specific fashion to a data processing device which has transmitted the image data to the image forming apparatus through the communication line, after the third printing means has printed, in color, all pages of image data.

16. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing, in color, a part of the image data stored in the storage means, immediately in response to the partial print request signal stored in the storage means;

third printing means for printing, in color, all pages of image data stored in the storage means, upon receiving an all-page color print instruction from a user through a control panel provided on the image forming apparatus, after the second printing means has printed the part of the image data in color, said all-page print instruction demanding that the image data be printed in a specific fashion in color; and

transfer means for transferring data representing the specific fashion to a data processing device which has transmitted the image data to the image forming apparatus through the communication line, after the third printing means has printed, in color, all pages of image data.

17. An image forming apparatus according to claim 1, wherein the printing means includes:

second printing means for printing, in color, a part of the image data stored in the storage means, together with an image indicating that data printed is a part of the image data, immediately in response to the partial print request signal stored in the storage means;

third printing means for printing, in color, all pages of image data stored in the storage means, upon receiving an all-page color print instruction from a user through a control panel provided on the image forming apparatus, after the second printing means has printed the part of the image data in color, said all-page print instruction demanding that the image data be printed in a specific fashion in color; and

transfer means for transferring data representing the specific fashion to a data processing device which has transmitted the image data to the image forming apparatus through the communication line, after the third printing means has printed, in color, all pages of image data.

18. An image forming system comprising:

a plurality of data processing devices for transferring image data to be printed and a partial print request signal requesting that only a part of the image data be printed, both through a communication line; and

a printing apparatus having:

receiving means for receiving a plurality of pages of the image data and the partial print request signal from the data processing devices through the communication line;

storage means for storing the image data and the partial print request signal, both received at the receiving means;

first printing means for printing a part of the image data in response to the partial print request signal stored in the storage means;

second printing means for printing a part of the image data in response to the partial print request signal stored in the storage means, upon receiving a partial print instruction from a user through a control panel provided on the image forming apparatus; and

third printing means for printing all pages of image data stored in the storage means, upon receiving an all-page print instruction from the user through the control panel after the second printing means has printed the part of the image data.

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