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Yamaguchi

(54) **PRINTING SYSTEM, CONTROLLING METHOD, PRINTING APPARATUS, AND STORAGE MEDIUM**

(75) Inventor: **Naohiro Yamaguchi**, Kawasaki-shi (JP)

Correspondence Address:
ROSSI, KIMMS & McDOWELL LLP.
20609 Gordon Park Square, Suite 150
Ashburn, VA 20147 (US)

(73) Assignee: **CANON KABUSHIKI KAISHA**, Tokyo (JP)

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(52) **U.S. Cl.** **358/1.15**

(57) **ABSTRACT**

A printer is caused to perform a checking print for a job in a case that a predetermined user's instruction is received via a user interface. The printer is caused to perform the checking print for the job without receiving the predetermined user's instruction in a case that the job meets a predetermined condition.

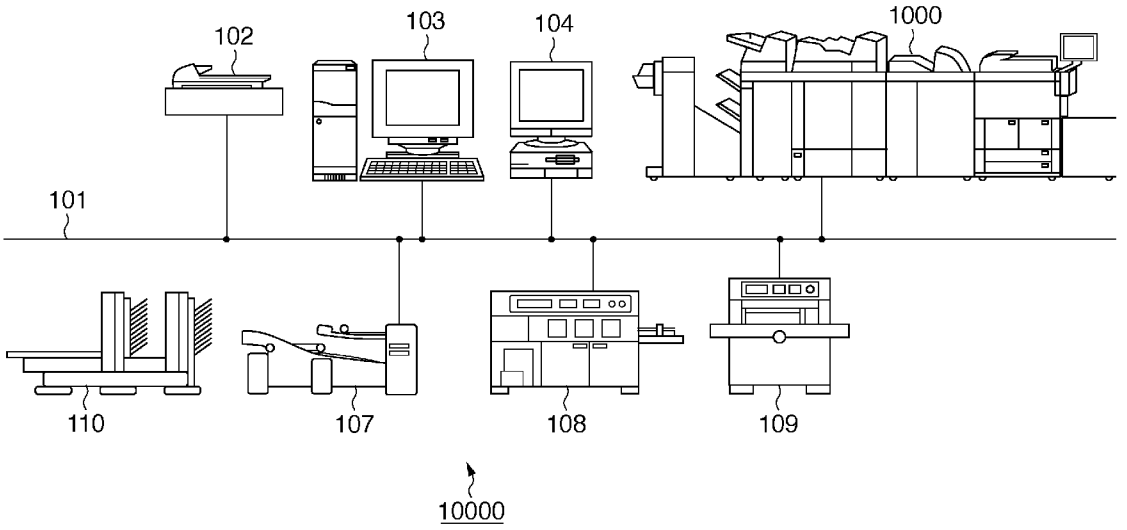


FIG. 1

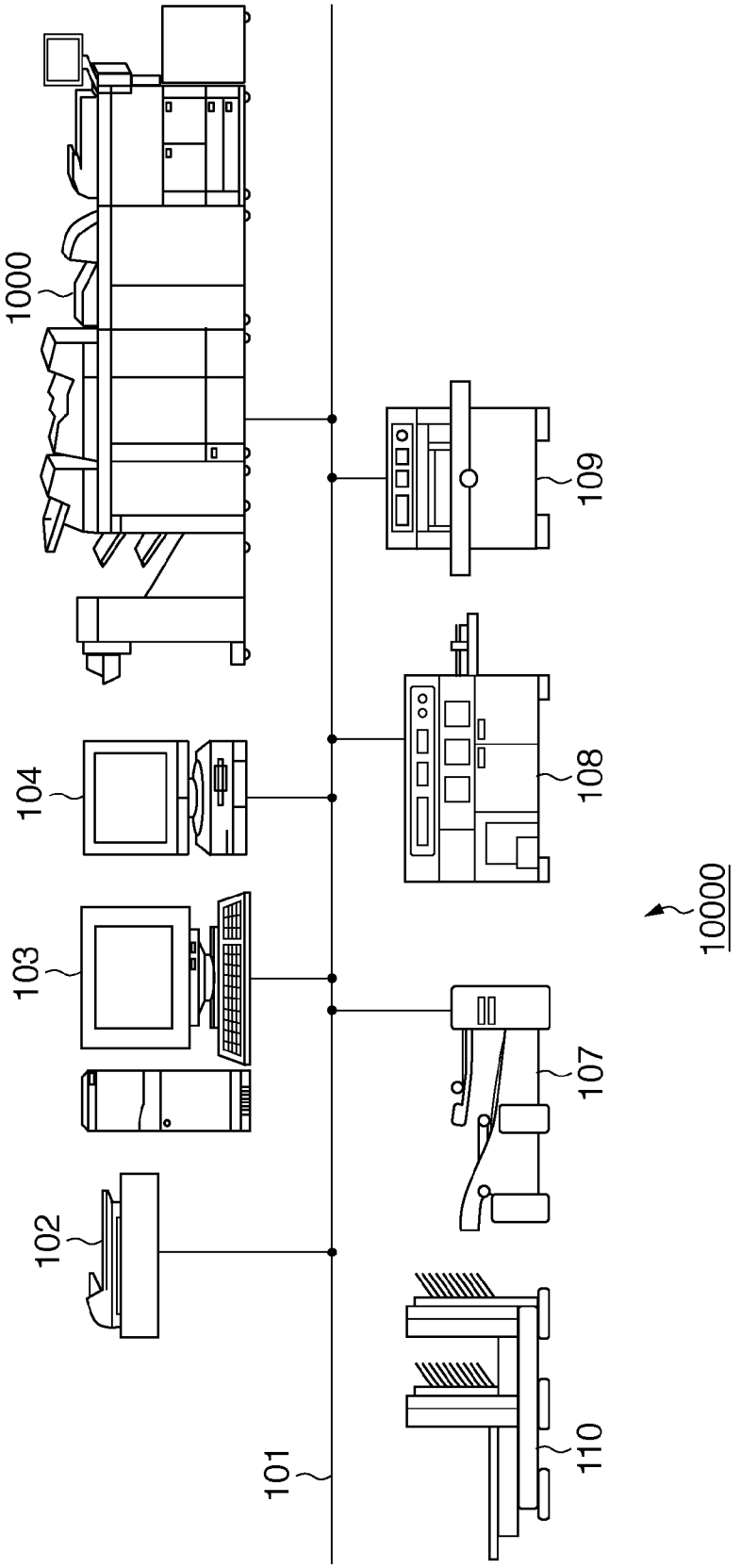


FIG. 2

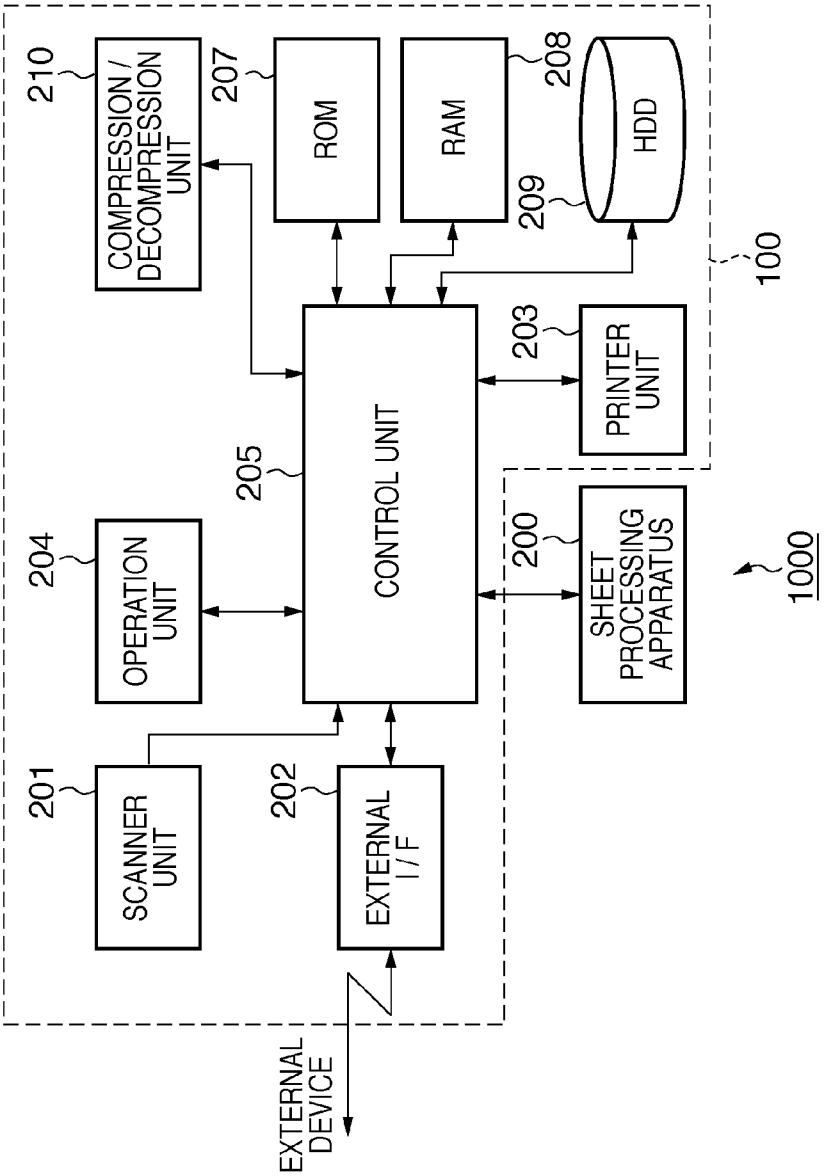

210
COMPRESSION / DECOMPRESSION UNIT
207
ROM
RAM
208
HDD
209
100
203
PRINTER UNIT
205
CONTROL UNIT
204
OPERATION UNIT
200
SHEET PROCESSING APPARATUS
1000
201
SCANNER UNIT
202
EXTERNAL I/F
EXTERNAL DEVICE

FIG. 3

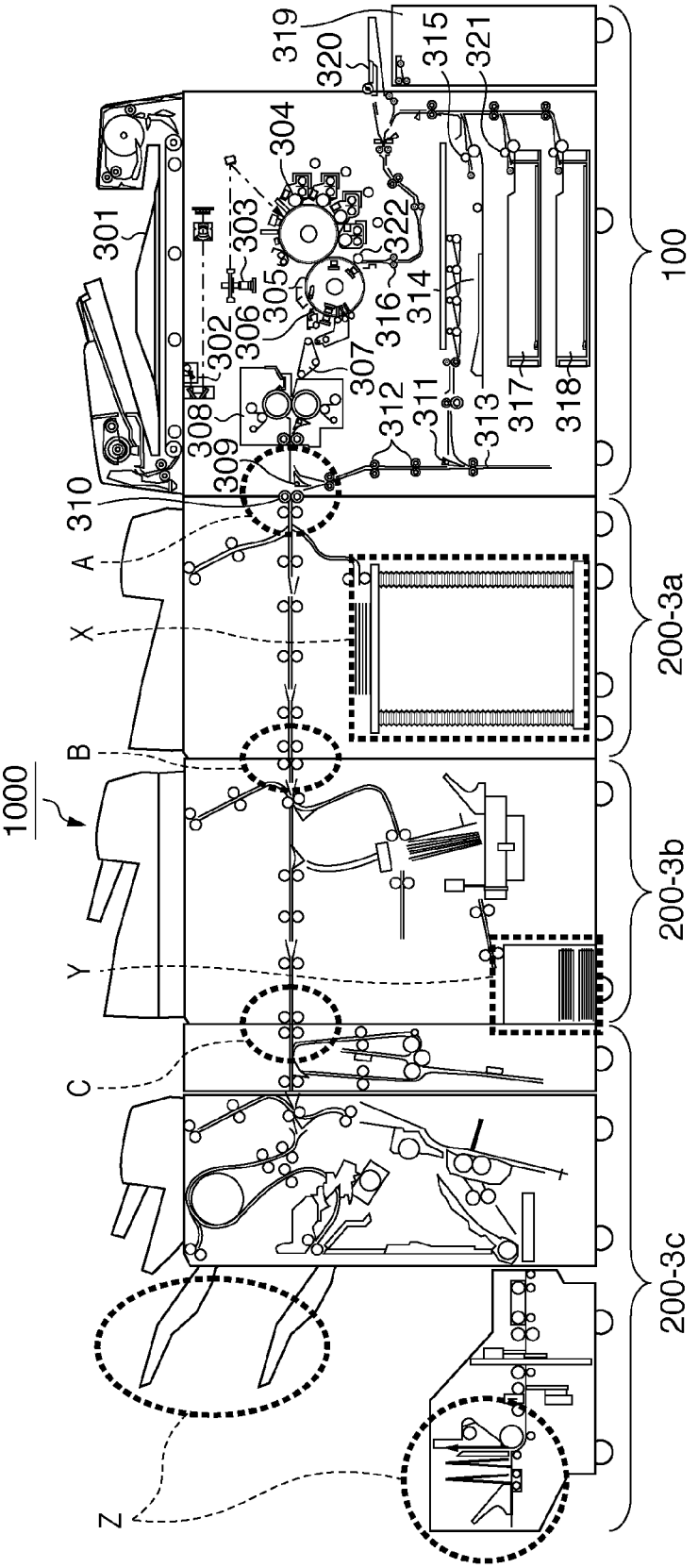

1000
100
200-3a
200-3b
200-3c
301
302
303
304
305
306
307
308
309
310
311
312
313
314
315
316
317
318
319
320
321
322
A
B
C
X
Y
Z

FIG. 4

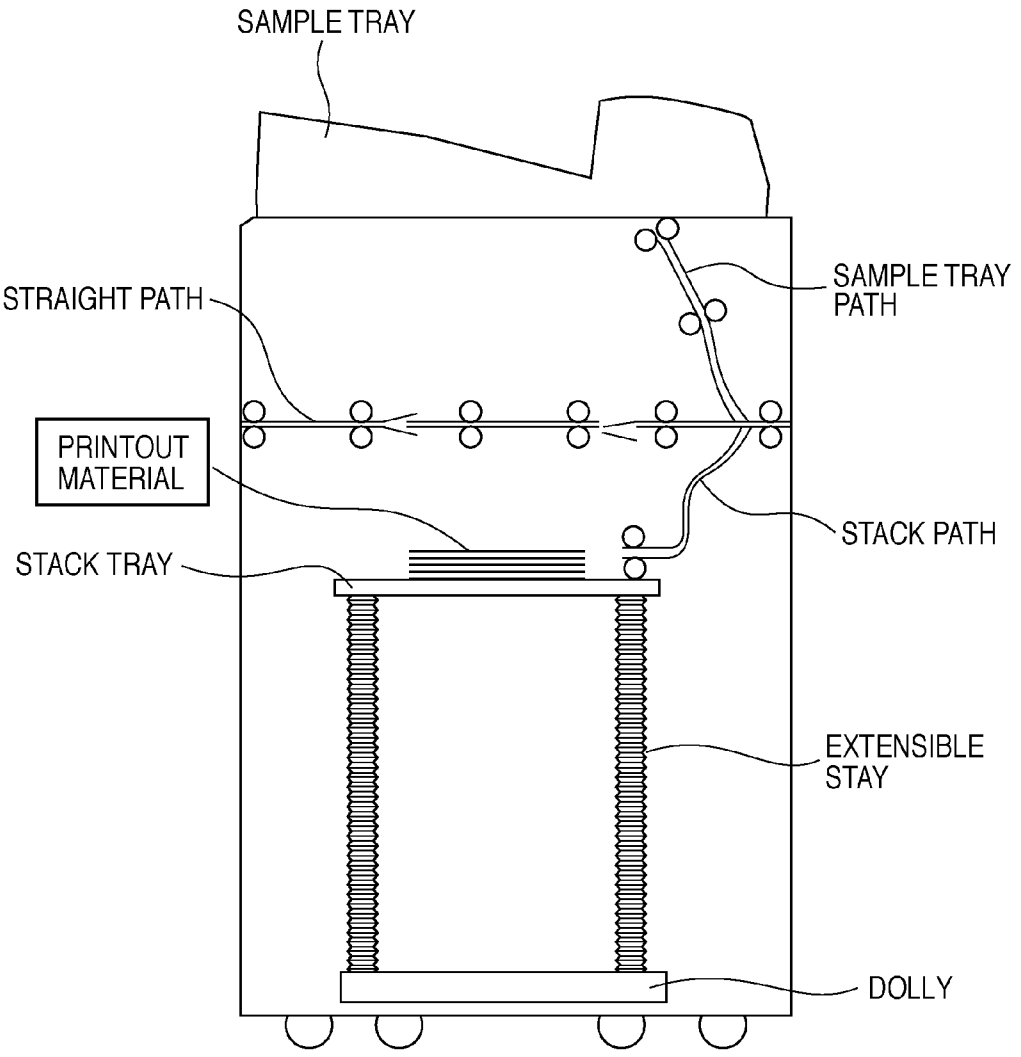

SAMPLE TRAY
STRAIGHT PATH
SAMPLE TRAY PATH
PRINTOUT MATERIAL
STACK PATH
STACK TRAY
EXTENSIBLE STAY
DOLLY

FIG. 5

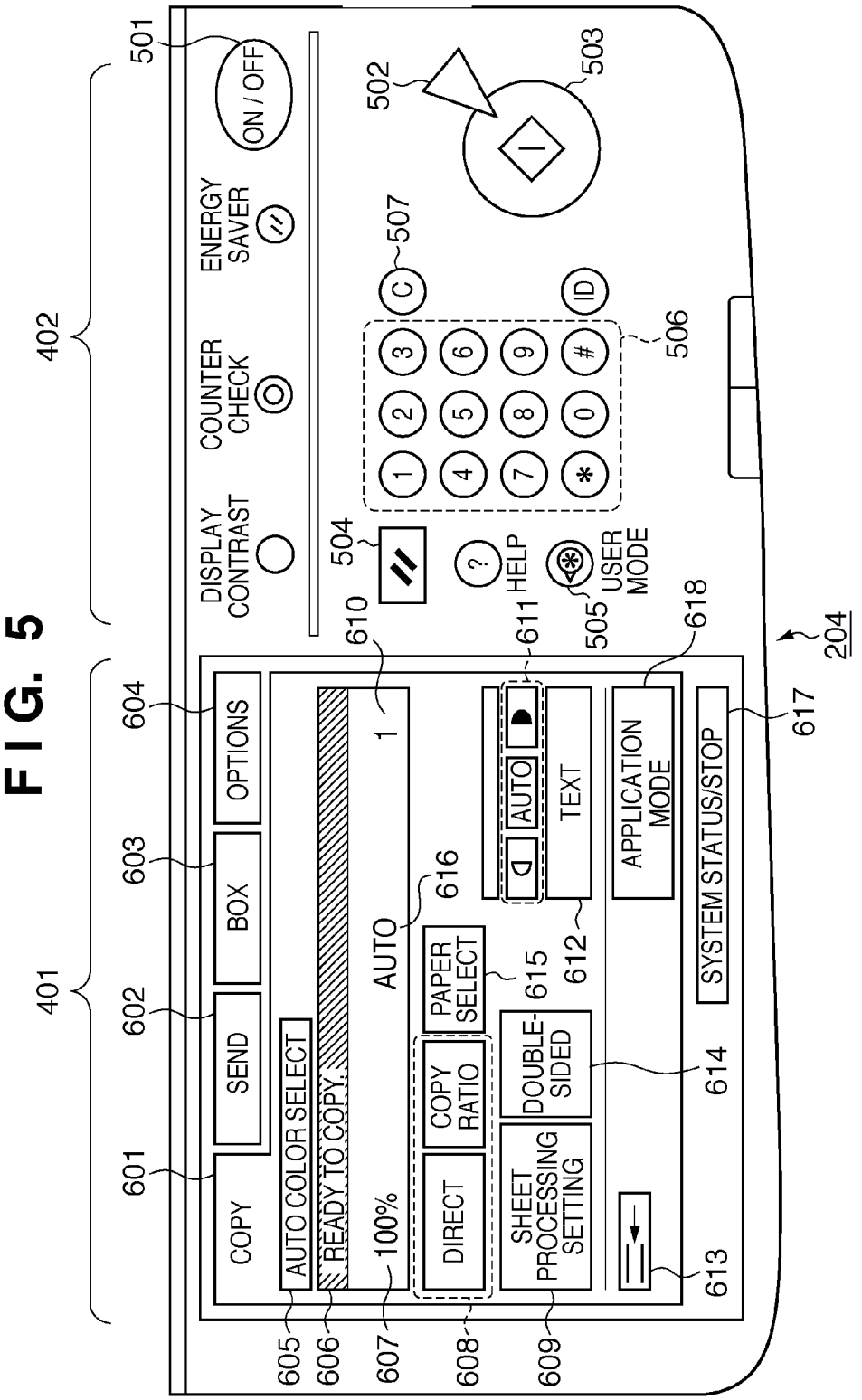

401
402
501
ON / OFF
ENERGY SAVER
COUNTER CHECK
DISPLAY CONTRAST
502
503
507
C
ID
506
1 2 3
4 5 6
7 8 9
* 0 #
504
HELP
USER MODE
505
610
611
618
204
617
604
603
602
601
OPTIONS
BOX
SEND
COPY
AUTO COLOR SELECT
READY TO COPY
100%
AUTO
1
DIRECT
COPY RATIO
PAPER SELECT
616
615
SHEET PROCESSING SETTING
DOUBLE-SIDED
612
614
AUTO
TEXT
APPLICATION MODE
SYSTEM STATUS/STOP
613
605
606
607
608
609

FIG. 6

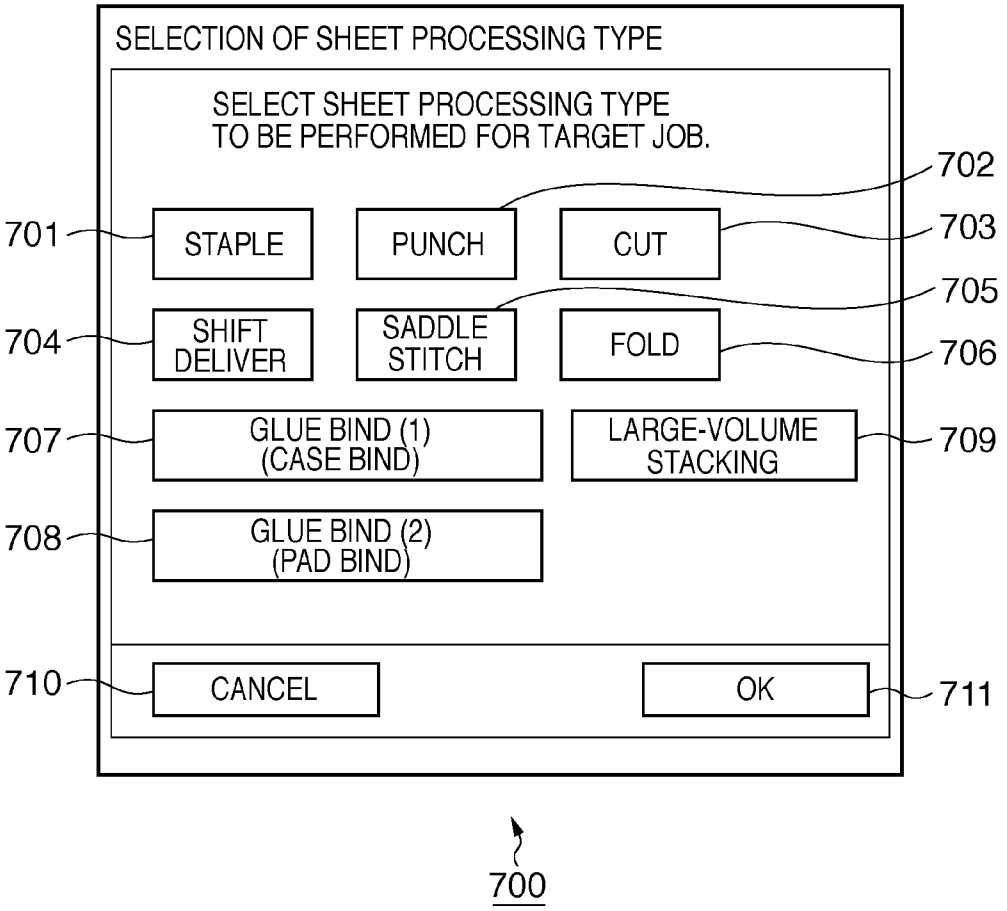

SELECTION OF SHEET PROCESSING TYPE
SELECT SHEET PROCESSING TYPE TO BE PERFORMED FOR TARGET JOB.
STAPLE
PUNCH
CUT
SHIFT DELIVER
SADDLE STITCH
FOLD
GLUE BIND (1) (CASE BIND)
LARGE-VOLUME STACKING
GLUE BIND (2) (PAD BIND)
CANCEL
OK
701
702
703
704
705
706
707
708
709
710
711
700

FIG. 7

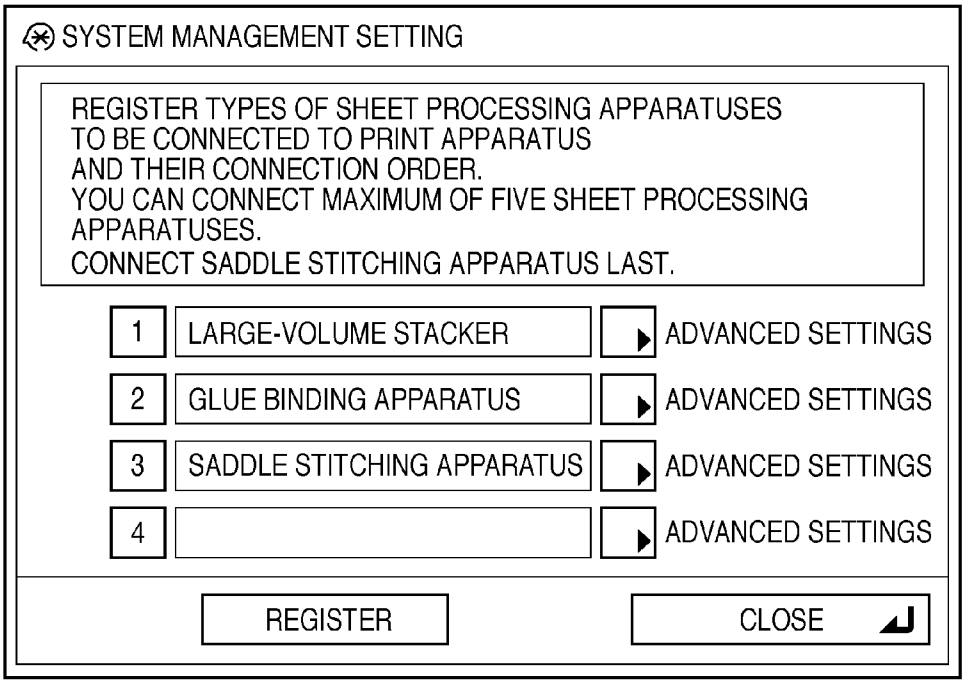

SYSTEM MANAGEMENT SETTING
REGISTER TYPES OF SHEET PROCESSING APPARATUSES TO BE CONNECTED TO PRINT APPARATUS AND THEIR CONNECTION ORDER.
YOU CAN CONNECT MAXIMUM OF FIVE SHEET PROCESSING APPARATUSES.
CONNECT SADDLE STITCHING APPARATUS LAST.
1
LARGE-VOLUME STACKER
ADVANCED SETTINGS
2
GLUE BINDING APPARATUS
ADVANCED SETTINGS
3
SADDLE STITCHING APPARATUS
ADVANCED SETTINGS
4
ADVANCED SETTINGS
REGISTER
CLOSE

FIG. 8

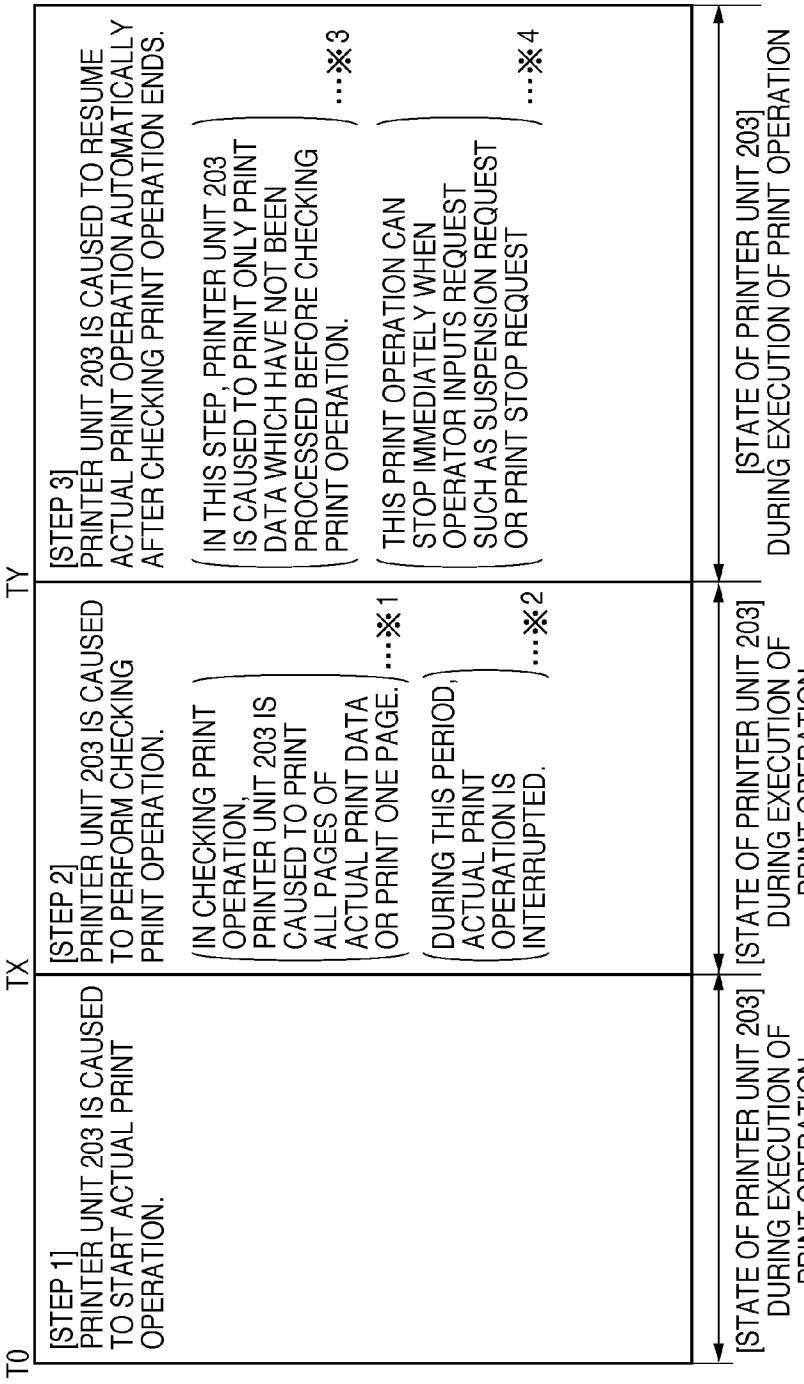

T0
TX
TY
[STEP 1]
PRINTER UNIT 203 IS CAUSED TO START ACTUAL PRINT OPERATION.
[STEP 2]
PRINTER UNIT 203 IS CAUSED TO PERFORM CHECKING PRINT OPERATION.
(IN CHECKING PRINT OPERATION, PRINTER UNIT 203 IS CAUSED TO PRINT ALL PAGES OF ACTUAL PRINT DATA OR PRINT ONE PAGE.) ...※1
(DURING THIS PERIOD, ACTUAL PRINT OPERATION IS INTERRUPTED.) ...※2
[STEP 3]
PRINTER UNIT 203 IS CAUSED TO RESUME ACTUAL PRINT OPERATION AUTOMATICALLY AFTER CHECKING PRINT OPERATION ENDS.
(IN THIS STEP, PRINTER UNIT 203 IS CAUSED TO PRINT ONLY PRINT DATA WHICH HAVE NOT BEEN PROCESSED BEFORE CHECKING PRINT OPERATION.) ...※3
(THIS PRINT OPERATION CAN STOP IMMEDIATELY WHEN OPERATOR INPUTS REQUEST SUCH AS SUSPENSION REQUEST OR PRINT STOP REQUEST) ...※4
[STATE OF PRINTER UNIT 203] DURING EXECUTION OF PRINT OPERATION
[STATE OF PRINTER UNIT 203] DURING EXECUTION OF PRINT OPERATION
[STATE OF PRINTER UNIT 203] DURING EXECUTION OF PRINT OPERATION

FIG. 9A

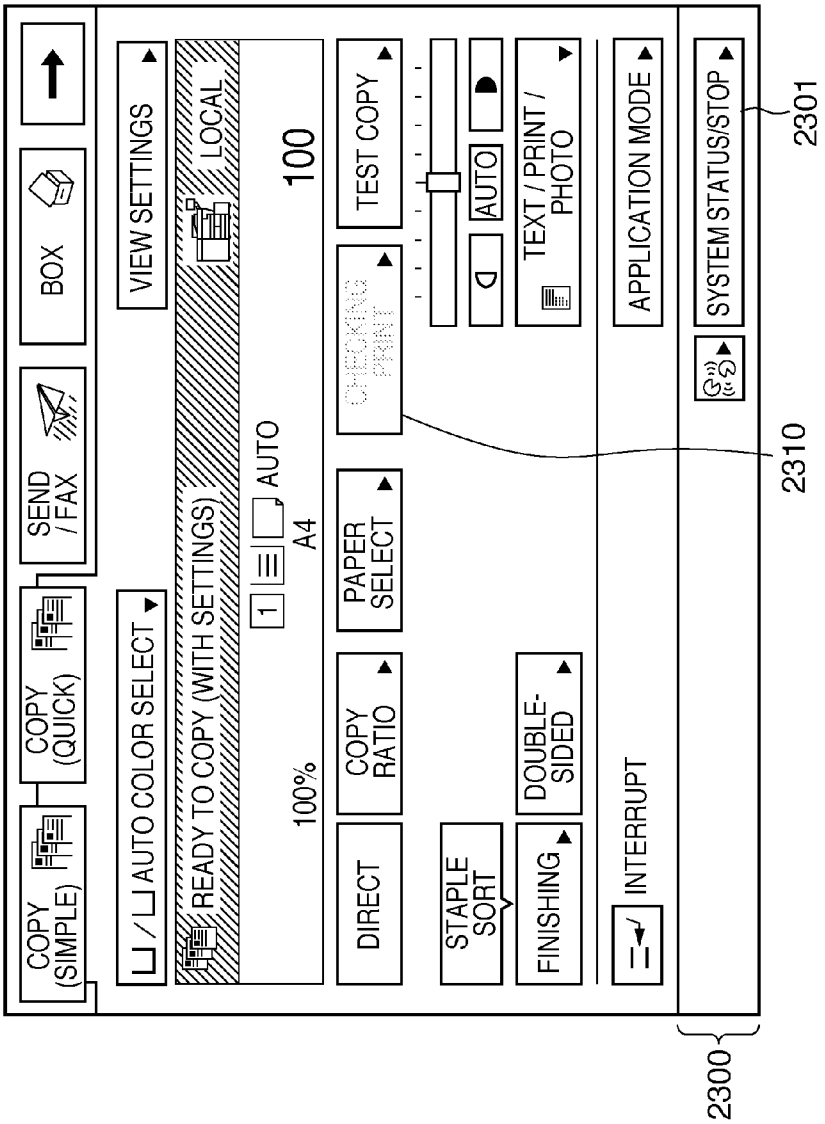

COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
VIEW SETTINGS
AUTO COLOR SELECT
READY TO COPY (WITH SETTINGS)
LOCAL
100
AUTO
A4
100%
DIRECT
COPY RATIO
PAPER SELECT
CHECKING PRINT
TEST COPY
STAPLE SORT
AUTO
FINISHING
DOUBLE-SIDED
TEXT / PRINT / PHOTO
INTERRUPT
APPLICATION MODE
SYSTEM STATUS/STOP
2300
2310
2301

FIG. 9B

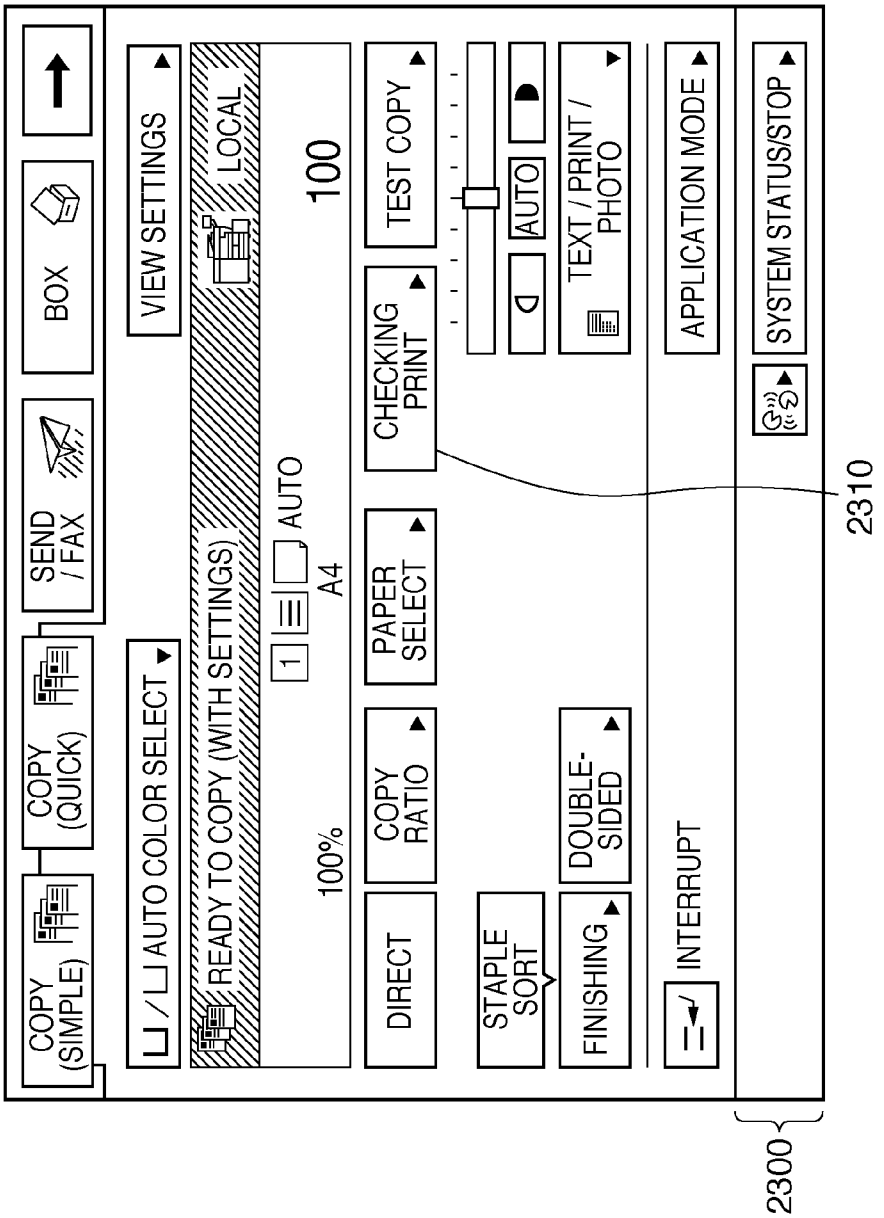

COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
AUTO COLOR SELECT
VIEW SETTINGS
READY TO COPY (WITH SETTINGS)
LOCAL
100%
AUTO
A4
100
DIRECT
COPY RATIO
PAPER SELECT
CHECKING PRINT
TEST COPY
STAPLE SORT
FINISHING
DOUBLE-SIDED
AUTO
TEXT / PRINT / PHOTO
INTERRUPT
APPLICATION MODE
SYSTEM STATUS/STOP
2300
2310

FIG. 9C

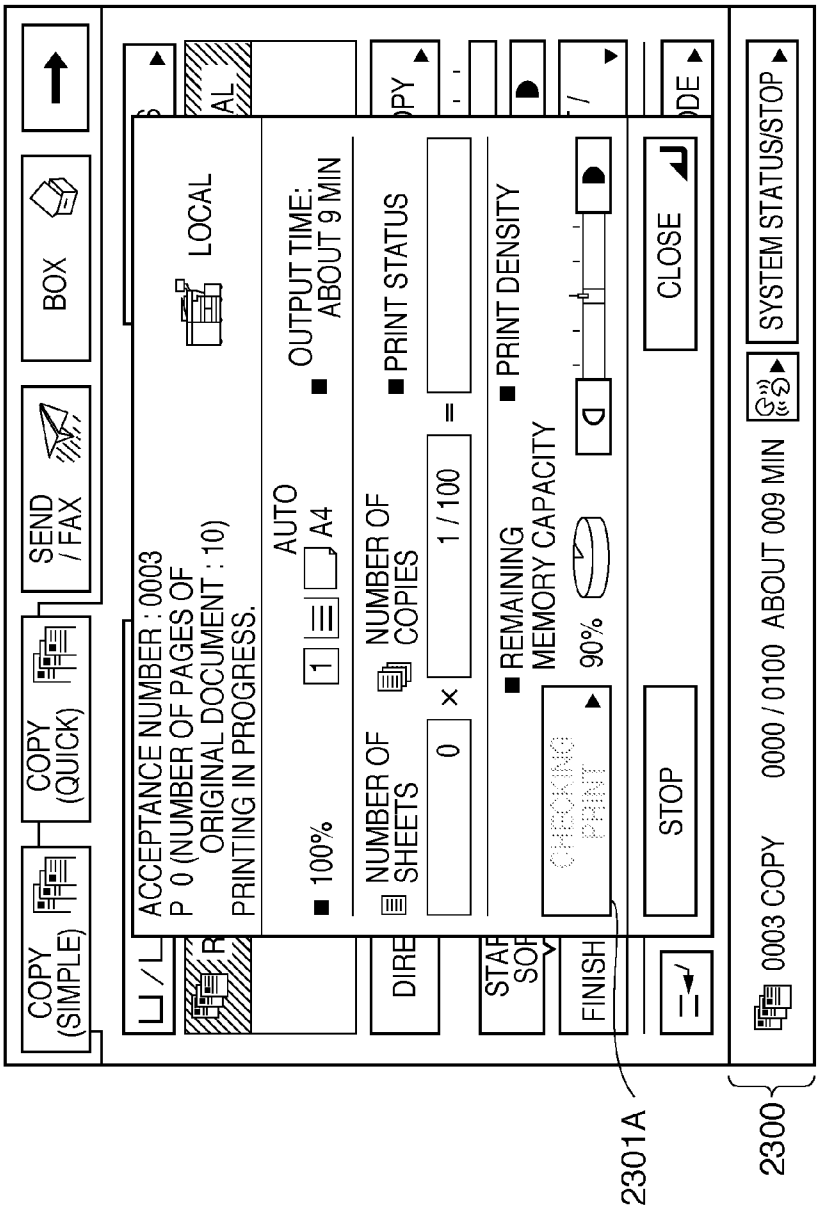

COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
ACCEPTANCE NUMBER : 0003
P 0 (NUMBER OF PAGES OF ORIGINAL DOCUMENT : 10)
PRINTING IN PROGRESS.
LOCAL
AUTO
100%
A4
OUTPUT TIME: ABOUT 9 MIN
NUMBER OF SHEETS
0
NUMBER OF COPIES
1 / 100
PRINT STATUS
REMAINING MEMORY CAPACITY
90%
PRINT DENSITY
CHROMING PRINT
FINISH
STOP
CLOSE
SYSTEM STATUS/STOP
0003 COPY
0000 / 0100 ABOUT 009 MIN
2301A
2300

FIG. 9D

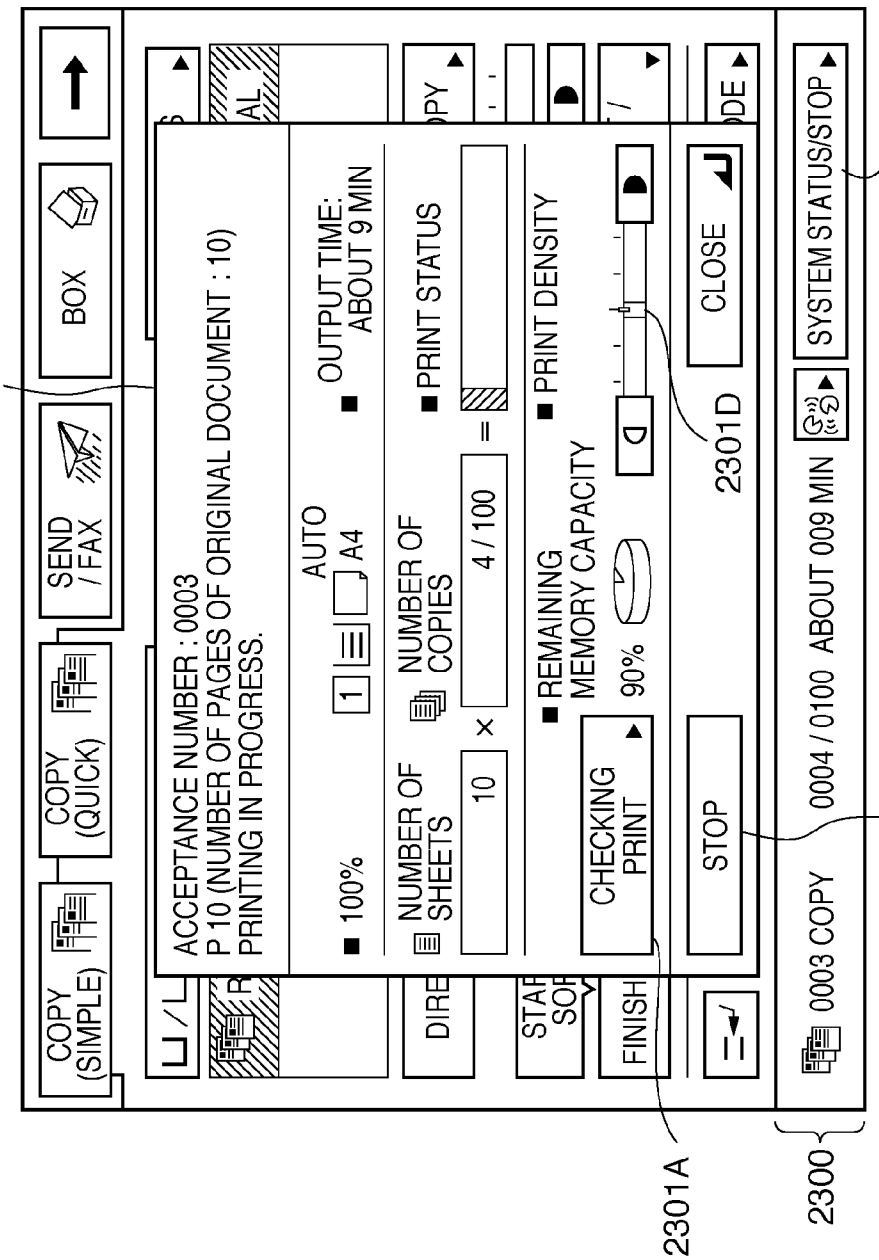

2300A
COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
ACCEPTANCE NUMBER : 0003
P 10 (NUMBER OF PAGES OF ORIGINAL DOCUMENT : 10)
PRINTING IN PROGRESS.
AUTO
A4
100%
OUTPUT TIME: ABOUT 9 MIN
NUMBER OF SHEETS
10
NUMBER OF COPIES
4 / 100
PRINT STATUS
REMAINING MEMORY CAPACITY
90%
PRINT DENSITY
CHECKING PRINT
STOP
CLOSE
FINISH
0003 COPY
0004 / 0100 ABOUT 009 MIN
SYSTEM STATUS/STOP
2301A
2301C
2301D
2301
2300

FIG. 9E

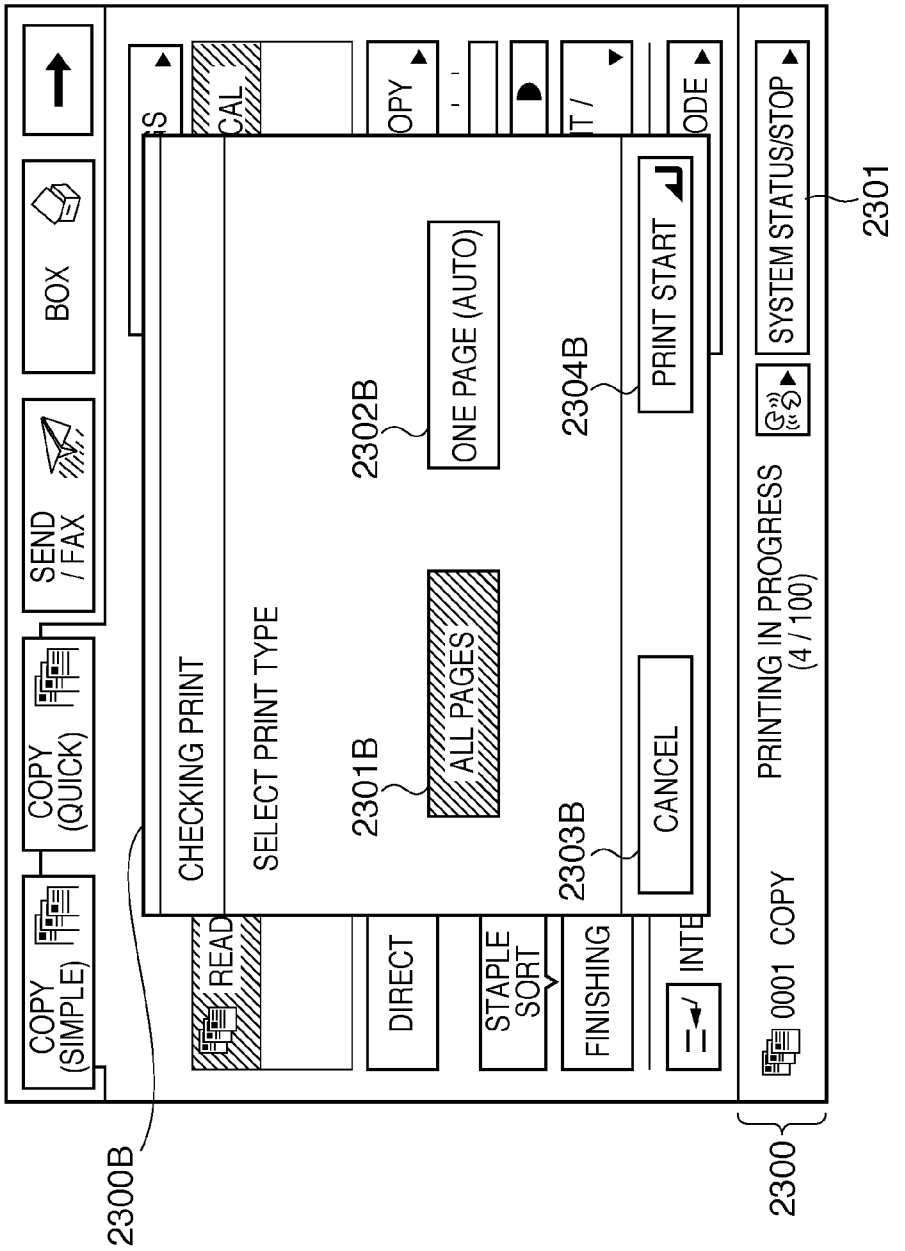

COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
CHECKING PRINT
SELECT PRINT TYPE
2301B
ALL PAGES
2302B
ONE PAGE (AUTO)
2303B
CANCEL
2304B
PRINT START
READ
DIRECT
STAPLE SORT
FINISHING
0001 COPY
PRINTING IN PROGRESS (4 / 100)
SYSTEM STATUS/STOP
2300B
2300
2301

FIG. 9F

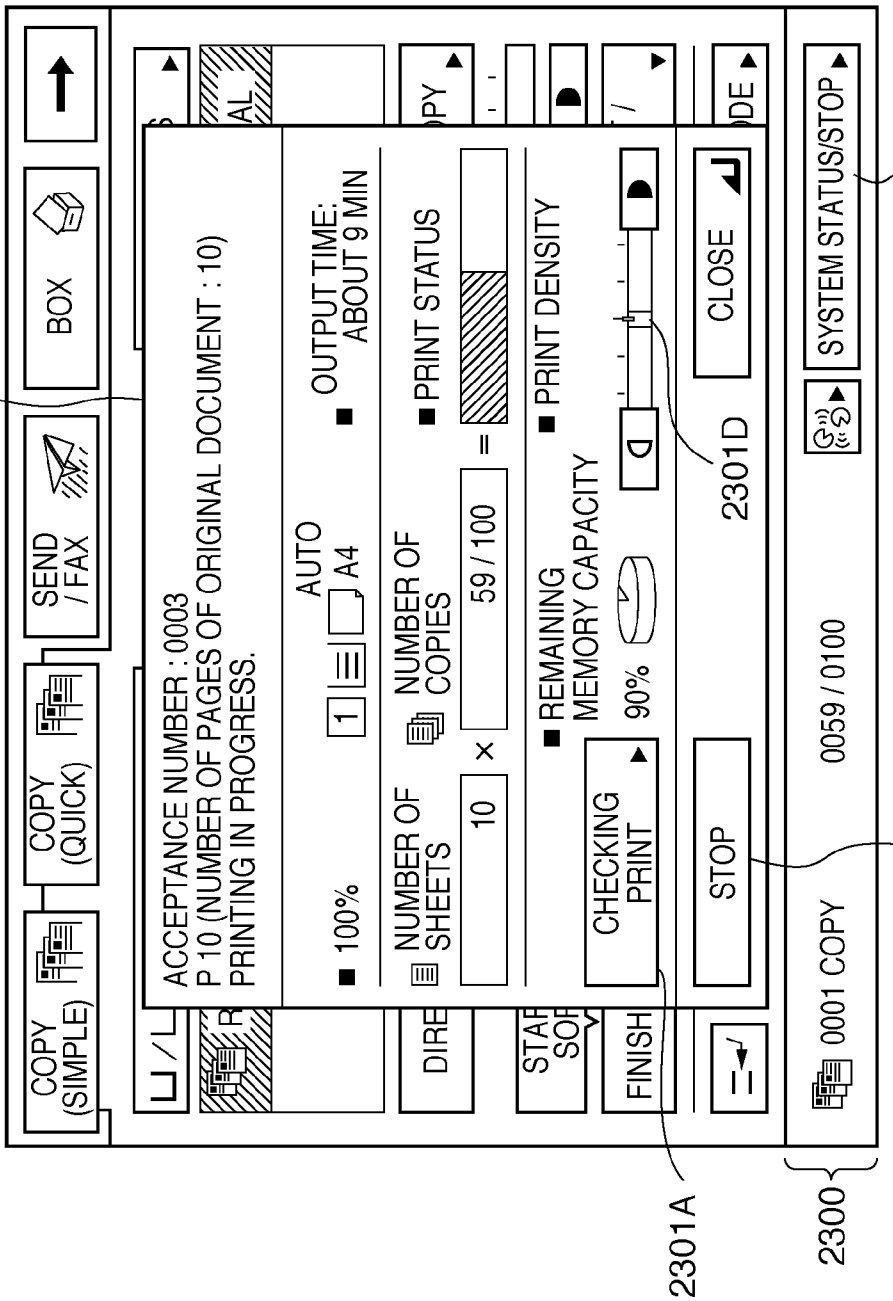

2300A
COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
ACCEPTANCE NUMBER : 0003
P 10 (NUMBER OF PAGES OF ORIGINAL DOCUMENT : 10)
PRINTING IN PROGRESS.
AUTO
A4
OUTPUT TIME: ABOUT 9 MIN
100%
NUMBER OF SHEETS
10
NUMBER OF COPIES
59 / 100
PRINT STATUS
REMAINING MEMORY CAPACITY
90%
PRINT DENSITY
CHECKING PRINT
STOP
CLOSE
FINISH
0001 COPY
0059 / 0100
SYSTEM STATUS/STOP
2301
2301A
2301C
2301D
2300

FIG. 10A

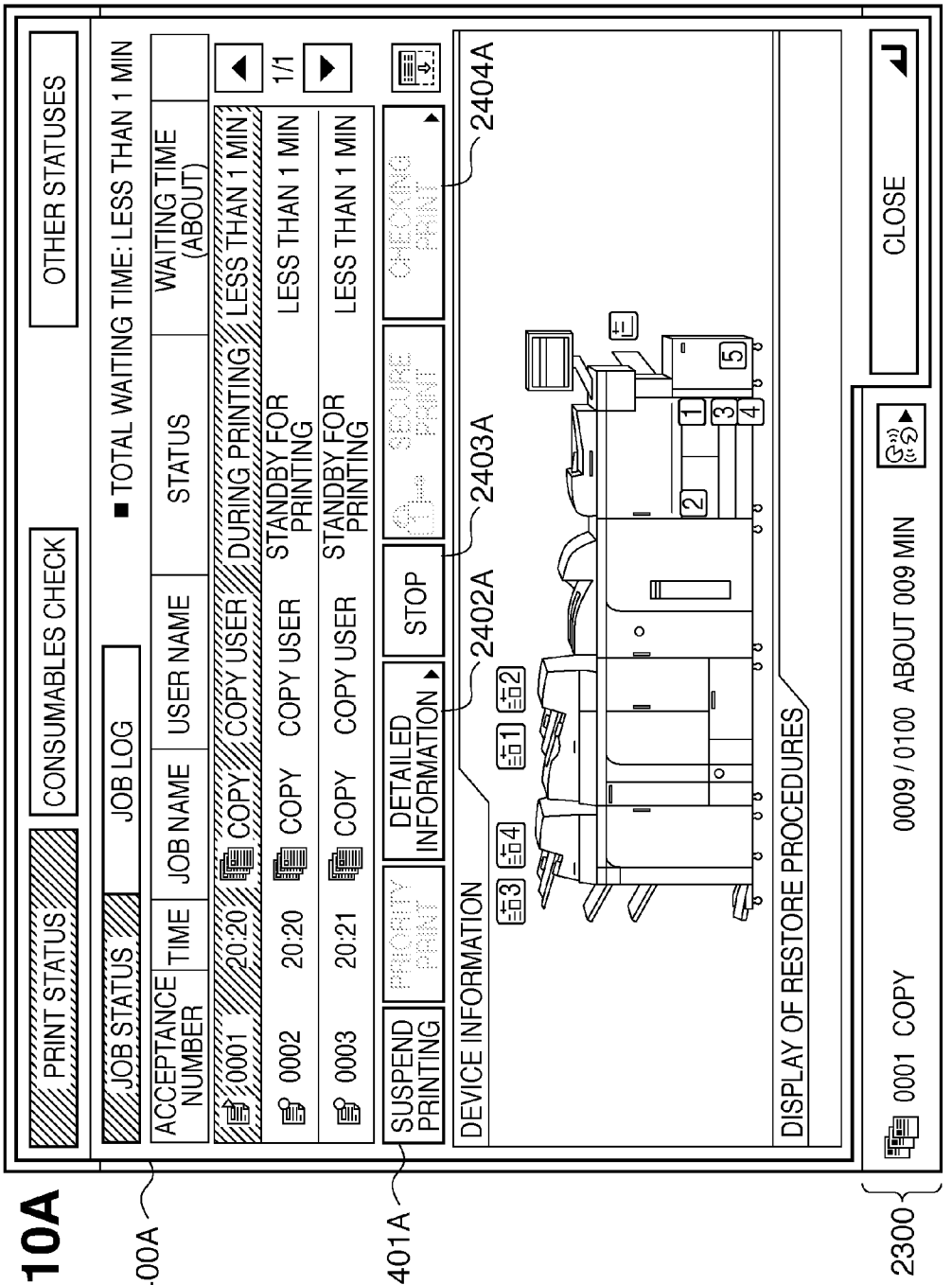

PRINT STATUS
CONSUMABLES CHECK
OTHER STATUSES
JOB STATUS
JOB LOG
■ TOTAL WAITING TIME: LESS THAN 1 MIN
ACCEPTANCE NUMBER
TIME
JOB NAME
USER NAME
STATUS
WAITING TIME (ABOUT)
0001 20:20 COPY COPY USER DURING PRINTING LESS THAN 1 MIN
0002 20:20 COPY COPY USER STANDBY FOR PRINTING LESS THAN 1 MIN
0003 20:21 COPY COPY USER STANDBY FOR PRINTING LESS THAN 1 MIN
1/1
SUSPEND PRINTING
PRIORITY PRINT
DETAILED INFORMATION
STOP
RESUME PRINT
CHECKING PRINT
DEVICE INFORMATION
DISPLAY OF RESTORE PROCEDURES
CLOSE
0001 COPY
0009 / 0100 ABOUT 009 MIN
2400A
2401A
2402A
2403A
2404A
2300

FIG. 10B

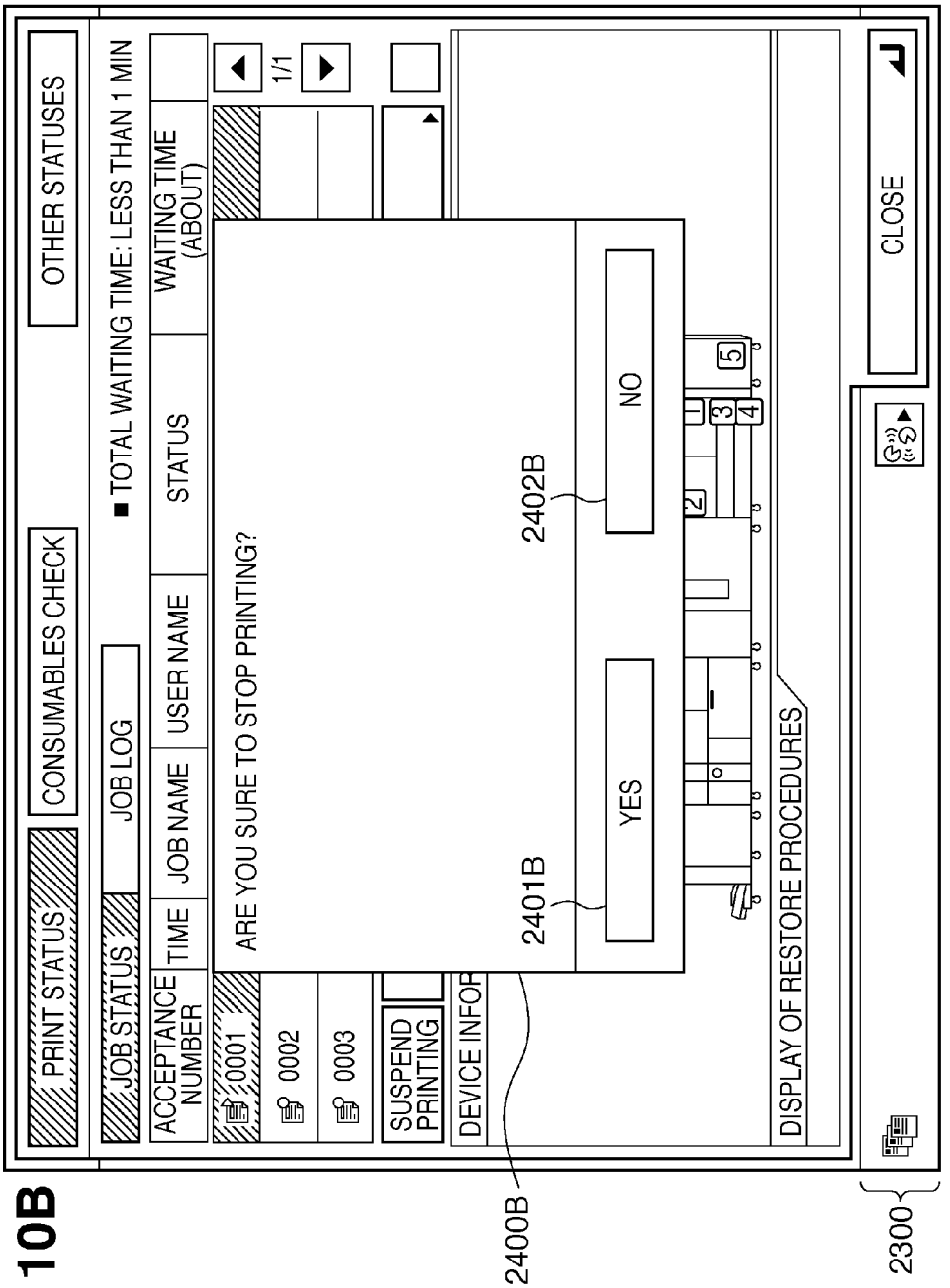

PRINT STATUS
CONSUMABLES CHECK
OTHER STATUSES
JOB STATUS
JOB LOG
■ TOTAL WAITING TIME: LESS THAN 1 MIN
ACCEPTANCE NUMBER
TIME
JOB NAME
USER NAME
STATUS
WAITING TIME (ABOUT)
0001
0002
0003
1/1
SUSPEND PRINTING
DEVICE INFOR
ARE YOU SURE TO STOP PRINTING?
YES
NO
2401B
2402B
DISPLAY OF RESTORE PROCEDURES
CLOSE
2400B
2300

FIG. 10C

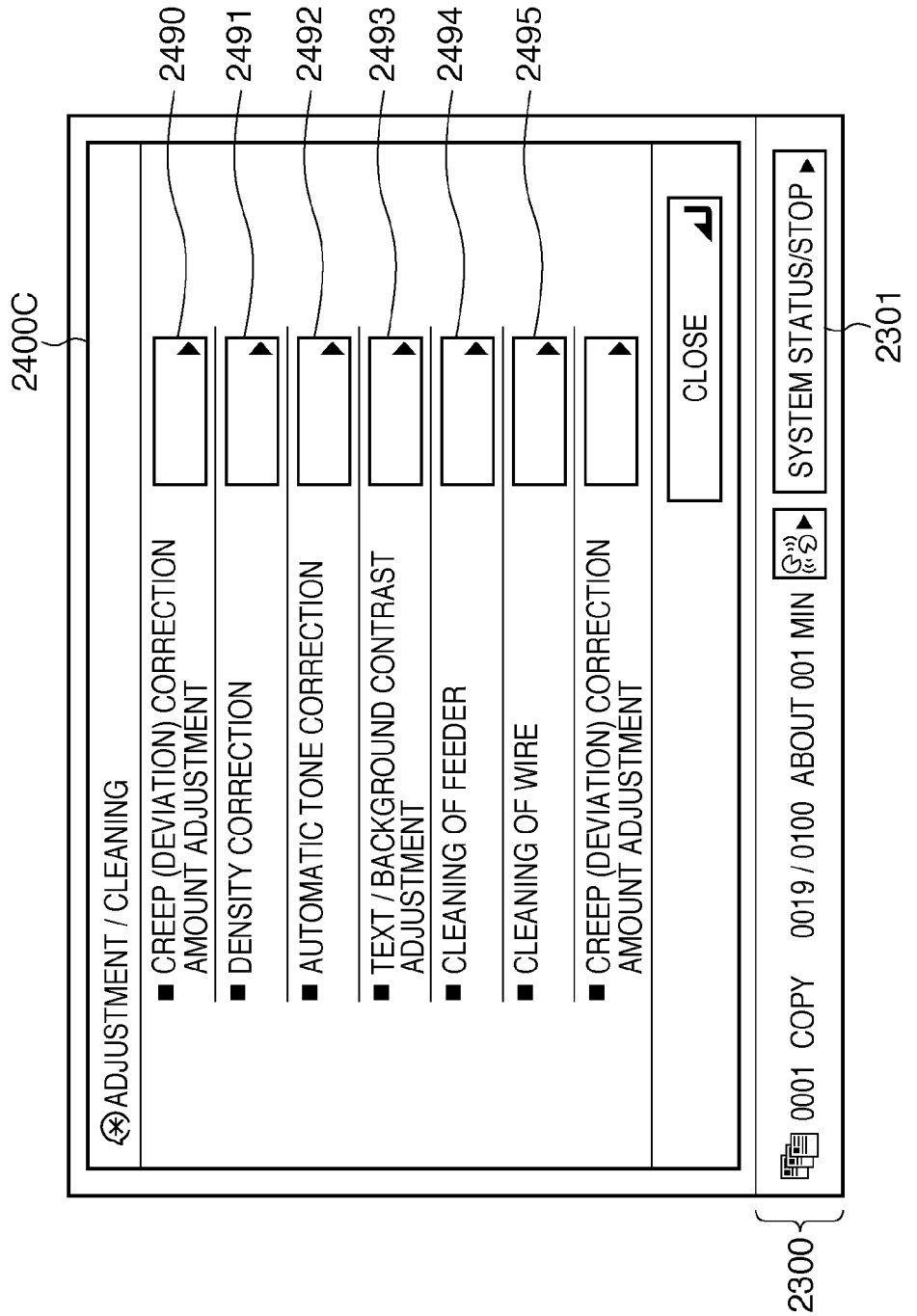

2400C
2490
2491
2492
2493
2494
2495
ADJUSTMENT / CLEANING
■ CREEP (DEVIATION) CORRECTION AMOUNT ADJUSTMENT
■ DENSITY CORRECTION
■ AUTOMATIC TONE CORRECTION
■ TEXT / BACKGROUND CONTRAST ADJUSTMENT
■ CLEANING OF FEEDER
■ CLEANING OF WIRE
■ CREEP (DEVIATION) CORRECTION AMOUNT ADJUSTMENT
CLOSE
0001 COPY 0019 / 0100 ABOUT 001 MIN
SYSTEM STATUS/STOP
2301
2300

FIG. 10D

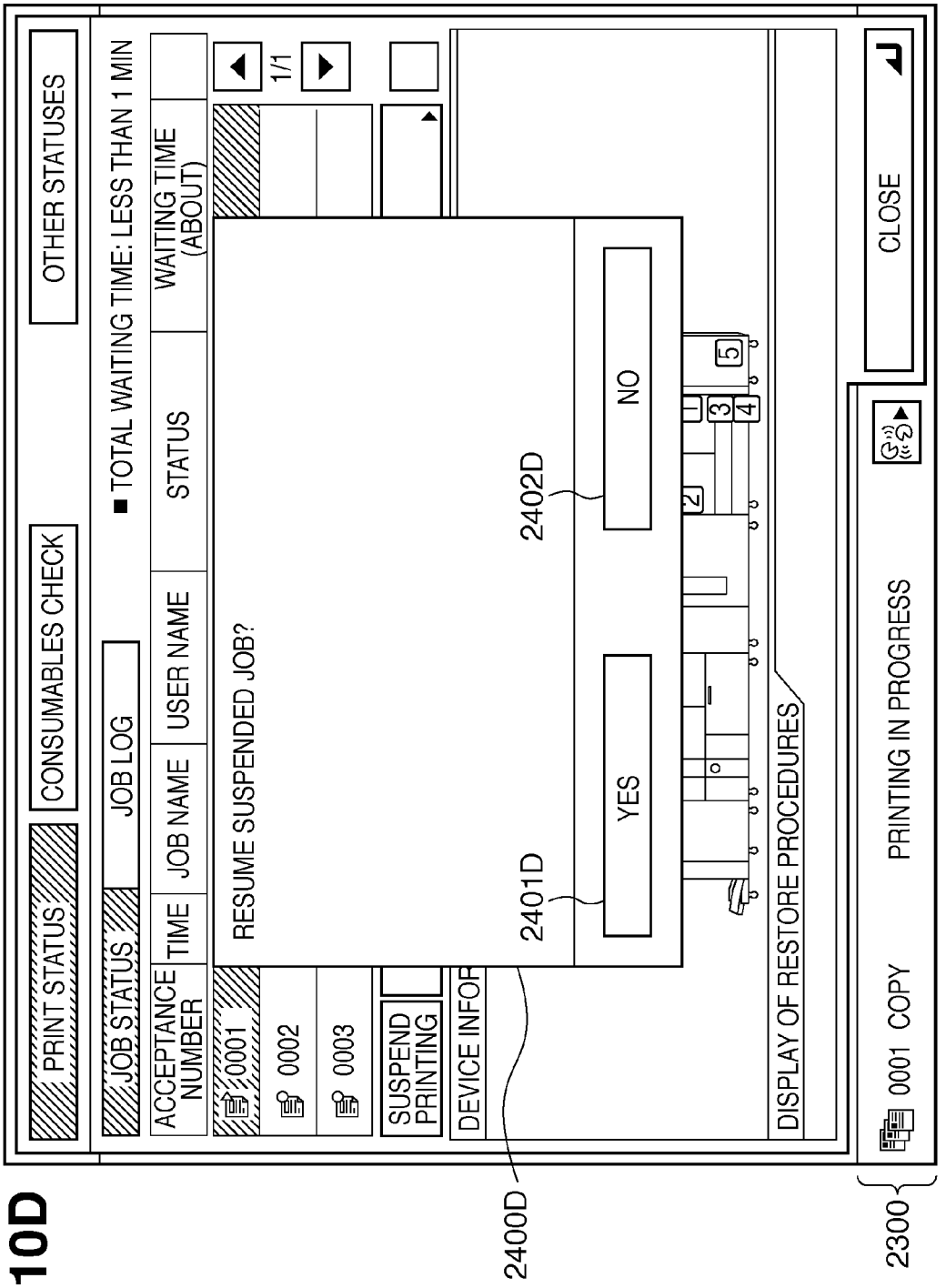

PRINT STATUS
CONSUMABLES CHECK
OTHER STATUSES
JOB STATUS
JOB LOG
■ TOTAL WAITING TIME: LESS THAN 1 MIN
ACCEPTANCE NUMBER
TIME
JOB NAME
USER NAME
STATUS
WAITING TIME (ABOUT)
0001
0002
0003
1/1
SUSPEND PRINTING
DEVICE INFOR
RESUME SUSPENDED JOB?
YES
NO
2401D
2402D
2400D
DISPLAY OF RESTORE PROCEDURES
CLOSE
0001 COPY
PRINTING IN PROGRESS
2300

FIG. 10E

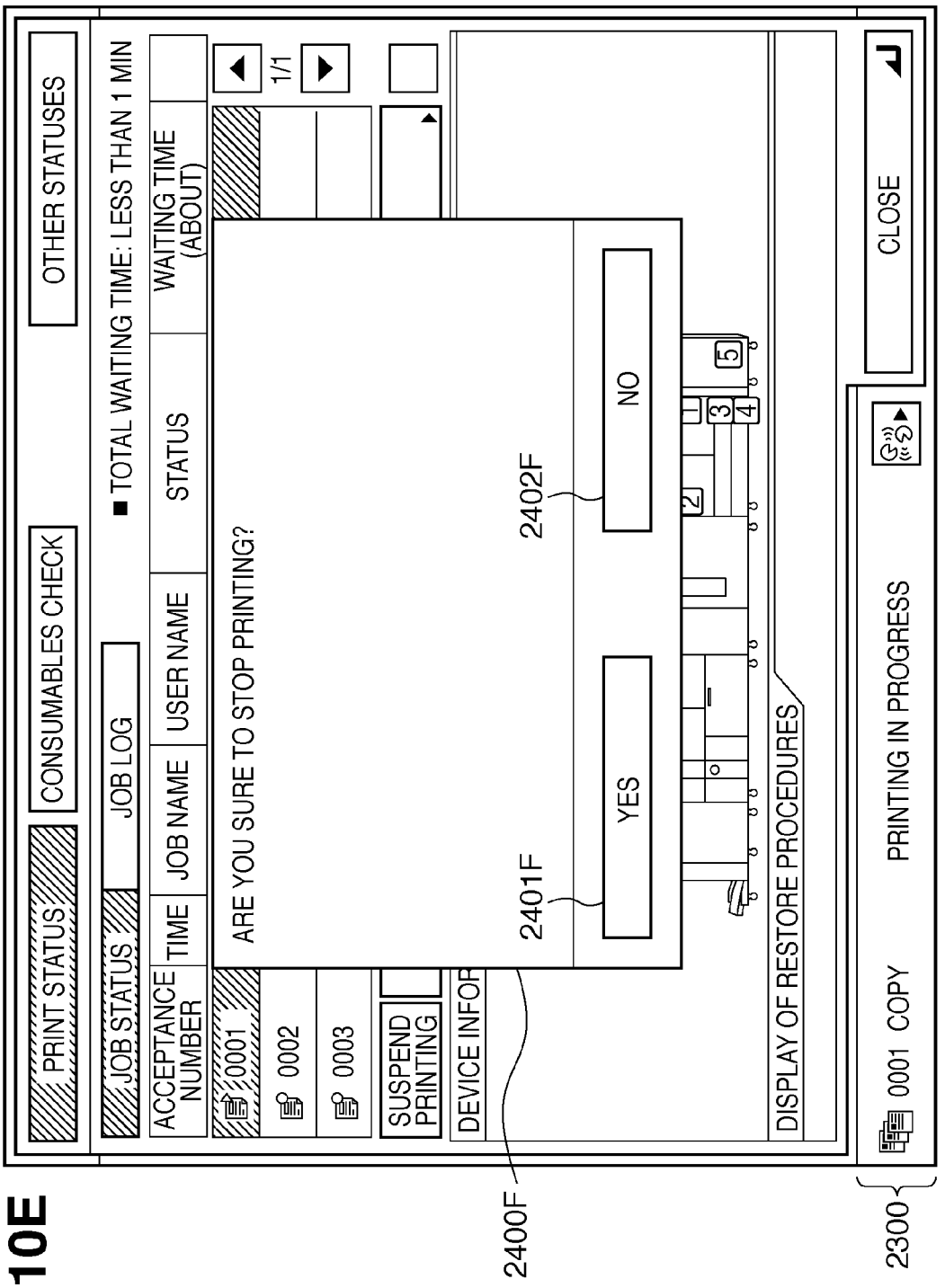

PRINT STATUS
CONSUMABLES CHECK
OTHER STATUSES
JOB STATUS
JOB LOG
■ TOTAL WAITING TIME: LESS THAN 1 MIN
ACCEPTANCE NUMBER
TIME
JOB NAME
USER NAME
STATUS
WAITING TIME (ABOUT)
0001
0002
0003
1/1
SUSPEND PRINTING
DEVICE INFOR
ARE YOU SURE TO STOP PRINTING?
YES
NO
2401F
2402F
2400F
DISPLAY OF RESTORE PROCEDURES
CLOSE
0001 COPY
PRINTING IN PROGRESS
2300

FIG. 11A

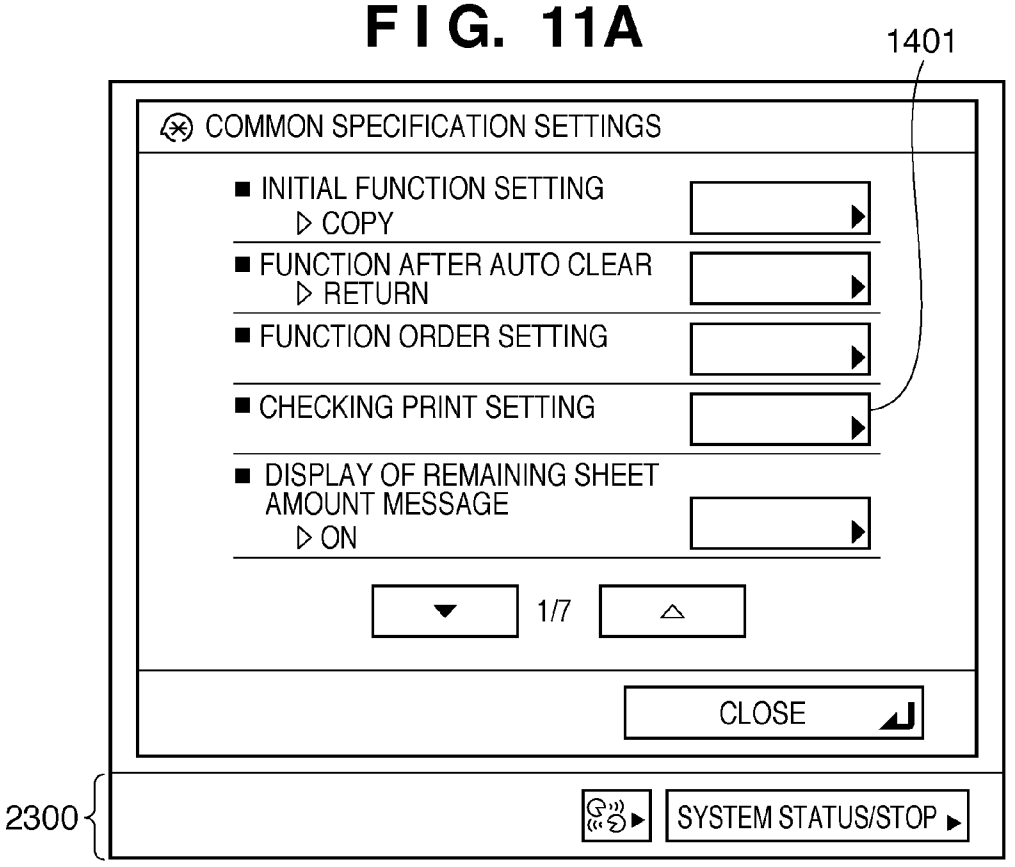


FIG. 11B

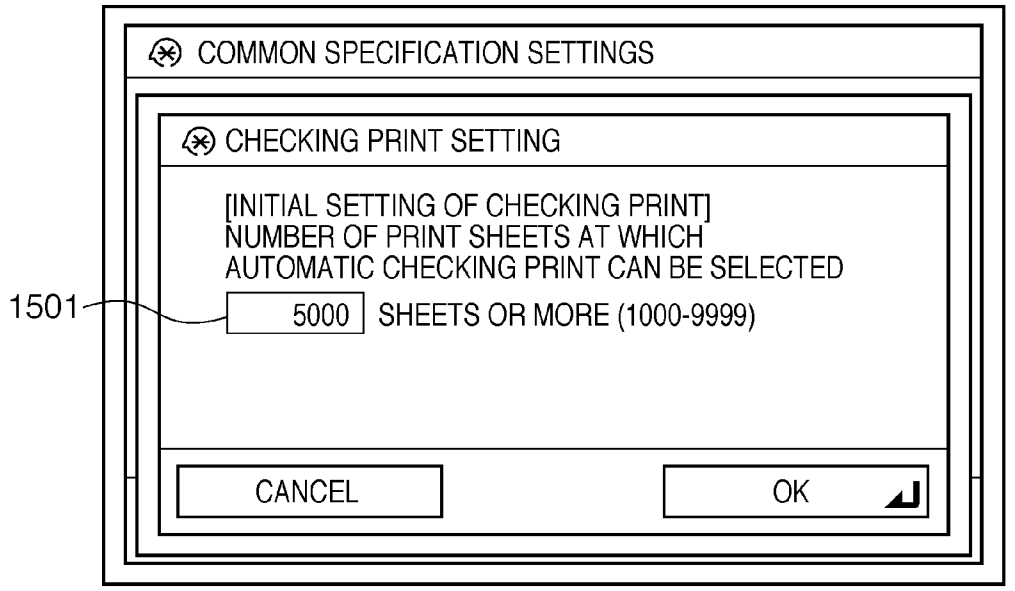


FIG. 12

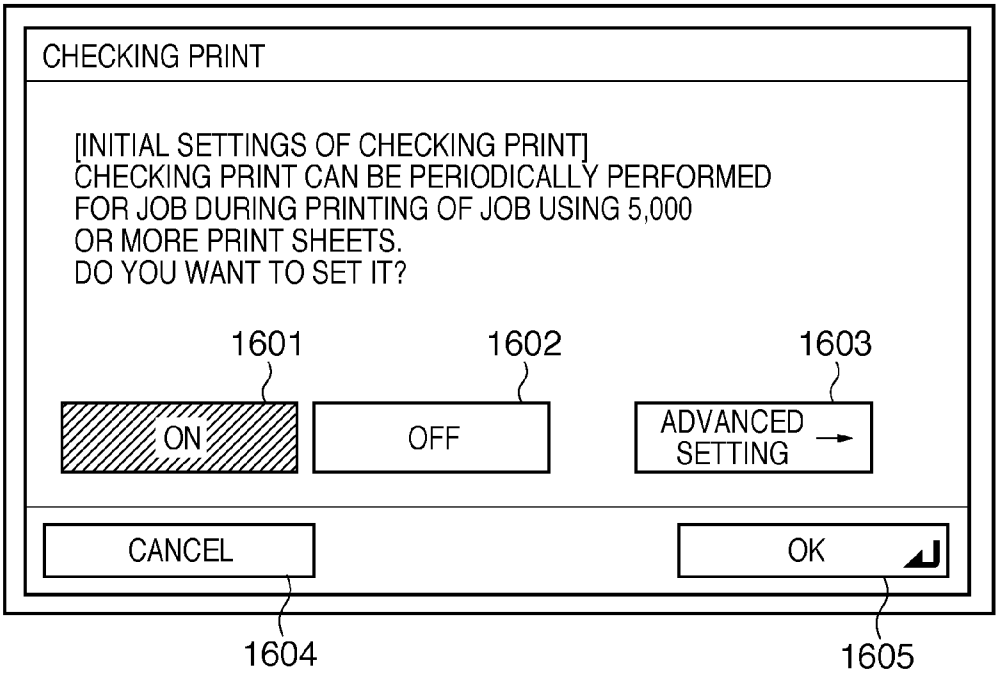

CHECKING PRINT
[INITIAL SETTINGS OF CHECKING PRINT]
CHECKING PRINT CAN BE PERIODICALLY PERFORMED
FOR JOB DURING PRINTING OF JOB USING 5,000
OR MORE PRINT SHEETS.
DO YOU WANT TO SET IT?
1601
1602
1603
ON
OFF
ADVANCED SETTING
CANCEL
OK
1604
1605

FIG. 13A

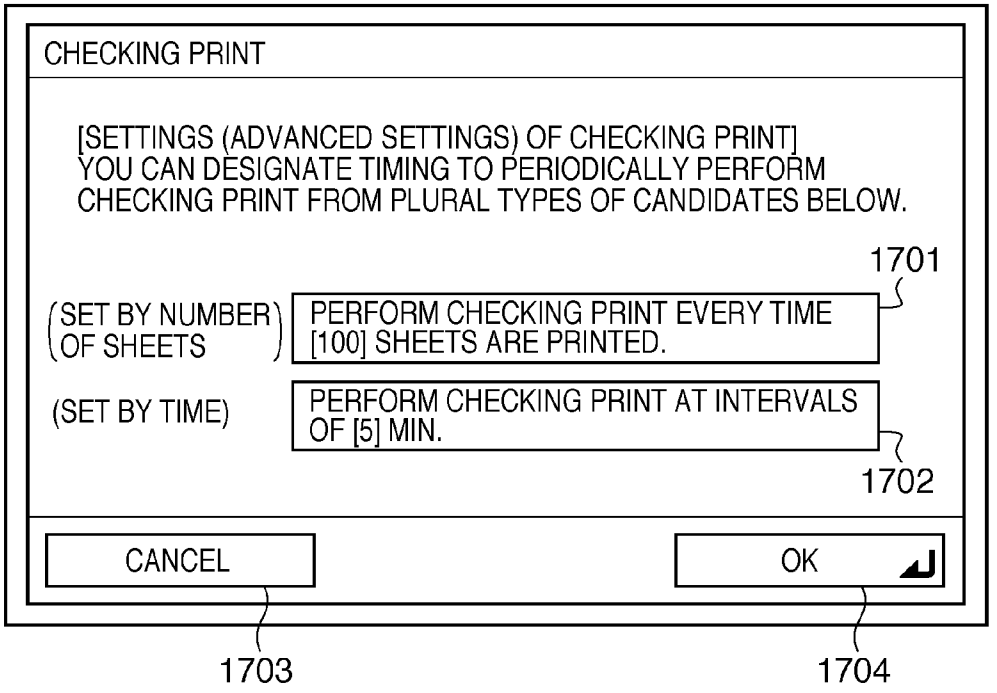


FIG. 13B

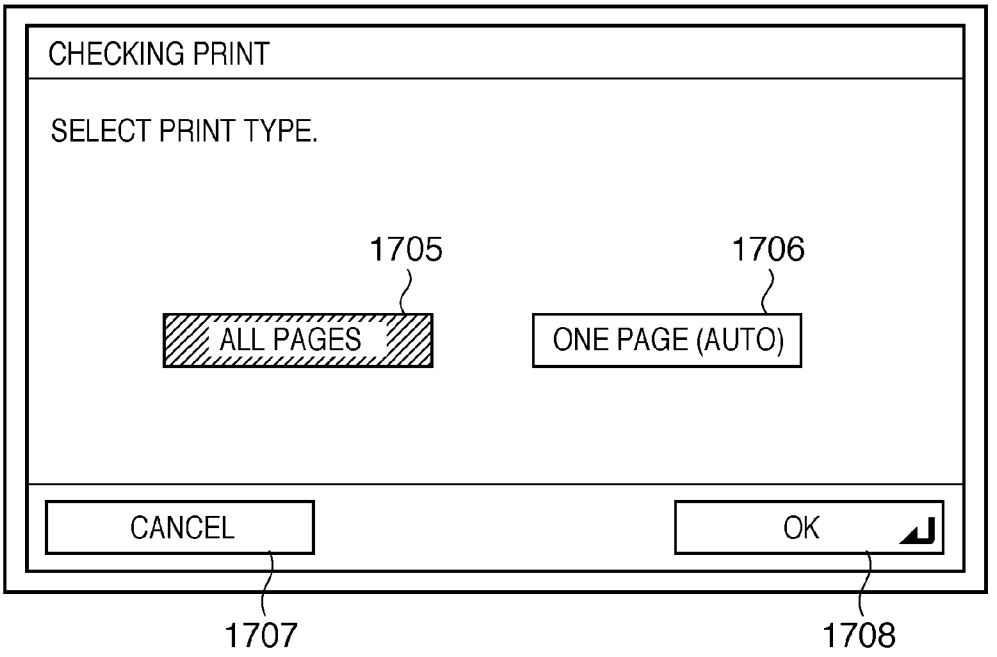


FIG. 14

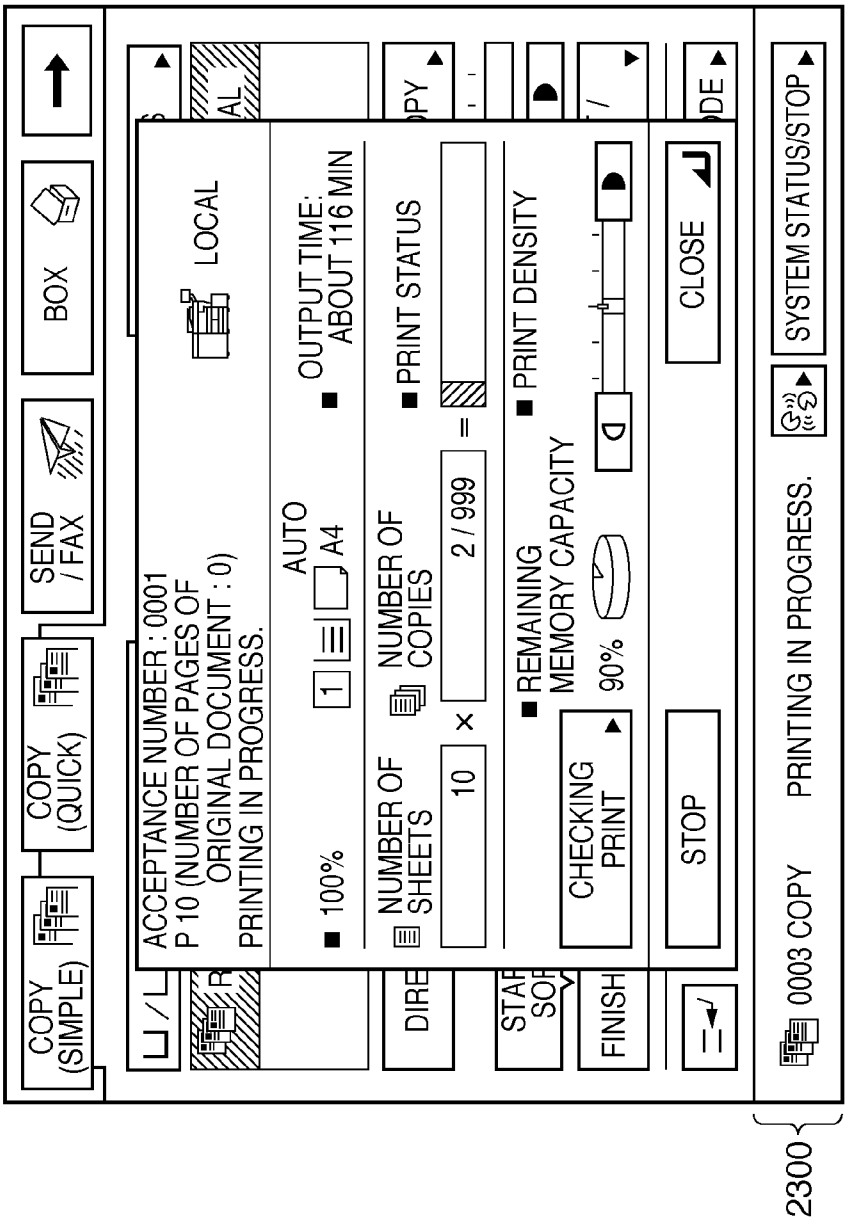

COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
ACCEPTANCE NUMBER : 0001
P 10 (NUMBER OF PAGES OF ORIGINAL DOCUMENT : 0)
PRINTING IN PROGRESS.
LOCAL
AUTO
100%
A4
OUTPUT TIME: ABOUT 116 MIN
NUMBER OF SHEETS
10
NUMBER OF COPIES
2 / 999
PRINT STATUS
REMAINING MEMORY CAPACITY
90%
PRINT DENSITY
CHECKING PRINT
STOP
CLOSE
0003 COPY
PRINTING IN PROGRESS.
SYSTEM STATUS/STOP
2300

FIG. 15

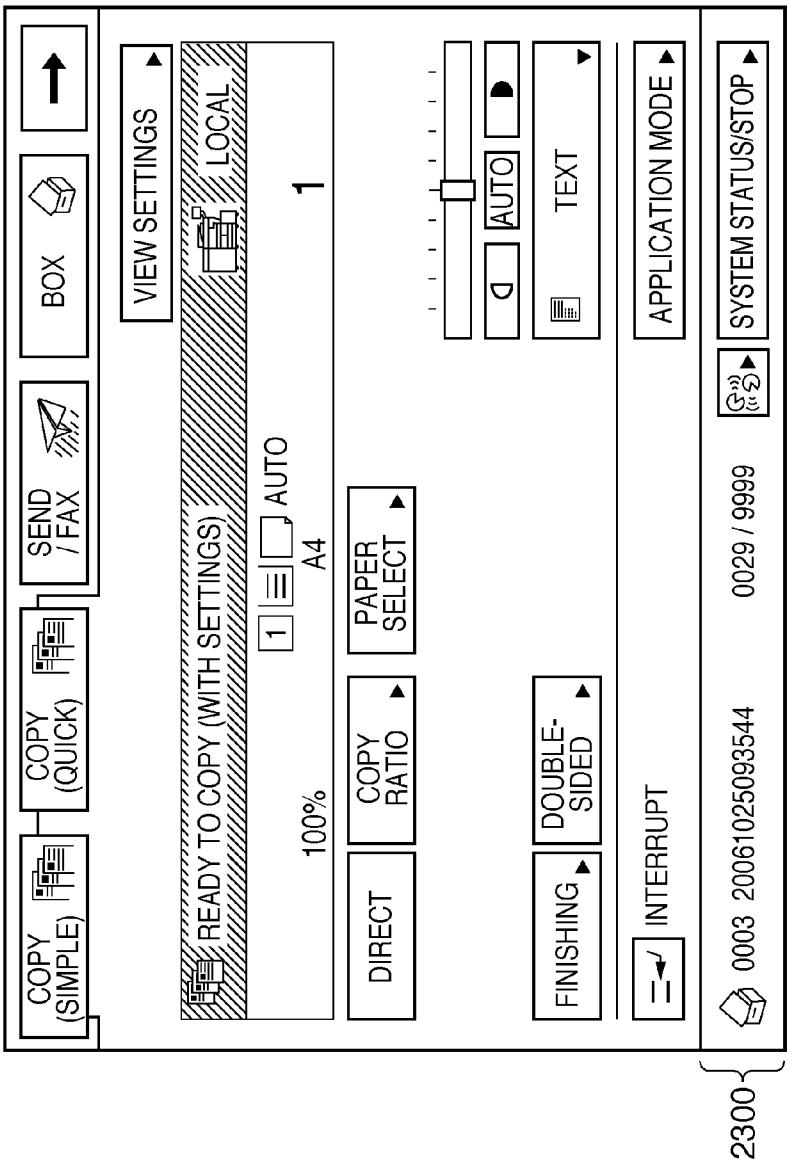

COPY (SIMPLE)
COPY (QUICK)
SEND / FAX
BOX
VIEW SETTINGS
READY TO COPY (WITH SETTINGS)
LOCAL
1
AUTO
A4
100%
DIRECT
COPY RATIO
PAPER SELECT
FINISHING
DOUBLE-SIDED
AUTO
TEXT
INTERRUPT
APPLICATION MODE
0003 2006102509354 4
0029 / 9999
SYSTEM STATUS/STOP
2300

FIG. 16A

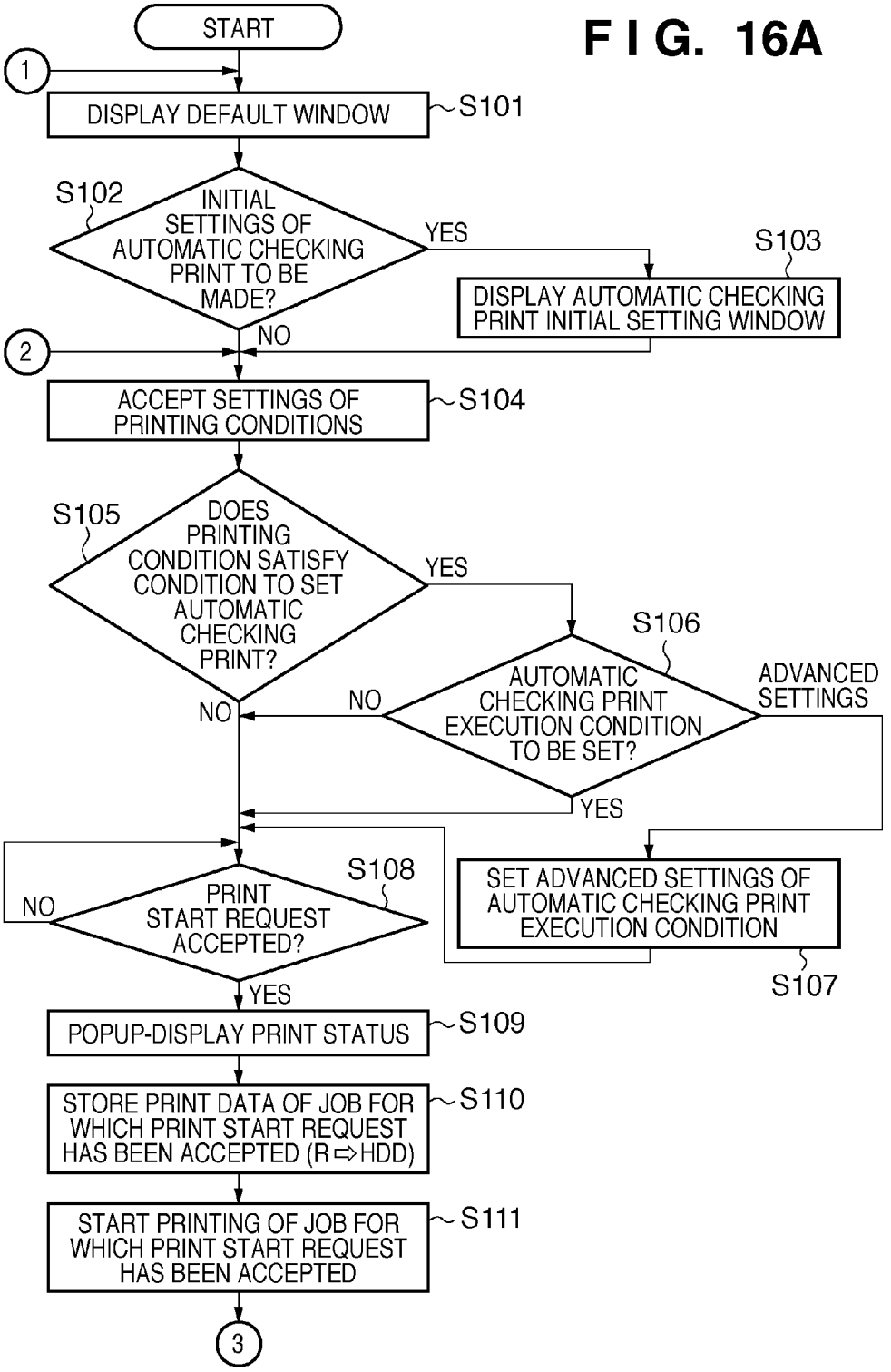

START
1
DISPLAY DEFAULT WINDOW
S101
S102
INITIAL SETTINGS OF AUTOMATIC CHECKING PRINT TO BE MADE?
YES
S103
DISPLAY AUTOMATIC CHECKING PRINT INITIAL SETTING WINDOW
NO
2
ACCEPT SETTINGS OF PRINTING CONDITIONS
S104
S105
DOES PRINTING CONDITION SATISFY CONDITION TO SET AUTOMATIC CHECKING PRINT?
YES
S106
AUTOMATIC CHECKING PRINT EXECUTION CONDITION TO BE SET?
ADVANCED SETTINGS
NO
NO
YES
S108
PRINT START REQUEST ACCEPTED?
NO
YES
SET ADVANCED SETTINGS OF AUTOMATIC CHECKING PRINT EXECUTION CONDITION
S107
POPUP-DISPLAY PRINT STATUS
S109
STORE PRINT DATA OF JOB FOR WHICH PRINT START REQUEST HAS BEEN ACCEPTED (R⇨HDD)
S110
START PRINTING OF JOB FOR WHICH PRINT START REQUEST HAS BEEN ACCEPTED
S111
3

FIG. 16B

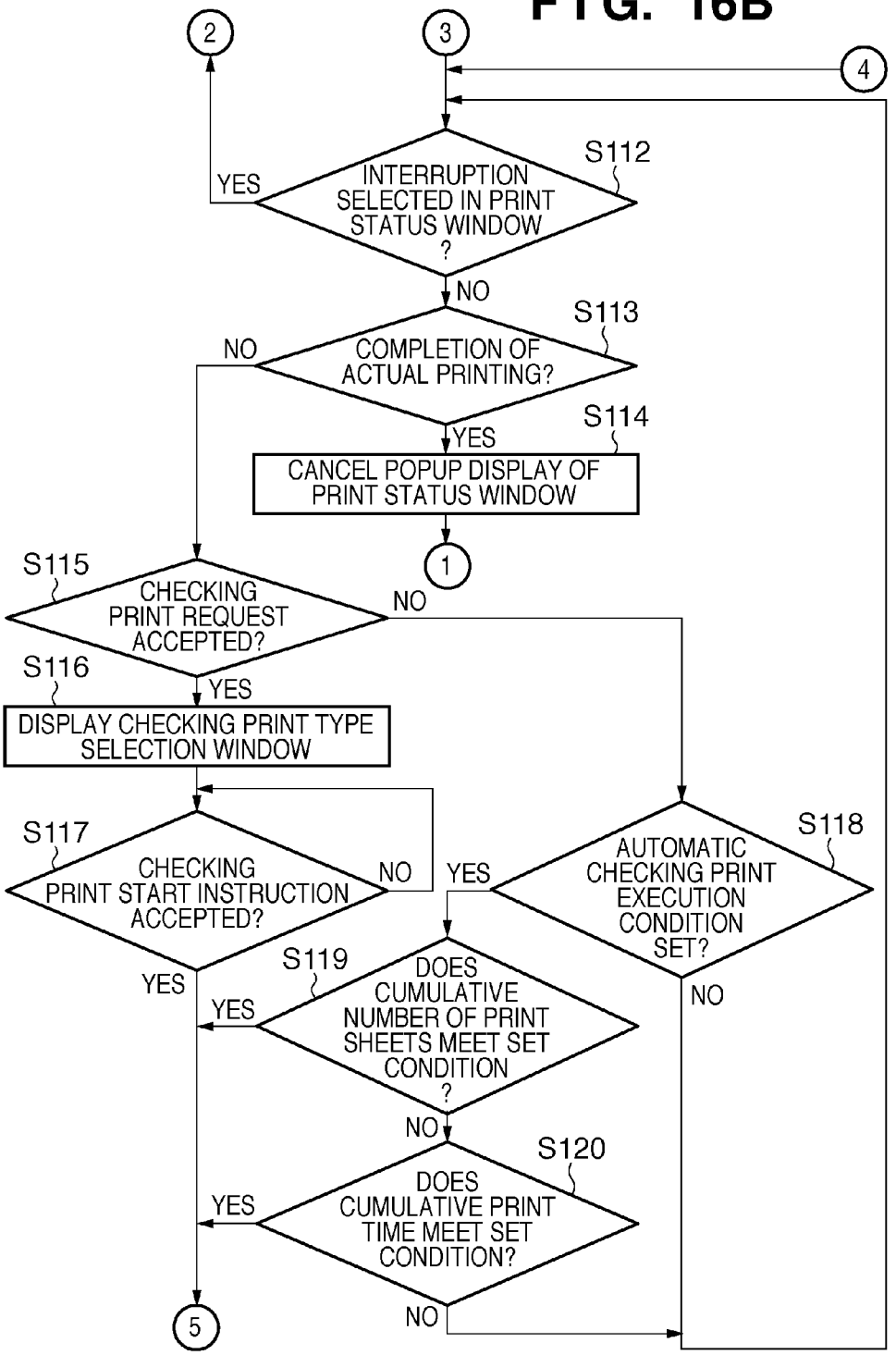
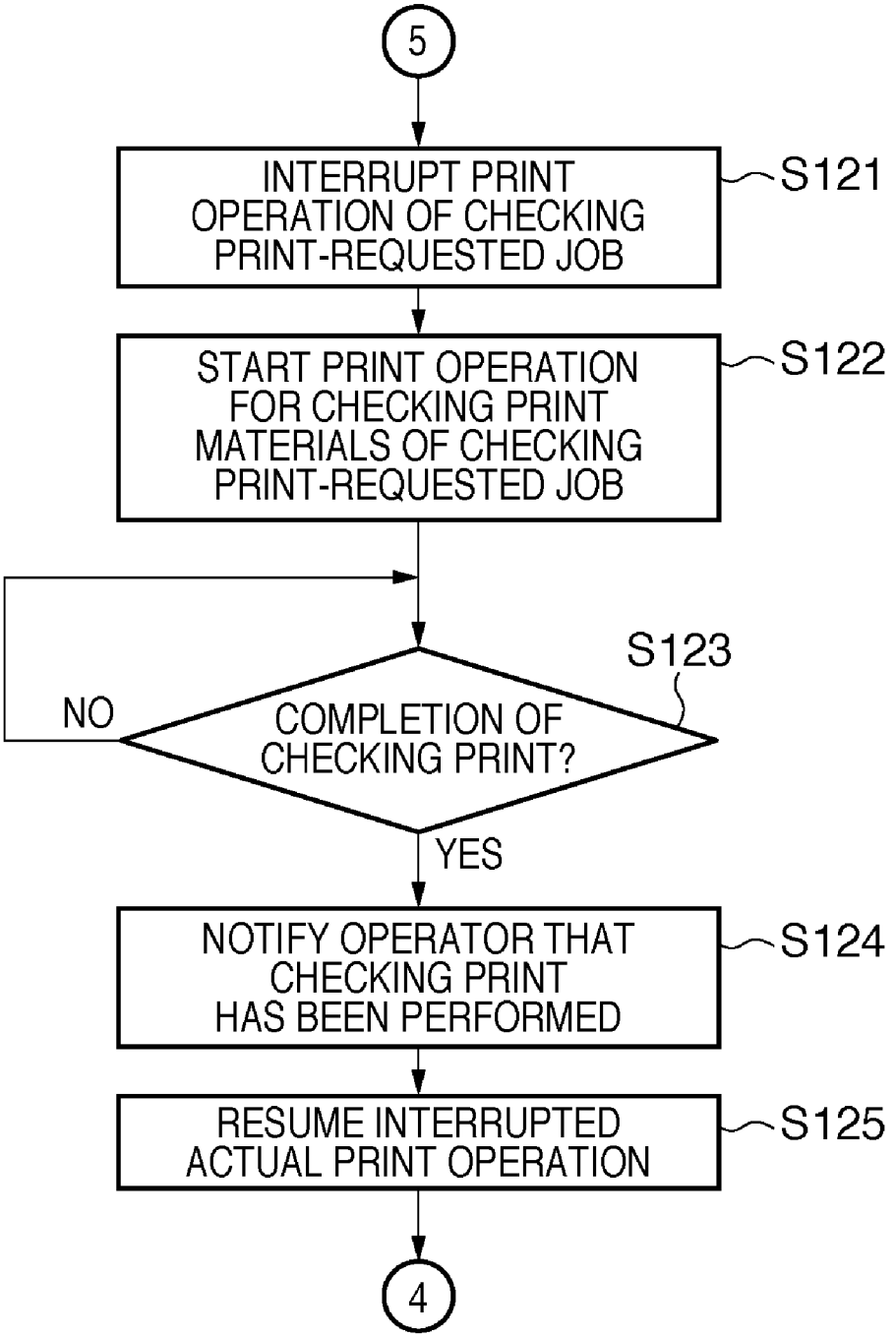

2
3
4
S112
INTERRUPTION SELECTED IN PRINT STATUS WINDOW ?
YES
NO
S113
COMPLETION OF ACTUAL PRINTING?
NO
YES
S114
CANCEL POPUP DISPLAY OF PRINT STATUS WINDOW
1
S115
CHECKING PRINT REQUEST ACCEPTED?
NO
S116
YES
DISPLAY CHECKING PRINT TYPE SELECTION WINDOW
S117
CHECKING PRINT START INSTRUCTION ACCEPTED?
NO
YES
S118
AUTOMATIC CHECKING PRINT EXECUTION CONDITION SET?
YES
NO
S119
DOES CUMULATIVE NUMBER OF PRINT SHEETS MEET SET CONDITION ?
YES
NO
S120
DOES CUMULATIVE PRINT TIME MEET SET CONDITION?
YES
NO
5

FIG. 16C


5
INTERRUPT PRINT OPERATION OF CHECKING PRINT-REQUESTED JOB
S121
START PRINT OPERATION FOR CHECKING PRINT MATERIALS OF CHECKING PRINT-REQUESTED JOB
S122
S123
NO
COMPLETION OF CHECKING PRINT?
YES
NOTIFY OPERATOR THAT CHECKING PRINT HAS BEEN PERFORMED
S124
RESUME INTERRUPTED ACTUAL PRINT OPERATION
S125
4

PRINTING SYSTEM, CONTROLLING METHOD, PRINTING APPARATUS, AND STORAGE MEDIUM

BACKGROUND OF THE INVENTION

[0001] 1. Field of the Invention

[0002] The present invention relates to a printing system, controlling method, printing apparatus, and storage medium.

[0003] 2. Description of the Related Art

[0004] In a conventional printing industry, an offset reproduction printing press has been used in printing processing, so the block copy preparation process is indispensable. However, once the block copy is prepared, it is difficult to correct the block copy, and correcting the block copy raises the cost. Hence, the block copy preparation requires careful proofreading (i.e., careful layout check and color confirmation), and it takes time to issue publications.

[0005] In this situation, POD (Print On Demand) printing systems using electrophotographic and inkjet printing apparatuses have been proposed recently (see patent references 1 and 2).

[0006] The POD printing system can omit the block copy preparation and other cumbersome work processes.

[0007] [Patent Reference 1]

[0008] Japanese Patent Laid-Open No. 2004-310746

[0009] [Patent Reference 2]

[0010] Japanese Patent Laid-Open No. 2004-310747

[0011] However, there is room for further study in commercializing the POD printing system.

[0012] Assume that the printing company or the like uses the POD printing system. In this printing environment, it is important to efficiently create customer-satisfactory print materials as many as possible in a short period.

[0013] In this printing environment, it is expected that the operator at the printing site needs to check whether the printing system outputs print materials which satisfy the customer. It is also expected that the printing system needs to continuously operate without unnecessarily stopping the print operation of the printing system.

[0014] Considering these requirements, there will be a need to check print materials in the above-described way without unnecessarily stopping the print operation of the printing system. In the future, the following need will arise. That is, the operator wants a print unit to perform printing automatically by a print checking function on condition that a job to be printed satisfies a condition to cause the print unit to perform printing automatically using the checking print function available to check printing results and/or change printing conditions. However, a mechanism which meets this need has not been proposed at present.

SUMMARY OF THE INVENTION

[0015] The present invention has been made to overcome the conventional drawbacks. That is, it is an object of the present invention to build a user-friendly printing environment capable of effectively using a checking print without unnecessarily bothering the operator.

[0016] According to the first aspect of the present invention, there is provided a printing system comprising: a receiver adapted to receive a predetermined user's instruction via a user interface, the predetermined user's instruction being adapted to request a checking print, the checking print being adapted to perform at least one of checking of a printing result and changing of a printing condition; and a controller adapted to cause a printer to perform the checking print for a job in a case that the predetermined user's instruction is received via the user interface, wherein the controller is adapted to cause the printer to perform the checking print for the job without receiving the predetermined user's instruction via the user interface in a case that the job meets a predetermined condition, the predetermined condition being adapted to cause the printer to perform the checking print automatically.

[0017] According to the second aspect of the present invention, there is provided a printing apparatus which can be adapted to the printing system of the first aspect, the apparatus comprising the printer, the receiver, and the controller.

[0018] According to the third aspect of the present invention, there is provided a controlling method adapted to a printing system configured to cause a printer to perform a checking print, the checking print being adapted to perform at least one of checking of a printing result and changing of a printing condition, the method comprising: causing the printer to perform the checking print for a job in a case that a predetermined user's instruction is received via a user interface, the predetermined user's instruction being adapted to request the checking print; and causing the printer to perform the checking print for the job without receiving the predetermined user's instruction via the user interface in a case that the job meets a predetermined condition, the predetermined condition being adapted to cause the printer to perform the checking print automatically.

[0019] Further features of the present invention will become apparent from the following description of exemplary embodiments with reference to the attached drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] FIG. **1** is a view showing an example of the configuration of a POD system **10000**;

[0021] FIG. **2** is a block diagram for explaining an example of the internal configuration of a printing system **1000**;

[0022] FIG. **3** is a sectional view of a printing apparatus **100** and a sheet processing apparatus **200** connected to the printing apparatus **100**;

[0023] FIG. **4** is a sectional view showing an example of the internal structure of a large-volume stacker;

[0024] FIG. **5** is a view showing an example of an operation unit **204**;

[0025] FIG. **6** is a view showing a display example of a setup window for prompting the user to select the type of sheet processing to be performed for sheets printed by the printing apparatus **100**;

[0026] FIG. **7** is a view showing a display example of a setup window configured to allow the user to register information for specifying, e.g., the number, types, and connection order of sheet processing apparatuses in the case where the sheet processing apparatuses **200** are connected to the printing apparatus **100**;

[0027] FIG. **8** is a timing chart;

[0028] FIG. **9**A is a view showing an example of a user interface window;

[0029] FIG. **9**B is a view showing an example of a user interface window;

[0030] FIG. **9**C is a view showing an example of a user interface window;

[0031] FIG. **9**D is a view showing an example of a user interface window;

[0032] FIG. **9**E is a view showing an example of a user interface window;

[0033] FIG. **9**F is a view showing an example of a user interface window;

[0034] FIG. **10**A is a view showing an example of a user interface window;

[0035] FIG. **10**B is a view showing an example of a user interface window;

[0036] FIG. **10**C is a view showing an example of a user interface window;

[0037] FIG. **10**D is a view showing an example of a user interface window;

[0038] FIG. **10**E is a view showing an example of a user interface window;

[0039] FIG. **11**A is a view showing an example of a user interface window;

[0040] FIG. **11**B is a view showing an example of a user interface window;

[0041] FIG. **12** is a view showing an example of a user interface window;

[0042] FIG. **13**A is a view showing an example of a user interface window;

[0043] FIG. **13**B is a view showing an example of a user interface window;

[0044] FIG. **14** is a view showing an example of a user interface window;

[0045] FIG. **15** is a view showing an example of a user interface window; and

[0046] FIGS. **16**A, **16**B, and **16**C are flowcharts each showing the process of a checking print operation performed by a control unit **205**.

DESCRIPTION OF THE EMBODIMENTS

[0047] Preferred embodiments of the present invention will be described in detail with reference to the accompanying drawings. These embodiments are merely examples of a preferred configuration of the present invention set forth in the following claims, and the present invention is not limited to these embodiments.

[0048] A POD system **10000** in FIG. **1** comprises a printing system **1000**, scanner **102**, server computer **103** (PC **103**), and client computer **104** (PC **104**), which are connected via a network **101**. The POD system **10000** also comprises a paper folding apparatus **107**, sheet cutting device **109**, saddle stitching apparatus **110**, case binding apparatus **108**, and the like.

[0049] As shown in FIG. **2**, the printing system **1000** comprises a printing apparatus **100** and sheet processing apparatus **200**. As the printing apparatus **100**, the embodiment will exemplify a MFP (Multi Function Peripheral) having a plurality of functions such as the copy function and printer function. However, the printing apparatus **100** may also be a single function type printing apparatus having only the copy function or printer function.

[0050] The PC **103** manages data transmission/reception to/from a variety of apparatuses connected to the network **101**. The PC **104** transmits image data to the printing apparatus **100** and PC **103** via the network **101**. The paper folding apparatus **107** folds sheets printed by the printing apparatus **100**. The case binding apparatus **108** case-binds sheets printed by the printing apparatus **100**. The sheet cutting device **109** cuts each bundle of sheets printed by the printing apparatus **100**. The saddle stitching apparatus **110** saddle-stitches sheets printed by the printing apparatus **100**.

[0051] In the use of the paper folding apparatus **107**, case binding apparatus **108**, sheet cutting device **109**, and saddle stitching apparatus **110**, the user takes sheets printed by the printing apparatus **100** out of the printing system **1000**, sets them in an apparatus for use, and causes the apparatus to process the sheets. A plurality of apparatuses in the POD system **10000** of FIG. **1** except the saddle stitching apparatus **110** are connected to the network **101** and can communicate data with each other.

[0052] The configuration of the printing system **1000** will be explained with reference to the system block diagram of FIG. **2**.

[0053] The printing apparatus **100** incorporates units shown in FIG. **2** in the printing system **1000** except the sheet processing apparatus **200**. The printing apparatus **100** allows connecting an arbitrary number of sheet processing apparatuses **200**.

[0054] The printing system **1000** is configured to allow the sheet processing apparatus **200** connected to the printing apparatus **100** to perform sheet processing for sheets printed by the printing apparatus **100**. The printing system **1000** can also be built from only the printing apparatus **100** without connecting the sheet processing apparatus **200**.

[0055] The sheet processing apparatus **200** is configured to be communicable with the printing apparatus **100**, and can perform sheet processing (to be described below) upon receiving an instruction from the printing apparatus **100**. A scanner unit **201** scans an image on an original document, converts it into image data, and transfers the image data to another unit. An external I/F **202** transmits/receives data between the printing apparatus **100** and other apparatuses connected to the network **101**. A printer unit **203** prints an image based on input image data on a sheet. An operation unit **204** comprises a hard key input section (key input section) **402** and touch panel section **401** (to be described later), and accepts an instruction from the user via them. The operation unit **204** presents various displays on the touch panel of the operation unit **204**.

[0056] A control unit **205** controls all the processes, operations, and the like of various units of the printing system **1000**. That is, the control unit **205** also controls the operation of the printing apparatus **100** and that of the sheet processing apparatus **200** connected to the printing apparatus **100**. A ROM **207** stores various computer programs to be performed by the control unit **205**. For example, the ROM **207** stores programs to cause the control unit **205** to perform various processes of a flowchart (to be described later), and a display control program necessary to display various setup windows (to be described later). The ROM **207** also stores a program to cause the control unit **205** to analyze PDL (Page Description Language) code data received from the PC **103**, PC **104**, or the like, and rasterize it into raster image data. In addition, the ROM **207** stores a boot sequence, font information, and the like. A RAM **208** stores image data sent from the scanner unit **201** and external I/F **202**, various programs loaded from the ROM **207**, and setting information. The RAM **208** also stores information on the sheet processing apparatus **200** (e.g., the number of (0 to n) sheet processing apparatuses **200** connected to the printing apparatus **100**, information on the functions of each sheet processing apparatus **200**, and the connection order of the sheet processing apparatuses **200**).

[0057] An HDD (Hard Disk Drive) **209** includes a hard disk, and a driving unit for reading/writing data from/in the hard disk. The HDD **209** is a large-capacity storage device

which stores image data that is input from the scanner unit **201** or external I/F **202** and compressed by a compression/decompression unit **210**. The control unit **205** can cause the printer unit **203** to print image data stored in the HDD **209** on the basis of an instruction from the user. The control unit **205** can also transmit image data stored in the HDD **209** to an external apparatus such as the PC **103** via the external I/F **202** on the basis of an instruction from the user.

[0058] The compression/decompression unit **210** compresses/decompresses image data and the like stored in the RAM **208** and HDD **209** according to various compression schemes such as JBIG and JPEG.

[0059] The configuration of the printing system **1000** will be explained with reference to FIG. **3**. FIG. **3** is a sectional view of the printing apparatus **100** and the sheet processing apparatuses **200** connected to the printing apparatus **100**.

[0060] An auto document feeder (ADF) **301** separates a bundle of original document sheets set on the support surface of the document tray in the order of pages from the first page, and feeds each original document sheet to the original table glass in order to scan it by a scanner **302**.

[0061] The scanner **302** scans the image of the original document sheet fed onto the original table glass, and converts the image into image data by a CCD. A light ray (e.g., a laser beam) modulated in accordance with the image data strikes a rotary polygon mirror **303**, and irradiates a photosensitive drum **304** as a reflected scan beam via a reflecting mirror. A latent image formed by the laser beam on the photosensitive drum **304** is developed with toner. The toner image is transferred onto a sheet material supported on a transfer drum **305**. A series of image forming processes is executed sequentially with yellow (Y), magenta (M), cyan (C), and black (K) toners, forming a full-color image. After four image forming processes, the sheet material bearing the full-color image is separated from the transfer drum **305** by a separation gripper **306**, and conveyed to a fixing unit **308** by a pre-fixing conveyor **307**. The fixing unit **308** has a combination of rollers and belts, and incorporates a heat source such as a halogen heater. The fixing unit **308** fuses and fixes, by heat and pressure, toner on a sheet material bearing a toner image. A delivery flapper **309** is swingable about the swing shaft, and regulates the sheet material conveyance direction. When the delivery flapper **309** swings clockwise in FIG. **3**, a sheet material is conveyed straight, and discharged outside the apparatus by delivery rollers **310**.

[0062] The control unit **205** controls the printing apparatus **100** to perform single-sided printing according to this sequence.

[0063] To form images on the two surfaces of a sheet material, the delivery flapper **309** swings counterclockwise in FIG. **3**. The course of the sheet material changes downward to supply the sheet material to the double-sided conveyor. The double-sided conveyor comprises a reverse flapper **311**, reverse rollers **312**, reverse guide **313**, and double-sided tray **314**. The reverse flapper **311** swings about the swing shaft, and regulates the sheet material conveyance direction. To process a double-sided print job, the control unit **205** controls to swing the reverse flapper **311** counterclockwise in FIG. **3** and supply a sheet having the first surface printed by the printer unit **203** to the reverse guide **313** via the reverse rollers **312**. While the reverse rollers **312** clamp the trailing end of the sheet material, the reverse rollers **312** temporarily stop, the reverse flapper **311** swings clockwise in FIG. **3**, and the reverse rollers **312** rotate backward. The sheet is switched back to replace its trailing and leading ends, and then the sheet is guided to the double-sided tray **314**. The double-sided tray **314** temporarily supports the sheet material, and a refeed roller **315** supplies the sheet material again to registration rollers **316**. At this time, the sheet material is sent with a surface opposite to the first surface in the transfer step facing the photosensitive drum **304**. The second image is formed on the second surface of the sheet by the same processing as that described above. After the images are formed on the two surfaces of the sheet material, the sheet undergoes the fixing step and is discharged from inside the main body of the printing apparatus **100** to outside it via the delivery rollers **310**. The control unit **205** controls the printing apparatus **100** to perform double-sided printing according to this sequence.

[0064] The printing apparatus **100** also comprises paper feed units for storing sheets necessary for print processing. The paper feed units are, for example, paper cassettes **317** and **318** (each capable of storing, e.g., 500 sheets), a paper deck **319** (capable of storing, e.g., 5,000 sheets), and a manual feed tray **320**. The paper cassettes **317** and **318** and the paper deck **319** allow setting sheets of different sizes and materials in distinction from each other in the paper feed units. The manual feed tray **320** allows setting a variety of sheets including a special sheet such as an OHP sheet. The paper cassettes **317** and **318**, paper deck **319**, and manual feed tray **320** respectively have pickup rollers, and the pickup rollers successively feed sheets one by one.

[0065] The sheet processing apparatuses **200** shown in FIG. **3** will be explained.

[0066] In the printing system **1000** according to the embodiment, an arbitrary number of sheet processing apparatuses **200** of arbitrary types can be coupled as long as they can convey sheets from an upstream apparatus to a downstream apparatus via a sheet feeding path. For example, as shown in FIG. **3**, a large-volume stacker **200-3***a*, glue binding apparatus **200-3***b*, and saddle stitching apparatus **200-3***c* can be coupled in the order named from a side close to the printing apparatus **100**, and selectively used in the printing system **1000**. Each sheet processing apparatus **200** has a sheet discharge portion, and the user can take processed sheets out of the sheet discharge portion of the sheet processing apparatus.

[0067] The control unit **205** accepts, via the operation unit **204** together with a print execution request, a request to perform sheet processing of a type the user wants among a plurality of types of sheet processing candidates executable by the sheet processing apparatuses **200** connected to the printing apparatus **100**. Upon accepting the print execution request from the user via the operation unit **204** for a target job, the control unit **205** causes the printer unit **203** to perform print processing necessary for the job. The control unit **205** controls to convey sheets of the job having undergone print processing via the sheet feeding path to a sheet processing apparatus capable of performing sheet processing the user wants, and causes the sheet processing apparatus to perform the sheet processing.

[0068] Assume that a target job, for which a print execution request has been accepted from the user, instructs the large-volume stacker **200-3***a* to perform large-volume stacking when the printing system **1000** has the system configuration shown in FIG. **3**. This job is called a "stacker job".

[0069] When processing the stacker job in the system configuration of FIG. **3**, the control unit **205** makes sheets of the job printed by the printing apparatus **100** pass through point A in FIG. **3**, and conveys them into the large-volume stacker

200-3*a*. Then, the control unit **205** causes the large-volume stacker **200-3***a* to perform stacking of the job. The control unit **205** causes the large-volume stacker **200-3***a* to hold the print materials of the job stacked in the large-volume stacker **200-3***a* at a delivery destination X inside the large-volume stacker **200-3***a* without conveying the print materials to another apparatus (e.g., a succeeding apparatus).

[0070] The user can directly take out, from the delivery destination X, the print materials of the stacker job held at the delivery destination X in FIG. **3**. This can omit a series of apparatus operations and user operations to convey sheets to a most downstream delivery destination Z in the sheet conveyance direction in FIG. **3** and take out the print materials of the stacker job from the delivery destination Z.

[0071] Assume that a target job, for which a print execution request has been accepted from the user, instructs the glue binding apparatus **200-3***b* to perform sheet processing (e.g., glue binding of either case binding or pad binding) in the system configuration of FIG. **3**. This job is called a "glue binding job".

[0072] When processing the glue binding job in the system configuration of FIG. **3**, the control unit **205** conveys sheets printed by the printing apparatus **100** into the glue binding apparatus **200-3***b* via points A and B in FIG. **3**. Then, the control unit **205** causes the glue binding apparatus **200-3***b* to perform glue binding of the job. The control unit **205** causes the glue binding apparatus **200-3***b* to hold, at a delivery destination Y inside the glue binding apparatus **200-3***b*, the print materials of the job having undergone glue binding by the glue binding apparatus **200-3***b*, without conveying the print materials to another apparatus (e.g., a succeeding apparatus).

[0073] Assume that a target job, for which a print execution request has been accepted from the user, requires sheet processing by the saddle stitching apparatus **200-3***c* in the system configuration of FIG. **3**. Sheet processing by the saddle stitching apparatus **200-3***c* includes, e.g., saddle stitching, punching, cutting, shift delivery, and folding. This job is called a "saddle stitching job".

[0074] When processing the saddle stitching job in the system configuration of FIG. **3**, the control unit **205** makes sheets of the job printed by the printing apparatus **100** pass through points A, B, and C, and conveys them to the saddle stitching apparatus **200-3***c*. Then, the control unit **205** causes the saddle stitching apparatus **200-3***c* to perform sheet processing of the job. The control unit **205** causes the saddle stitching apparatus **200-3***c* to hold, at the delivery destination Z of the saddle stitching apparatus **200-3***c*, the print materials of the saddle stitching job having undergone the sheet processing by the saddle stitching apparatus **200-3***c*.

[0075] The delivery destination Z has a plurality of delivery destination candidates. These delivery destination candidates are used to change the delivery destination for each sheet process because the saddle stitching apparatus **200-3***c* can perform a plurality of types of sheet processes.

[0076] As described with reference to FIGS. **1** to **3**, the printing system **1000** according to the embodiment allows connecting a plurality of sheet processing apparatuses to the printing apparatus **100**. An arbitrary combination of sheet processing apparatuses can be connected to the printing apparatus **100**. The connection order of sheet processing apparatuses is also freely changeable as long as their sheet feeding paths communicate with each other. Also, there are a plurality of types of sheet processing apparatus candidates connectable to the printing apparatus **100**.

[0077] The internal structure of a large-volume stacker applicable as the sheet processing apparatus **200** will be explained with reference to the sectional view shown in FIG. **4**. In the embodiment, the large-volume stacker functions as a specific type of post processing apparatus configured to stack print materials obtained by printing by a checking print function (to be described later). The large-volume stacker conveys sheets from an upstream apparatus selectively to three feeding paths: a sample tray path, stack path, and straight path.

[0078] The stack path in the large-volume stacker is a sheet feeding path for conveying sheets to the stack tray. The stack tray in FIG. **4** is a stacking unit mounted on an extensible stay or the like. A detachable dolly supports the extensible stay from below it. By using the dolly, the operator can carry sheets stacked on the stack tray.

[0079] Assume that the control unit **205** accepts a request from the user via the operation unit **204** to perform a job set to stack sheets on the large-volume stacker. In this case, the control unit **205** conveys sheets printed by the printing apparatus **100** to the stack path of the large-volume stacker, and delivers them to the stack tray via the stack path.

[0080] The straight path in the large-volume stacker shown in FIG. **4** is a sheet feeding path for conveying, to a succeeding apparatus, sheets of a job requiring no stacking of sheets using the stack tray of the large-volume stacker.

[0081] The sample tray path is a sheet feeding path for discharging sheets to the sample tray. The sample tray path is used to, for example, make it easy to take out outputs from the stack tray when checking them. In this case, for example, the control unit **205** conveys sheets printed by the printing apparatus **100** to the sample tray path and discharges them to the sample tray. In the embodiment, the control unit **205** controls to output print materials obtained by printing based on the checking print function to the sample tray.

[0082] Note that the sheet feeding path in the large-volume stacker has a plurality of sheet sensors necessary to detect the sheet feeding state and jam.

[0083] The large-volume stacker comprises a CPU (not shown), and notifies the control unit **205** of sheet detection information from each sensor via a signal line for communicating data. Based on the information from the large-volume stacker, the control unit **205** grasps the sheet feeding state and jam in the large-volume stacker. When another sheet processing apparatus is connected between the large-volume stacker and the printing apparatus **100**, the CPU (not shown) of this sheet processing apparatus notifies the control unit **205** of sensor information of the large-volume stacker.

[0084] The arrangement of the operation unit **204** will be described with reference to FIG. **5**.

[0085] The operation unit **204** comprises the touch panel section **401** and key input section **402**. The touch panel section **401** is formed from an LCD (Liquid Crystal Display) and a transparent electrode adhered onto the LCD, and displays various setup windows for accepting an instruction from the user. The touch panel section **401** has both a function of displaying various windows and an instruction input function of accepting an instruction from the user. The key input section **402** comprises a power key **501**, start key **503**, stop key **502**, user mode key **505**, and ten-key pad **506**. The start key **503** is used to cause the printing apparatus **100** to perform a copy job and send job. The ten-key pad **506** is used to set a numerical value such as the number of copies.

[0086] The control unit **205** controls the printing system **1000** to perform various processes based on user's instruc-

tions accepted via various windows displayed in the touch panel section **401** and user's instructions accepted via the key input section **402**.

[0087] FIG. **6** is a view showing a display example of a setup window for prompting the user to select the type of sheet processing to be performed for sheets printed by the printing apparatus **100**. When the user presses a sheet process setting key **609** shown in FIG. **5** in the window displayed in the touch panel section **401**, the control unit **205** causes the touch panel section **401** to display the window in FIG. **6**. The window in FIG. **6** is a setup window which allows the user to select the type of sheet processing executable using the sheet processing apparatus **200** in the printing system **1000**. The control unit **205** accepts, from the user via the window in FIG. **6**, settings of sheet processing to be performed for a target job, and causes the sheet processing apparatus **200** to perform the sheet processing according to the settings.

[0088] A window shown in FIG. **7** is a setup window which allows the user to register information for specifying the number, types, and connection order of sheet processing apparatuses in the case where the sheet processing apparatuses **200** are connected to the printing apparatus **100**. When the user presses the user mode key **505**, the control unit **205** controls the touch panel section **401** to be able to display the window shown in FIG. **7**.

[0089] For example, when the printing system **1000** has the system configuration as shown in FIG. **3**, the user sets registration information that three sheet processing apparatuses, i.e., a large-volume stacker, glue binding apparatus, and saddle stitching apparatus are connected to the printing apparatus **100** sequentially from the large-volume stacker, as shown in FIG. **7**. The control unit **205** causes the RAM **208** to hold, as system configuration information, the information on the sheet processing apparatuses **200** that is set by the user via the window in FIG. **7**. The control unit **205** properly reads out and refers to the system configuration information. From the system configuration information, the control unit **205** confirms the number, types, and connection order of sheet processing apparatuses connected to the printing apparatus **100**.

[0090] The printing system **1000** comprises the printing apparatus **100** having the printer unit **203** capable of printing data in the HDD **209** capable of storing data of a plurality of jobs. The printing system **1000** is configured to allow connecting the printing apparatus **100** and a plurality of sheet processing apparatuses **200**. Each of the sheet processing apparatuses **200** connectable to the printing apparatus **100** is configured to be able to perform sheet processing (also called finishing or post processing) for sheets (also called print materials or print media) of a job printed by the printer unit **203**. Each sheet processing apparatus **200** is configured to allow the operator to take out print materials having undergone sheet processing by the apparatus **200**. The printing system **1000** according to the embodiment is configured to be able to selectively supply sheets of a job printed by the printer unit **203** from the printer unit **203** to the sheet processing apparatuses **200**.

[0091] The printing apparatus **100** applied to the printing system **1000** in the embodiment has a checking print function available to check printing results and/or change printing conditions.

[0092] In the embodiment, the control unit **205** functions as a controller for causing the printer unit **203** (printer) to perform printing automatically by the checking print function.

[0093] The control unit **205** also functions as a determination unit for determining whether the job to be printed by the printer unit **203** satisfies a condition to cause the printer unit **203** to perform printing automatically by the checking print function.

[0094] Assume that the control unit **205** obtains a result of this determination that the job to be printed by the printer unit **203** satisfies the condition to cause the printer unit **203** to perform printing automatically by the checking print function.

[0095] When the job to be printed satisfies the condition to cause the printer unit **203** to perform printing automatically by the checking print function, the control unit **205** causes the printer unit **203** to perform printing automatically by the checking print function.

[0096] In this manner, the printing system **1000** according to the embodiment is configured to be able to perform printing automatically by the checking print function when the job to be printed satisfies the condition to perform printing automatically by the checking print function. The printing system **1000** has a mechanism capable of building, without unnecessarily bothering the operator, a user-friendly printing environment capable of effectively using the checking print without unnecessarily stopping the print operation of the printing system.

[0097] When performing printing by the checking print function, the control unit **205** causes the printer unit **203** to perform printing automatically by the checking print function using print data of a job to be printed by the printer unit **203**. In addition, when performing printing by the checking print function, the control unit **205** causes the printer unit **203** to perform printing automatically by the checking print function during printing of a target job. The operator can check a printing result using print data itself for actual use. Without unnecessarily stopping the print operation, the operator can easily check a parameter (e.g., print density) which changes output results as the print operation actually proceeds, as if he executed a sampling check.

[0098] As an embodiment of the above-mentioned determination, the control unit **205** in the embodiment determines whether the job to be printed by the printer unit **203** requires a predetermined number (predetermined stipulated number) or more of print media in order to complete printing.

[0099] Assume that the job to be printed by the printer unit **203** does not require a predetermined number or more of print media in order to complete printing. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to complete printing of the job without causing the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0100] Assume that the job to be printed by the printer unit **203** requires a predetermined number or more of print media in order to complete printing. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0101] The printing system **1000** having the following configuration instead of this configuration is also applicable as an embodiment of the present invention.

[0102] For example, as another embodiment of the above-mentioned determination, the control unit **205** determines whether the job to be printed by the printer unit **203** requires a predetermined time (stipulated time) or longer in order to complete printing.

[0103] Assume that the job to be printed by the printer unit **203** does not require a predetermined time or longer in order to complete printing. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to complete printing of the job without causing the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0104] Assume that the job to be printed by the printer unit **203** requires a predetermined time or longer in order to complete printing. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0105] The printing system **1000** having the following configuration instead of this configuration is also applicable as an embodiment of the present invention.

[0106] For example, as still another embodiment of the above-mentioned determination, the control unit **205** determines whether the job to be printed by the printer unit **203** needs to output print materials to a predetermined discharge destination inside a specific type of post processing apparatus. In the embodiment, a concrete example of the predetermined discharge destination inside the specific type of post processing apparatus is the stack tray in the large-volume stacker described above.

[0107] Assume that the job to be printed by the printer unit **203** need not output print materials to the predetermined discharge destination inside the specific type of post processing apparatus. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to complete printing of the job without causing the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0108] Assume that the job to be printed by the printer unit **203** needs to output print materials to the predetermined discharge destination. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0109] With this configuration, for example, when the print material delivery destination is a delivery destination exposed outside the housing of a post processing apparatus, the control unit **205** controls to inhibit performing the checking print automatically. To the contrary, when the print material delivery destination is a delivery destination incorporated in the housing of a post processing apparatus, the control unit **205** controls to perform the checking print automatically. The printing system **1000** according to the embodiment is applicable to this configuration. This can prevent a trouble that the operator cannot check print materials output to the large-volume stacker during printing using a delivery destination inside the large-volume stacker. While preventing this trouble, it is uniformly controlled not to perform the checking print automatically regardless of the delivery destination. It can be prevented to automatically perform the checking print more than necessary, and an unnecessary operation which influences productivity can be suppressed. As a result, the user friendliness of the checking print function can improve.

[0110] The printing system **1000** having the following configuration instead of this configuration is also applicable as an embodiment of the present invention.

[0111] For example, as still another embodiment of the above-mentioned determination, the control unit **205** determines whether the job to be printed by the printer unit **203** requires specific type of post processing including a plurality of steps. A concrete example of the specific type of post processing is case binding by the above-mentioned glue binding apparatus including a step of gluing the body of print materials, a step of adhering a cover, and a step of cutting an edge.

[0112] Assume that the job to be printed by the printer unit **203** does not require the specific type of post processing. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to complete printing of the job without causing the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0113] Assume that the job to be printed by the printer unit **203** requires the specific type of post processing. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0114] With this configuration, for example, when the job to be printed requires post processing including a simple work step, like a stapling job, the control unit **205** controls to inhibit performing the checking print automatically. To the contrary, when the job to be printed requires post processing using a high value-added advanced function, like the above-mentioned glue binding job, the control unit **205** controls to perform the checking print automatically. The printing system **1000** according to the embodiment is applicable to this configuration. This can improve the user friendliness of the checking print function, and prevent a trouble that print materials completed through post processing using a high value-added advanced function after considerable time and much effort provide only defective printing results.

[0115] The printing system **1000** having the following configuration instead of this configuration is also applicable as an embodiment of the present invention.

[0116] For example, as still another embodiment of the above-mentioned determination, the control unit **205** determines whether the job to be printed by the printer unit **203** requires the specific type of consumable. A concrete example of the specific type of consumable is a high value-added toner such as a toner used for color printing or a clear toner used to give glossiness. Another concrete example of the specific type of consumable is a high value-added post processing resource such as glue used for glue binding. Still another concrete example of the specific type of consumable is a high value-added print medium such as glossy paper.

[0117] Assume that the job to be printed by the printer unit **203** does not require the specific type of consumable. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to complete printing of the job without causing the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0118] Assume that the job to be printed by the printer unit **203** requires the specific type of consumable. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0119] In this configuration, assume that the job to be printed is a monochrome print job, stapling job, or a job using plain paper for printing. That is, assume that the job to be printed is a job using a consumable lower in value than that for a color print job, a glue binding job, or a job using glossy paper for printing. In this case, the control unit **205** controls to

inhibit performing the checking print automatically. To the contrary, assume that the job to be printed is a color print job, a glue binding job, or a job using glossy paper for printing. In this case, the control unit **205** controls to perform the checking print automatically. The printing system **1000** according to the embodiment is applicable to this configuration. This can improve the user friendliness of the checking print function, and suppress a trouble that print materials completed using a high value-added consumable provide only defective printing results.

[0120] The printing system **1000** having the following configuration instead of this configuration is also applicable as an embodiment of the present invention.

[0121] For example, as still another embodiment of the above-mentioned determination, the control unit **205** determines whether the job to be printed by the printer unit **203** is of the first or second job type. A concrete example of a job of the first job type is a job requiring printing of print data of an original document scanned by the scanner **302** functioning as a document reader. A concrete example of a job of the second job type is a job requiring printing of print data transmitted from an external apparatus, such as an information processing apparatus (e.g., the PC **104**), which can communicate data with the printing apparatus **100**.

[0122] Assume that the job to be printed by the printer unit **203** is of the first job type. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to complete printing of the job without causing the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0123] Assume that the job to be printed by the printer unit **203** is of the second type. If the control unit **205** makes a determination corresponding to this case, it causes the printer unit **203** to perform printing automatically by the checking print function during printing of the job.

[0124] In this configuration, assume that the job to be printed corresponds to a case where the operator in front of the printing apparatus **100** grasps in advance the contents of an original document to be printed, like a copy job. In this case, the control unit **205** controls to inhibit performing the checking print automatically. To the contrary, assume that the job to be printed corresponds to a case where the operator in front of the printing apparatus **100** does not grasp in advance the contents of an original document to be printed, like an external PDL job. That is, assume that a user other than the operator in front of the printing system **1000** inputs a print job from a remote terminal outside the printing system **1000**. In this case, the control unit **205** controls to perform the checking print automatically. The printing system **1000** according to the embodiment is applicable to this configuration. This can improve the user friendliness of the checking print function, and allows the operator of the printing system **1000** to easily check the printing result of data even if he does not grasp in advance the contents of the data to be printed. Further, this can suppress a trouble that the operator cannot know data during printing when he comes to the printing system **1000** in order to copy and printing is already in progress from the outside.

[0125] As described above, the printing system **1000** according to the embodiment copes with a plurality of types of configurations to perform printing automatically by the checking print function. However, the printing system **1000** may also be configured to have only one, two or more, or all of these types of configurations. Although the embodiment includes the printing system **1000** having configurations corresponding to various changes and applications, the printing system **1000** preferably comprises even a configuration corresponding to the following configuration of the printing system **1000** according to the embodiment.

[0126] Assume that printing by the checking print function is performed automatically during printing of a job by the printer unit **203**, as described above. In this case, the control unit **205** controls the printer unit **203** to perform printing automatically by the checking print function repetitively at predetermined intervals.

[0127] Assume that the job to be printed requires printing of a predetermined number or more of sheets. In this case, the control unit **205** in the embodiment causes the printer unit **203** to perform printing automatically by the checking print function instead of printing of the job every time a specific number of sheets smaller than the predetermined number of sheets are printed in printing of the job. In the embodiment, assume that the control unit **205** determines that the job to be printed requires printing of 5,000 or more sheets. On condition of this, the control unit **205** causes the printer unit **203** to perform the checking print automatically instead of printing of the job every time 100 print sheets are successively printed in printing of the job. The series of control operations is a concrete example of the configuration.

[0128] Assume that the job to be printed is a large-volume print job in which the time necessary for printing from the start to completion of printing is equal to or longer than a predetermined time. In this case, the control unit **205** in the embodiment causes the printer unit **203** to perform printing automatically by the checking print function instead of printing of the job every time printing of the job is done for a specific time shorter than the time necessary to complete printing of the job. In the embodiment, assume that the control unit **205** determines that the job to be printed requires printing of 20 min or more till the completion of printing. On condition of this, the control unit **205** causes the printer unit **203** to perform the checking print automatically instead of printing of the job every time printing of the job is done continuously for 5 min. The series of control operations is another concrete example of the configuration.

[0129] The printing system **1000** according to the embodiment is configured to be able to selectively perform an operation of performing the checking print for a job after a specific number of sheets are printed, like the former configuration, and an operation of performing the checking print for a job after printing is done for a specific time, like the latter configuration.

[0130] For this purpose, in the embodiment, the control unit **205** functions as a unit for accepting the first or second instruction in advance from the user via a user interface.

[0131] The first instruction is an instruction from the user to designate the number of sheets in order to determine the number of sheets printed for a job after which printing by the checking print function is performed automatically when printing by the checking print function is performed automatically during printing of the job by the printer unit **203**. In the embodiment, when the first instruction has already been input from the user via a user interface, the control unit **205** controls the printer unit **203** to perform printing automatically by the checking print function in accordance with the first instruction.

[0132] The second instruction is an instruction from the user to designate the time in order to determine the time (min)

of printing of a job after which printing by the checking print function is performed automatically when printing by the checking print function is performed automatically during printing of the job by the printer unit **203**. In the embodiment, when the second instruction has already been input from the user via a user interface, the control unit **205** controls the printer unit **203** to perform printing automatically by the checking print function in accordance with the second instruction.

[0133] Various configurations described above can provide a further effect capable of enhancing the above-mentioned effects of the checking print function in the printing system **1000**. In addition to these configurations, the printing system **1000** in the embodiment also comprises the following configuration.

[0134] For example, the control unit **205** in the embodiment also functions as a unit for accepting a request in advance from the user via a user interface to inhibit or permit performing printing automatically by the checking print function during printing of a job by the printer unit **203**.

[0135] Assume that the user has already input a request via the user interface to inhibit performing printing automatically by the checking print function. Based on this request, the control unit **205** inhibits performing printing automatically by the checking print function during printing of a job by the printer unit **203**, like each configuration described above. To the contrary, assume that the user has not input this request via the user interface yet, but has already input an instruction via the user interface to permit performing printing automatically by the checking print function. When the control unit **205** makes a determination corresponding to this case, it permits performing printing automatically by the checking print function during printing of a job by the printer unit **203**, like each configuration described above.

[0136] Like various configurations described above, the control unit **205** in the embodiment determines whether the condition to cause the printer unit **203** to perform printing automatically by the checking print function is satisfied. If the control unit **205** determines that no condition is satisfied, it controls not to perform (to inhibit) printing by the checking print function automatically during printing of a job by the printer unit **203**.

[0137] In this fashion, the printing system **1000** in the embodiment comprises even a configuration corresponding to the case where it is inhibited to perform printing automatically by the checking print function during printing of a job. Even in this case, if the user explicitly inputs an instruction to perform the checking print, the control unit **205** permits the printer unit **203** to perform printing by the checking print function during printing of the job.

[0138] Assume that it is inhibited to perform printing automatically by the checking print function during printing of a job. Even in this case, the control unit **205** in the embodiment permits accepting a request from the user via the above-mentioned user interface to print by the checking print function while the printer unit **203** performs printing of a target job. On condition that the user has input this request via the user interface while printing of the job is in progress, the control unit **205** causes the printer unit **203** to perform printing by the checking print function during printing of the job. In this manner, the printing system **1000** according to the embodiment comprises even a configuration corresponding to a manual input.

[0139] In other words, the printing system **1000** according to the embodiment has two, first and second modes as a method of causing the printer unit **203** to perform printing by the checking print function.

[0140] As the first mode, the printing system **1000** according to the embodiment has an automatic mode in which the control unit **205** causes the printer unit **203** to perform printing automatically by the checking print function when a predetermined condition is satisfied, as described above. In the embodiment, this condition is a predetermined stipulated condition under which the control unit **205** permits performing printing automatically by the checking print function. This condition is decision-making data which defines a condition to permit performing the checking print automatically and is used by the control unit **205**.

[0141] As for the automatic mode, the embodiment has described the following seven conditions as the predetermined stipulated condition to cause the printer unit **203** to perform printing automatically by the checking print function.

[0142] (1) The job to be printed requires a predetermined stipulated number (5,000 in a concrete example to be described later) or more of print media as a condition to complete printing.

[0143] (2) The job to be printed requires a predetermined stipulated time (e.g., 10 min) or more as a condition to complete printing.

[0144] (3) The job to be printed needs to output print materials to a discharge destination (the stack tray of the large-volume stacker in the embodiment) inside a specific type of post processing apparatus as a discharge destination determined in advance as a condition.

[0145] (4) The job to be printed requires specific type of post processing including a plurality of steps (e.g., case binding including a gluing step, cutting step, and the like) as type of post processing determined in advance as a condition.

[0146] (5) The job to be printed requires a specific type of consumable (a high value-added coloring material, print medium, or binding member in the above-mentioned example) determined in advance as a condition.

[0147] (6) The job to be printed is a print job of a type (attribute) determined in advance as a condition, and requires printing of print data transmitted from an apparatus capable of communicating data with the printing apparatus **100**.

[0148] (7) The user has not input a request via a user interface in advance to inhibit performing printing automatically by the checking print function.

[0149] Stipulated conditions (1) to (7) are registered in advance in the memory of the printing apparatus **100** as management information for performing printing automatically by the checking print function. The embodiment provides a configuration which allows a specific operator such as the administrator to change settings corresponding to these stipulated conditions via an initial setting window (not shown).

[0150] For example, when "5,000" is registered as the initial value of the stipulated number of sheets corresponding to the above-described condition (1), the control unit **205** causes the operation unit **204** to display a user interface shown in FIG. **11**B in response to an instruction from the operator. This user interface displays 5,000 sheets as a default. This user interface presents 1,000 to 9,999 sheets as setting value can-

didates adaptable as the stipulated number of sheets. When the operator sets a value within this range via the user interface, the control unit **205** changes the setting in response to this to use the value set by the operator as the stipulated number of sheets. Other stipulated conditions can also be similarly changed in accordance with instructions via user interfaces.

[0151] The printing system **1000** according to the embodiment comprises a configuration which deals with all the seven conditions under the control of the control unit **205**, as described above. As a matter of course, the embodiment includes this configuration, but is not limited to this. For example, the embodiment includes even an apparatus or system having a configuration coping with only one of the seven conditions, or even an apparatus or system having a configuration coping with two to six conditions.

[0152] When making the above-mentioned determinations corresponding to conditions (1) to (7), the control unit **205** acquires the print processing conditions of a job to be printed, the total number of pages of print data, system configuration information of the printing system **1000**, and information on initial settings. For example, the control unit **205** specifies the print processing conditions on the basis of setting information set by the user via user interfaces in FIGS. **5** and **6**. The control unit **205** acquires the number of pages from job attribute information. Alternatively, the control unit **205** specifies the total number of pages from information from a counter which counts the number of pages of print data stored in the HDD **209**. System configuration information of the printing system **1000** and information on initial settings are registered in advance in the memory of the printing apparatus **100**. The control unit **205** specifies these pieces of information by reading them out. Based on the pieces of acquired information, the control unit **205** executes the above-mentioned determinations and control operations corresponding to conditions (1) to (7). However, these operations are merely examples, and the configuration is arbitrary as long as it can be determined whether the condition to perform printing automatically by the checking print function is satisfied, as described above.

[0153] In addition to the automatic mode, the printing system **1000** according to the embodiment also has a manual mode as the second mode. As described above, the printing system **1000** according to the embodiment has a mode in which printing by the checking print function is performed in response to a request input from the user via a user interface to perform printing by the checking print function while the printer unit **203** performs printing. This mode is the manual mode.

[0154] In this manner, the printing system **1000** has both the first mode (automatic mode) and the second mode (manual mode). The printing system **1000** according to the embodiment further comprises a constituent feature commonly applied to these two modes. This is a mechanism for further enhancing the effects of the checking print function obtained in the embodiment.

[0155] For example, the control unit **205** controls to set the same delivery destination for print materials obtained by printing based on the checking print function in both a case where printing by the checking print function is done in the first mode and a case where printing by the checking print function is done in the second mode. In these two cases, the control unit **205** controls to output, to a discharge destination different from that used in printing of a job, print materials obtained by printing based on the checking print function performed instead of printing of the job during printing of the job. In this way, the control unit **205** in the embodiment also functions as a discharge destination control unit for print materials printed by the checking print function.

[0156] In these two modes, the control unit **205** controls to output print materials obtained by the checking print function to the same location (delivery destination). In the embodiment, the control unit **205** controls to select the sample tray of the above-described large-volume stacker as the discharge destination. In both the automatic and manual modes, the control unit **205** outputs print materials obtained by the checking print function to a discharge destination exposed outside a post processing apparatus. Further in the embodiment, in both the automatic and manual modes, the control unit **205** controls not to output print materials obtained by the checking print function to a discharge destination inside a post processing apparatus, such as the stack tray of the large-volume stacker.

[0157] In this fashion, the control unit **205** inhibits outputting print materials obtained by printing based on the checking print function to a discharge destination inside a specific type of post processing apparatus regardless of the first or second mode in which printing by the checking print function is performed. In the two cases, the control unit **205** controls to output (permit outputting) print materials obtained by printing based on the checking print function to a discharge destination outside the specific type of post processing apparatus without outputting print material obtained by printing based on the checking print function to the output destination inside the specific type of post processing apparatus.

[0158] These configurations can suppress a trouble that the delivery destination of print materials obtained by the checking print function differs between the first and second modes and this confuses the operator. These configurations can also suppress a trouble that print materials obtained by the checking print function are discharged to a discharge destination exposed outside the apparatus in one mode whereas they are discharged to a discharge destination inside the apparatus, and this increases the burden on the operator and impairs the user friendliness of the checking print function.

[0159] In addition to these configurations, the printing system **1000** according to the embodiment comprises a configuration coping with control commonly applied to the first and second modes.

[0160] For example, the control unit **205** causes the printer unit **203** to perform printing by the checking print function instead of printing of a job during printing of the job regardless of the first or second mode in which printing by the checking print function is performed. In the two cases, the control unit **205** controls the printer unit **203** to automatically resume (permit resuming) printing of a job after the printer unit **203** performs printing by the checking print function.

[0161] This configuration can provide a further effect capable of enhancing the above-mentioned effects of the checking print function in both the first and second modes without causing a trouble that the productivity of a job to be printed decreases unnecessarily owing to printing by the checking print function.

[0162] In the embodiment, the control unit **205** controls to be able to accept, prior to at least printing by the checking print function in the second mode, an instruction from the user via a user interface in advance to inhibit resuming printing automatically by the checking print function in the second

mode. If the control unit **205** has accepted this instruction in advance, it inhibits the printer unit **203** from resuming printing automatically by the checking print function in at least the second mode after performing printing by the checking print function.

[0163] The embodiment can provide a mechanism capable of flexibly meeting user needs in the first and second modes. The mechanism can attain a further effect capable of enhancing the above-mentioned effects of the checking print function.

[0164] Automatically performing printing by the checking print function means performing printing by the checking print function when the above-mentioned condition is satisfied, without explicitly inputting an instruction from the user to perform printing by the checking print function for a job to be printed.

[0165] In the embodiment, as described above, the control unit **205** of the printing apparatus **100** executes a plurality of types of determinations and/or control operations associated with the checking print function. However, the embodiment is not limited to this configuration, and can also employ another one. For example, in place of the control unit **205**, the control unit of an apparatus (apparatus capable of communicating data with the printing apparatus **100** via a communication unit), such as an information processing apparatus (e.g., the PC **103** or **104**) or a post processing apparatus (e.g., the sheet processing apparatus **108** or **109**) executes these determinations and/or control operations. The embodiment is also applicable to this configuration. When an apparatus other than the printing apparatus **100** executes these determinations and/or control operations, this apparatus provides the above-mentioned user interface.

[0166] The embodiment may also adopt a configuration in which one unit executes a plurality of types of determinations and/or control operations associated with the checking print function, or a configuration in which a plurality of units execute these determinations and/or control operations in cooperation with each other. Hence, the embodiment is applicable to even a configuration in which one CPU controls the apparatus and/or system, or a configuration in which a plurality of CPUs control the apparatus and/or system in cooperation with each other. In this manner, various modifications and applications can be made.

[0167] Supplementary remarks and concrete examples of the configuration associated with the checking print function of the printing system **1000** according to the above-described embodiment will be listed below.

[0168] Various configurations to be described below may also be selected and properly applied if they are consistent with the above-described configurations associated with the checking print function. The following configurations are merely examples, and the embodiment is not limited to them. The configuration of the embodiment may also be completed by only configurations based on the above-described configurations associated with the checking print function. The following example employs the operation unit **204** and/or windows displayed on the operation unit **204** as concrete examples of the above-mentioned user interfaces. However, the embodiment is not limited to them. For example, when the PC **103** or PC **104** executes determinations and/or control operations associated with the checking print function, as described above, the operation unit of the apparatus and/or windows displayed on the operation unit are applied as user interfaces in the embodiment.

[0169] In the embodiment, the checking print function of the printing system **1000** is a function available to check printing results and/or change printing conditions, as described above. By using this function, the embodiment allows the printing system **1000** to create checking print materials for a target job until the print operation of the job ends after it starts.

[0170] Assume that a print execution request has been accepted for a target job from the operator via the operation unit **204**. In response to the print execution request, the control unit **205** causes the printing system **1000** to start the print operation of the job. After that, the control unit **205** controls the operation unit **204** to be able to accept a request from the operator to perform the checking print operation for the job during printing while the printing system **1000** actually performs the print operation. Assume that the checking print request is accepted for the job from the operator, or the print status of the job meets an automatic execution condition while the printer unit **203** performs the print operation of the job. In this case, the control unit **205** interrupts the print operation of the job in execution by the printer unit **203** in response to the checking print request input from the operator or the print status of the job that meets the automatic execution condition. Immediately after the printing system **1000** interrupts the print operation of the job subjected to the checking print operation, the control unit **205** causes the printing system **1000** to perform the checking print operation for the job. In the checking print operation, the printing system **1000** creates a checking print material for the checking print-requested job. When performing the checking print operation, the control unit **205** reads out, from the HDD **209**, print data of the job whose print operation has been interrupted, and causes the printing apparatus **100** to perform print processing. Upon completion of the print processing by the checking print, the control unit **205** notifies the operator of the completion of the checking print. Immediately after the checking print is complete, the control unit **205** controls the printing system **1000** to automatically resume (continue) the print operation of the print-interrupted job.

[0171] When the operator makes the print settings of a target job via the operation unit **204** and the number of print sheets of the job exceeds a stipulated number of print sheets, the control unit **205** displays an automatic checking print execution condition setting window on the operation unit **204** to allow automatically performing the checking print for the job.

[0172] Assume that a condition to permit inputting an automatic checking print execution condition has been set in advance via the operation unit **204**. At this time, assume that the user inputs a printing condition via the operation unit **204**. Then, assume that the control unit **205** accepts a print execution request from the operator via the operation unit **204** for the target job. In response to the print execution request, the control unit **205** causes the printing system **1000** to start the print operation of the job. Thereafter, the control unit **205** controls the operation unit **204** to be able to accept a request from the operator to perform the checking print operation for the job during printing while the printing system **1000** actually performs the print operation. At the same time, the control unit **205** determines whether the print status of the job in execution meets the condition set via the operation unit **204** before the start of the job. If the control unit **205** determines that the print status of the job in execution meets the automatic checking print execution condition, it interrupts the print

operation of the job in execution by the printer unit **203** regardless of whether the operator has input a checking print request via the operation unit **204**. Immediately after the printing system **1000** interrupts the print operation of the job in execution, the control unit **205** causes the printing system **1000** to perform the checking print operation of the job. In the checking print operation, the printing system **1000** creates a checking print material for the job in execution. When performing the checking print operation, the control unit **205** reads out, from the HDD **209**, print data of the job whose print operation has been interrupted, and causes the printing apparatus **100** to perform print processing. Upon completion of the print processing by the checking print, the control unit **205** controls to notify the operator that the checking print is complete. Immediately after the checking print is complete, the control unit **205** controls the printing system **1000** to automatically resume (continue) the print operation of the print-interrupted job.

[0173] A print operation which is interrupted in response to a checking print operation execution request and automatically resumes in the printing system **1000** in response to the end of the checking print operation will be called the actual print operation of a job having undergone the checking print operation, or the print operation of a checking print-requested job. Print materials created by the print operation of a job subjected to the checking print will be called the actual print materials of the job subjected to the checking print operation, or the print materials of a checking print-requested job. To the contrary, print materials created by the checking print operation will be called the checking print materials of a checking print-requested job.

[0174] As a concrete example of this, a configuration will be described, in which the control unit **205** controls to be able to select which of the first and second type checking print operation is performed automatically or manually on the basis of settings by the operator and the settings of actual print materials.

[0175] As another concrete example of this, a configuration will be described, in which the control unit **205** controls the printing system **1000** to perform the checking print automatically for a job, for which the operator has not requested the checking print, on the basis of one of the above-described conditions designated via the operation unit **204**.

[0176] The first type checking print operation causes the printing system **1000** to print once (i.e., by one set) print data of all pages used in the actual print operation of a checking print-requested job.

[0177] The second type checking print operation causes the printing system **1000** to print only print data of one page among print data of a checking print-requested job. In the second type checking print operation, the control unit **205** controls the printing system **1000** to print a page during printing when the operator inputs a checking print request via the operation unit **204**.

[0178] Assume that the printing system **1000** has started the print operation of a job formed from original document data of 100 pages. Assume that the operator inputs a checking print request for the job via the operation unit **204** at the timing when the printer unit **203** prints the 25-th page. Also assume that the operator requests the checking print for only one page. In this case, the control unit **205** controls the printing system **1000** to print, as the checking print operation, only print data of the 25th page corresponding to the page during printing upon receiving the checking print request. In the embodiment, the printing system **1000** is configured to issue a paper feed command to the printer unit **203** for each page. In the second type checking print operation, the control unit **205** controls the printing system **1000** to print the same page as that for which the paper feed command has been issued upon receiving the checking print request. In this fashion, according to the embodiment, the control unit **205** controls the printing system **1000** to be able to perform the second type checking print operation to print only the same page as that during printing upon receiving a checking print request.

[0179] In the second type checking print operation which is performed automatically, the control unit **205** controls the printing system **1000** to print a page during printing when the intermediate execution result of a print job in execution meets the automatic checking print execution condition.

[0180] Assume that the printing system **1000** has started the print operation of a job formed from original document data of 10,000 pages. At this time, assume that the checking print is performed for a page during printing every 500 sheets as the automatic checking print execution condition. Also assume that the cumulative number of print sheets of the job reaches 500 sheets after printing of 10 min. In this case, the control unit **205** controls the printing system **1000** to print, as the checking print operation, only print data of the same page as the 500th page during printing. In the embodiment, the printing system **1000** is configured to issue a paper feed command to the printer unit **203** for each page. In the second type checking print operation, the control unit **205** controls the printing system **1000** to print the same page as that for which the paper feed command has been issued upon receiving the checking print request. In this manner, according to the embodiment, the control unit **205** controls the printing system **1000** to be able to perform the second type checking print operation to print only the same page as that during printing upon receiving a checking print request.

[0181] Assume that the printing system **1000** has started the print operation of a job requiring printing of 100-page original document data by 100 copies. At this time, assume that the checking print is performed for one copy including a page during printing every 10 min as the automatic checking print execution condition. Also assume that the cumulative print time of the job reaches 10 min after 680 sheets are printed. In this case, the control unit **205** controls the printing system **1000** to print, as the checking print operation, document data including the 680th page during printing from the first page. In the embodiment, the printing system **1000** is configured to issue a paper feed command to the printer unit **203** for each page. When executing the second type checking print operation, the control unit **205** controls the printing system **1000** to print only print data of one page corresponding to a page for which the paper feed command has been issued upon receiving the checking print request. In this way, according to the embodiment, the control unit **205** controls the printing system **1000** to be able to perform the second type checking print operation to print the print data including a page during printing upon receiving a checking print request.

[0182] After performing print processing by the checking print, the control unit **205** controls to notify the operator that the checking print has been performed. In a concrete example of this, a configuration in which all the following three types of notifications are issued will be described. However, the embodiment is not limited to this configuration. For example, one or two of the following notifications may also be issued. The following exemplary notification processing may also be

commonly applied to the first and second modes, as described above, but may also be applied in a different way. For example, the control unit **205** controls to perform the following exemplary notification processing only in the first mode (automatic mode) and not to perform it in the second mode (manual mode). This configuration can omit unnecessary processing, and further enhance the above-described effects of the checking print function.

[0183] (1) Notification by Display on Printing Apparatus

[0184] After performing the checking print, the control unit **205** displays, on the operation unit **204** of the printing system **1000**, a notification that the checking print has been performed. By combining a display based on lighting of the lamp of the printing system **1000** and a notification based on ringing of a buzzer, the control unit **205** controls to notify the operator that the checking print has been performed. This control allows the operator to detect that the checking print has been performed, and check the result of checking print materials printed by performing the checking print.

[0185] (2) Notification by E-Mail

[0186] The control unit **205** controls to notify the operator that the checking print has been performed, by sending e-mail representing that the checking print has been performed to an arbitrary e-mail address registered in advance. The control unit **205** controls to describe, in the e-mail, information on a job having undergone the checking print, the state of the job when the checking print is performed, the condition under which the checking print is performed, and the execution result. In an environment at a distance from the printing system **1000** and an e-mail receivable environment independent of the printing system **1000**, the operator can detect that the checking print has been performed.

[0187] (3) Notification to Remote Terminal

[0188] The control unit **205** controls to display, on a terminal such as a Web browser or client software remote-connected to the printing system **1000** via a network, that the checking print has been performed. At this time, the control unit **205** controls to display information on a job having undergone the checking print, the state of the job when the checking print is performed, the condition under which the checking print is performed, and the execution result.

[0189] These notifications are selectively issued based on an instruction from the operator. The control unit **205** may also control to issue notifications (1) to (3) simultaneously when the checking print is performed.

[0190] The control unit **205** resumes interrupted actual print processing for print materials simultaneously when notifying the operator that the checking print has been performed.

[0191] The operator of the printing system **1000** visually checks a checking print material created by the checking print operation. In a concrete example of this, the control unit **205** controls the printing system **1000** to be able to selectively perform at least the following three processes in response to a request from the operator who has checked the output result of the checking print material.

1. Example (1) of Processing Control Unit **205** Causes Printing System **1000** to Perform in Response to Request From Operator Who had Checked Result of Checking Print Material Output by Checking Print

[0192] Assume that the operator visually checks the checking print material of a job having undergone the checking print operation, and determines that the checking print material does not have an output style he wants. In this case, the control unit **205** controls the printing system **1000** to stop (cancel), based on a request from the operator, the actual print operation of the job that has automatically resumed in the printing system **1000** immediately after performing the checking print operation. By this control, the control unit **205** forcibly ends the processing of the job. Note that the control unit **205** accepts a request from the operator via a key **2401**F of a window **2400**F in FIG. **10**E (to be described later).

2. Example (2) of Processing Control Unit **205** Causes Printing System **1000** to Perform in Response to Request from Operator Who has Checked Result of Checking Print Material Output By Checking Print—Processing to Change Actual Print Processing Condition Specific to Print Job Subjected to Checking Print

[0193] Assume that the operator visually checks a checking print material, and determines that the checking print material does not have an output style he wants. In this case, the control unit **205** controls the printing system **1000** to suspend, in response to a request from the operator, the actual print operation of the job that has automatically resumed in the printing system **1000** immediately after performing the checking print operation. During the suspension, the control unit **205** accepts a setting from the operator via the operation unit **204** to change the output style of the job. For example, the control unit **205** accepts a setting change for the type of print medium necessary for the actual print operation of a job, and a setting change for the density in printing. As other setting changes, the control unit **205** accepts a setting change to increment/decrement the number of copies, and a setting change for post processing such as stapling. The control unit **205** controls the operation unit **204** to be able to accept, from the operator, these setting changes of job-specific print processing conditions. After that, the control unit **205** controls the printing system **1000** to create and output actual print materials again from the beginning under setting-changed print processing conditions on the basis of a request from the operator. In this manner, the control unit **205** allows the operator to change settings specific to a job subjected to the checking print. The control unit **205** accepts a suspension request from the operator via a key **2401**D of a window **2400**D in FIG. **10**D (to be described later). Also, the control unit **205** accepts setting changes from the operator via a window **2300**A in FIG. **9**F (to be described later) or a window **2400**C in FIG. **10**C (to be described later).

3. Example (3) of Processing Control Unit **205** Causes Printing System **1000** to Perform in Response to Request From Operator Who has Checked Result of Checking Print Material Output by Checking Print

[0194] This processing is applied to a case where the operator visually checks checking print materials, and determines that an adjustment value specific to the printing system **1000** that influences not only the current job but also other jobs needs to be changed. This corresponds to a case where the operator checks the output result of the checking print and determines that the adjustment value (parameter) specific to the printing system **1000** including the printing apparatus **100** needs to be corrected. Note that the system-specific parameter

includes system-specific parameters (e.g., the temperature of the fixing unit of the printer unit **203** and the print medium feeding speed) directly related to print processing of the printing system **1000**, and a print density value serving as the reference value of the device. In the embodiment, the system-specific parameters include at least one of the following four parameters:

[0195] (1) adjustment of the creep (deviation) correction amount of the print position on a print medium,

[0196] (2) automatic tone correction,

[0197] (3) density correction, and

[0198] (4) adjustment of the contrast between the text and the background.

[0199] When such an adjustment value is changed, the control unit **205** controls the printing system **1000** to reflect the change result of the adjustment value in even the printout result of a print job output from the printing system **1000** including the printing apparatus **100**. That is, the system-specific adjustment values (parameters) themselves are condition values which influence print processing of a target job. The embodiment includes even system-specific adjustment values (parameters) as an example of print processing conditions concerning a target print job.

[0200] The embodiment assumes that there are factors which change a printout result, in addition to the above-mentioned adjustment values. For example, members such as the feeder of the scanner unit **201** of the printing apparatus **100**, the wire of the printer unit **203**, and various rollers for conveying a print medium may be contaminated in accordance with the frequency of use and the period of use. In this case, a contaminated member can be cleaned to obtain a higher-quality output result. Thus, according to the embodiment, the control unit **205** controls the printing system **1000** to be able to perform at least one of the following three processes on the basis of a request from the operator after performing the checking print:

[0201] (1) cleaning of the feeder,

[0202] (2) cleaning of the wire, and

[0203] (3) cleaning of the roller.

[0204] Assume that the control unit **205** causes various related units of the printing system **1000** to clean a variety of members. Also in this case, the printout result of a print job output from the printing system **1000** including the printing apparatus **100** changes. The cleaning processing for the members of the printing system **1000** also influences print processing of a target job. Thus, the embodiment includes even execution of the cleaning processing for the members of the printing system **1000**, as an example of changing print processing conditions concerning a target print job.

[0205] The control unit **205** causes the printing system **1000** to change the above-mentioned processing conditions (parameters) specific to the printing system **1000** in accordance with an operator operation after performing the above-described checking print operation. Then, the control unit **205** controls the printing system **1000** to be able to process a job having undergone the checking print in print processing complying with the changed system-specific parameter. In addition, the control unit **205** controls the printing system **1000** to process not only a target job but also another job such as a job in the print queue in print processing complying with the changed system-specific parameters.

[0206] In this way, the control unit **205** controls the printing system **1000** to be able to change, based on an operator request after performing the checking print, a system-specific processing condition which influences the print processing conditions of a plurality of jobs, and to successively process these jobs by the printing system **1000**.

[0207] Assume that the control unit **205** causes the printing system **1000** to perform the checking print operation. In this case, the control unit **205** controls to be able to change, in accordance with an instruction accepted from the operator via the operation unit **204**, a "print processing condition concerning the print operation of a job subjected to the checking print operation and also concerning the print operation of another job different from this job". The control unit **205** accepts, from the operator via the window **2400**C in FIG. **10**C (to be described later) or the like, a setting change after performing the checking print.

[0208] A configuration associated with the checking print will be further explained.

[0209] Assume that the control unit **205** causes the operation unit **204** to present a display in FIG. **5**. This display processing corresponds to a process in step S**101** of FIG. **16**A (to be described later).

[0210] When the operator presses the user mode key **505** in the display of FIG. **5**, the control unit **205** controls the operation unit **204** to display a window as shown in FIG. **11**A. When the operator designates a key **1401** for setting the checking print in the window shown in FIG. **11**A, the control unit **205** controls to display a "window which allows the operator to input the initial settings of the checking print" shown in FIG. **11**B on the operation unit **204**. In FIG. **11**B, the number of print sheets in an area **1501** is the set number of print sheets of a job at which an automatic checking print can be selected. This processing corresponds to steps S**102** and S**103** in FIG. **16**A.

[0211] The set number of print sheets is defined as a threshold. That is, when the number of print sheets of a print job is equal to or larger than the threshold, the control unit **205** controls to be able to set an automatic checking print execution condition in a print job printing condition setting window. This processing corresponds to step S**105** of FIG. **16**A.

[0212] Assume that the operator sets 5,000 or more sheets as the set number of print sheets of a job at which the automatic checking print can be selected. Thereafter, the control unit **205** controls to display an automatic checking print execution selection window shown in FIG. **12** for the job as long as the set number of print sheets of a subsequent job set to be printed exceeds 5,000 or more.

[0213] Assume that the control unit **205** accepts a series of printing conditions for a target job from the operator via the display in FIG. **5**. The processing to accept the printing conditions is a process in step S**104** of FIG. **16**A (to be described later). This job will be referred to as job X. Assume that job X is a job for scanning an original document including a total of 10 pages by the scanner unit **201**, and printing the print data of the scanned original document by the printer unit **203** via the HDD **209**.

[0214] Also assume that the operator sets the following exemplary processing conditions as printing conditions for job X via the display in FIG. **5**:

[0215] (1) "paper size=A4, and the type of paper=plain paper" as settings of a print medium necessary for printing,

[0216] (2) copy ratio=100%,

[0217] (3) stapling as a finishing setting, and

[0218] (4) total number of copies="100".

[0219] Assume that the operator sets these processing condition parameters (1) to (4) via the operation unit **204** pre-

senting the display in FIG. **5**. In this case, the control unit **205** controls the operation unit **204** to reflect the contents set by the operator. For example, the control unit **205** controls the touch panel section **401** to update the display contents in the touch panel section **401** of the operation unit **204** from those shown in FIG. **5** to those shown in FIG. **9**A.

[0220] When the number of print sheets of job X meets the "condition to enable setting the automatic checking print" set in the window shown in FIG. **11**B, the control unit **205** permits accepting an instruction to set an automatic checking print execution condition for job X. At this time, the control unit **205** enables a "checking print" key **2310** in a window shown in FIG. **9**B as a key used to input an automatic checking print execution condition for job X. When the operator designates the "checking print" key **2310**, the control unit **205** causes the touch panel section **401** to present a display shown in FIG. **12**. Then, the control unit **205** accepts the setting of the automatic checking print execution condition for job X from the operator via the window shown in FIG. **12**.

[0221] For example, when the operator designates an advanced setting key **1603** in the window shown in FIG. **12**, the control unit **205** causes the touch panel section **401** to display a window shown in FIG. **13**A. The operator designates a setting key **1701** in the touch panel section **401**, and selects the interval of a stipulated number of sheets at which the checking print is performed automatically. When the operator designates this key to select the number of sheets, the control unit **205** controls to perform the checking print automatically every time the cumulative number of print sheets after the start of a job reaches the interval of the set number of sheets.

[0222] Also, the operator designates a setting key **1702** in the touch panel section **401**, and selects the interval of a stipulated time at which the checking print is performed automatically. When the operator designates this key to select the time, the control unit **205** controls to perform the checking print automatically every time the cumulative print execution time after the start of a job reaches the set time interval.

[0223] In the above description, the control unit **205** displays stipulated automatic execution conditions in the touch panel section **401**, and prompts the operator to select one of them. However, the control unit **205** may also adopt another configuration. For example, when the operator designates the advanced setting key **1603** in FIG. **12**, the control unit **205** displays, in the touch panel section **401**, a window for prompting him to select either the interval of the number of print sheets or the print execution time as the automatic execution condition. After the operator selects either condition, the control unit **205** controls the touch panel section **401** to display a window for prompting him to input an arbitrary interval.

[0224] When the operator designates a key **1704** in the window shown in FIG. **13**A, the control unit **205** displays a window shown in FIG. **13**B in the touch panel section **401**. In this window, the control unit **205** accepts a setting when performing the automatic checking print. For example, if the operator designates a key **1705** shown in FIG. **13**B, the control unit **205** controls to perform the first type checking print when performing the automatic checking print. If the operator designates a key **1706** shown in FIG. **13**B, the control unit **205** controls to perform the second type checking print when performing the automatic checking print.

[0225] A case where the actual print operation of job X starts will be explained. Assume that the operator presses the start key **503** while the touch panel section **401** displays the window shown in FIG. **9**A. Then, the control unit **205** determines that it has accepted a request (print execution request) from the operator via the operation unit **204** to perform the print operation of job X. The determination of whether the print execution request (print start request) has been accepted corresponds to a process in step S**108** of FIG. **16**A (to be described later). This print operation is the actual print operation of job X subjected to the checking print operation. The timing to start the actual print operation of job X is time T**0** shown in FIG. **8**.

[0226] As described above, assume that the operator presses the start key **503** while the touch panel section **401** displays the window shown in FIG. **9**A. Assume that another job, for which a print execution request has been input, does not exist in the HDD **209** other than job X when the operator presses the start key **503**. If this condition is satisfied, the control unit **205** causes the printing system **1000** to start a series of print operations of job X in response to a print execution request for job X from the operator. As the series of print operations of job X, the control unit **205** controls the printing system **1000** to perform the following operations.

[0227] As described above, upon accepting the print execution request for job X from the operator via the start key **503**, the control unit **205** causes the scanner unit **201** to sequentially scan a 10-page original document of job X from the first page. Simultaneously when the printing system **1000** starts the scanning operation, or simultaneously when the control unit **205** rasterizes the 10-page original document data in the HDD **209**, the control unit **205** causes the touch panel section **401** to present a display for prompting the operator to check the progress (process status) of job X. The control unit **205** controls the touch panel section **401** to popup-display the window **2300**A at a timing when it accepts the print execution request for job X from the operator. The processing to popup-display the window **2300**A corresponds to a process in step S**109** of FIG. **16**A (to be described later). The window **2300**A is a job process status window configured to be able to notify the operator in real time of the progress such as the process status of a job whose print operation starts. The job process status window **2300**A is a "print status window" shown in FIG. **16**B.

[0228] The control unit **205** acquires pieces of status information of job X from units which perform operations (e.g., a scanning operation, storage operation, reception operation, rasterization operation from the storage device, print operation, and finishing operation for job X) necessary to complete the print operation of job X. The control unit **205** controls the touch panel section **401** to update the display contents of the window **2300**A to those reflecting the status information.

[0229] A display field **2300** at the bottom of windows exemplified in FIGS. **9**A to **11**A, **14**, and **15** is a status display portion capable of displaying status information when there is status information of high priority which should be notified to the operator. For example, in the stage of the window shown in FIG. **9**A, no actual processing of job X has started. In this case, as shown in FIG. **9**A, the control unit **205** controls the touch panel section **401** not to display any status information in the display field **2300**. In the state of the window shown in FIG. **9**D, the print operation of job X is in progress. In this case, the control unit **205** controls the touch panel section **401** to display, even in the display field **2300**, information representing the process status of job X.

[0230] Assume that the printer unit **203** does not perform printing of job X at present. In this case, the control unit **205** inhibits accepting a checking print request for job X from the operator.

[0231] For example, in the stage of the window shown in FIG. **9**C, the storage operation of job X in the HDD **209** has started, but printing of print data of job X has not started yet. In this case, the control unit **205** inhibits accepting a checking print request for job X in the stage of the window shown in FIG. **9**C. In this case, the control unit **205** controls the touch panel section **401** to disable a key **2301**A so the operator cannot designate the key **2301**A, as shown in FIG. **9**C. When the job processed in the printing system **1000** is not during printing, the control unit **205** controls to inhibit accepting a checking print request for the job from the operator. As a method of disabling the key **2301**A, the key **2301**A may also be grayed out as shown in FIG. **9**C, or may also be disabled in another way, e.g., hatched or not displayed.

[0232] After the end of reading in FIG. **9**C, the total number of print sheets of job X is finalized. At this time, the control unit **205** determines in advance whether job X meets the automatic checking print execution condition as shown in FIG. **11**B. If job X meets this condition, the control unit **205** controls the operation unit **204** to display a checking print setup window as shown in FIGS. **12**, **13**A, and **13**B.

[0233] When the operator designates a key **1601** shown in FIG. **12** and sets to perform the checking print automatically, the control unit **205** sets an automatic checking print execution condition. When the operator designates the advanced setting key **1603**, the control unit **205** controls to successively display windows shown in FIGS. **13**A and **13**B.

[0234] When the operator designates an OK key **1605** shown in FIG. **12** or an OK key **1708** shown in FIG. **13**B, the control unit **205** controls to return the window to the display shown in FIG. **9**C.

[0235] Assume that the progress of job X has further changed from the stage of the display shown in FIG. **9**C. For example, all 10 pages of the original document of job X have been transferred from the scanner unit **201** to the HDD **209**. Assume that all the 10 pages of job X have been stored in the HDD **209**. Further, assume that the print data of job X are being read out from the HDD **209** and printed now in order to complete printing of a total of 100 copies necessary for job X. The control unit **205** acquires various kinds of information for specifying this situation from the operation unit **204**, scanner unit **201**, HDD **209**, and printer unit **203**. In this manner, even if the process status has changed, the control unit **205** controls the touch panel section **401** to update the display contents of the window **2300**A to those based on the acquired information.

[0236] For example, the control unit **205** controls the touch panel section **401** to update the display contents of the window **2300**A representing the process status of job X to those shown in FIG. **9**D so as to deal with a change of the progress of job X.

[0237] The display shown in FIG. **9**D is configured to allow the operator to confirm that the storage operation of print data of job X in the HDD **209** is complete and the print operation of print data of job X is in execution. For example, the window shown in FIG. **9**D displays a message "printing of job of acceptance number 0003 (job X in this example) is in progress". The window shown in FIG. **9**D notifies the operator that job X requires printing of a total of 100 copies and printing of the 10th sheet in printing of the fourth copy (printing of the fourth set) is in progress now. The display shown in FIG. **9**D corresponds to a stage in which printing of job X is in execution. As shown in FIG. **9**D, the control unit **205** controls the touch panel section **401** to enable the "checking print" key **2301**A in the window **2300**A. When the target job, for which a print execution request has been issued, is during printing, the control unit **205** controls to permit (enable) accepting a checking print request for the job from the operator. The control unit **205** controls the touch panel section **401** to display status information of the job even in the display field **2300** so that the operator can grasp the process status of the job even after the popup display of the window **2300**A disappears.

[0238] In this fashion, the control unit **205** controls the touch panel section **401** to update the display contents of the window **2300**A for a job, for which a print execution request has been issued, in real time in synchronism with the process status of the job in the printing system **1000**. For example, the control unit **205** controls the touch panel section **401** to sequentially update the display contents of the window **2300**A in accordance with the progress of job X in the printing system **1000**, like an example of control to change the display to those shown in FIGS. **9**A to **9**D. The control unit **205** also controls the touch panel section **401** to update the display contents of the display field **2300** at the bottom of the touch panel section **401** to those synchronized with the process status of the target job.

[0239] Based on whether printing of a target job, for which a print execution request has been issued, is in execution in the printing system **1000**, the control unit **205** determines whether to accept a checking print request for the job. For example, the control unit **205** controls the operation unit **204** to allow the operator to designate the key **2301**A, as shown in FIG. **9**D, on condition that the print operation of job X is in execution by the printer unit **203**. Accordingly, the control unit **205** permits accepting a checking print request for job X from the operator via the key **2301**A. When the target job, for which a print execution request has been issued, is during printing, the control unit **205** controls to permit (enable) accepting a checking print request for the job from the operator.

[0240] Based on whether printing of a target job, for which a print execution request has been issued, is in progress in the printing system **1000**, the control unit **205** determines the automatic checking print execution condition of the job. For example, when the automatic checking print execution condition is set to an interval of 5 min, as represented in the window shown in FIG. **13**A, the control unit **205** determines the execution condition on condition that the print operation of job X is in execution by the printer unit **203**. That is, while print processing is suspended in response to designation of a print suspension key **2401**A shown in FIG. **10**A, the control unit **205** neither determines the execution condition nor performs the checking print even if a suspension time of 5 min or more has elapsed. In this way, when the target job, for which a print execution request has been issued, is during printing, the control unit **205** controls to determine whether to perform the checking print automatically for the job.

[0241] In contrast, if no printing of job X is in progress, the control unit **205** disables the key **2301**A to prevent the operator from designating it, and inhibits accepting a checking print request for job X from the operator, as shown in FIG. **9**C. When the target job, for which a print execution request has

been issued, is not during printing, the control unit **205** controls to inhibit (disable) accepting a checking print request for the job from the operator.

[0242] Assume that the operator designates the active key **2301**A in the job process status window **2300**A shown in FIG. **9**D while the touch panel section **401** presents the display shown in FIG. **9**D. In this case, the control unit **205** causes the touch panel section **401** to present a display shown in FIG. **9**E in response to this key operation. This processing corresponds to a case where YES is determined in step S**115** of FIG. **16**B (to be described later) and the process advances to step S**116**.

[0243] A window **2300**B shown in FIG. **9**E is a display window configured to allow the operator to determine which of the first and second type checking print operations described above is performed for a job subjected to the checking print operation. The window **2300**B is a "checking print type selection window" shown in FIG. **16**B.

[0244] An "all pages" key **2301**B in the window **2300**B is a display key configured to allow the operator to input an instruction which causes the printing system **1000** to perform the first type checking print operation for a job permitted to perform the checking print operation.

[0245] An "one page (auto)" key **2302**B in the window **2300**B is a display key configured to allow the operator to input an instruction which causes the printing system **1000** to perform the second type checking print operation for a job permitted to perform the checking print operation.

[0246] The control unit **205** controls to alternatively select the key **2301**B or **2302**B. Except for a case where the operator selects the key **2301**B, the control unit **205** controls to select the key **2302**B in the window **2300**B. After the operator determines either checking print operation by selecting either key and designates a "start print" key **2304**B shown in FIG. **9**E, the control unit **205** determines that it has accepted a checking print operation execution request from the operator. If the operator does not designate the key **2304**B, the control unit **205** controls not to start the print operation for a job permitted to perform the checking print operation.

[0247] For example, it is determined as the current status that the operation unit **204** presents the display shown in FIG. **9**E, and the operator has not designated the key **2304**B. This determination corresponds to a case where NO is determined in step S**117** of FIG. **16**B (to be described later). In this state, the control unit **205** inhibits the start of the checking print operation of job X. In this state, the control unit **205** controls the printing system **1000** to continuously perform the actual print operation of job X by the printing system **1000** in order to complete the actual print operation of job X. In addition, the control unit **205** controls the touch panel section **401** to update even the display contents of the job process status window of job X in synchronism with the print status so as to notify the operator of this status in real time.

[0248] In this regard, for example, printing of the fourth copy (fourth set) of "job X requiring printing of 100 copies of 10-page print data by the actual print operation" is in execution in the stage of the display shown in FIG. **9**D. After that, the control unit **205** causes the operation unit **204** to present the display shown in FIG. **9**E. Further, the control unit **205** confirms that the operator has not designated the key **2304**B shown in FIG. **9**E. In this state, the control unit **205** causes the printing system **1000** to continue the actual print operation of job X permitted to perform the checking print operation. Assume that the control unit **205** causes the printer unit **203** to print the fourth copy (fourth set) of job X now. In this case, the control unit **205** controls the touch panel section **401** to notify the operator that "job X of acceptance number 0001 is during printing, and printing of the fourth copy (fourth set) out of a total of 100 copies (100 sets) is in progress now". For example, the control unit **205** controls to display in the display field **2300** a message "0001 copy printing in progress (4/100)" as the process status of job X, as shown in FIG. **9**E, while keeping displaying the window **2300**B.

[0249] Assume that the operator designates the "all pages" key **2301**B in the window **2300**B shown in FIG. **9**E and then the "start print" key **2304**B. Then, assume that the control unit **205** determines in response to this key operation that the operator has input a request to perform the first type checking print operation. This determination corresponds to a case where YES is determined in step S**117** of FIG. **16**B (to be described later). Upon receiving this request, the control unit **205** controls the printing system **1000** to stop (interrupt) the actual print operation of job X serving as a job in progress by the printing system **1000**. The control unit **205** controls the printing system **1000** to start the first type print operation as the checking print operation of job X without performing the second type checking print operation immediately after interrupting the actual print operation of job X.

[0250] To the contrary, assume that the operator designates the "one page (auto)" key **2302**B in the window **2300**B shown in FIG. **9**E and then the "start print" key **2304**B. In this case, assume that the control unit **205** determines in response to this key operation that the operator has input a request to perform the second type checking print operation. In this case, the control unit **205** controls the printing system **1000** to stop (interrupt) the actual print operation of job X serving as a job in execution by the printing system **1000**. The control unit **205** controls the printing system **1000** to start the second type print operation as the checking print operation of job X without performing the first type checking print operation immediately after interrupting the actual print operation of job X.

[0251] As described above, in the "first type checking print operation" which starts in the printing system **1000** instead of the actual print operation, print data of all pages to be printed in printing of one set in the actual print operation are printed once. In the above-described example, the control unit **205** controls the printing system **1000** to print the print data of all 10 pages of job X once, as first type checking print operation of job X.

[0252] As described above, in the "second type checking print operation" which starts in the printing system **1000** instead of the actual print operation, only a specific page out of all pages to be printed in printing of one set in the actual print operation is printed. In the embodiment, the control unit **205** controls to print a page during printing when a checking print request is input, as described above. Assume that the operator designates the "one page (auto)" key **2302**B in the window **2300**B and then the "start print" key **2304**B. At the timing when the designation of the key **2304**B is input, the control unit **205** instructs the printer unit **203** to start printing of the seventh page of job X in the print operation of the fourth set of job X. In this manner, assume that the control unit **205** reads out print data of the seventh page of job X from the HDD **209**, and issues a paper feed command to the printer unit **203** to feed one print medium used to print the seventh page from the paper feeder. In this case, the control unit **205** controls the printing system **1000** to perform, on one print medium, printing based on only print data of the seventh page

of job X as the second type checking print operation immediately after interrupting the actual print operation of job X. As described above, when the operator designates the keys **2302**B and **2304**B, the control unit **205** confirms the page number subjected to the actual print operation of the job at this time. The control unit **205** controls to print only the confirmed page by the checking print operation. A page printed by the second type checking print operation is automatically determined based on the timing when the operator inputs a checking print request, and the page is printed on one print medium.

[0253] Assume that the operator designates a "cancel" key **2303**B shown in FIG. **9**E. In response to this key operation, the control unit **205** cancels settings associated with the checking print for a job permitted to perform the checking print operation. In this case, the control unit **205** controls the operation unit **204** to end the popup display of the window **2300**B and display the window **2300**A representing the progress of the job again in the touch panel section **401**. For example, in this case, the window **2300**A for job X is displayed again.

[0254] The embodiment has described a configuration in which the control unit **205** automatically specifies a print page subjected to the checking print in the second type checking print operation on the basis of determination made by the control unit **205** itself, and controls to print only the specified page on one print medium. However, the embodiment may also employ another configuration. For example, after the operator designates the key **2302**B, he specifies one arbitrary page out of print data of a job permitted to perform the checking print. In response to the selection of the arbitrary page by the operator and designation of the key **2304**B, the control unit **205** controls to perform printing based on the print data of the arbitrary page designated by the operator on one print medium, and output the page. This configuration is also available. Even in this configuration, the checking print request is issued on condition that the target job is during printing.

[0255] As described above, assume that the operator designates either the key **2301**B or **2302**B in the window **2300**B shown in FIG. **9**E to select the type of checking print, and designates the key **2304**B to input a checking print request. Then, the control unit **205** determines that the operator has input the checking print request. This processing corresponds to a case where YES is determined in step S**117** of FIG. **16**B (to be described later). In response to this, the control unit **205** controls the printing system **1000** to automatically interrupt (stop) the actual print operation of job X. This processing corresponds to a process in step S**121** of FIG. **16**C (to be described later). After interrupting the actual print operation of job X, the control unit **205** controls the printing system **1000** to automatically start a checking print operation of a type selected by the operator in the window **2300**B. This processing corresponds to a process in step S**122** of FIG. **16**C (to be described later). Assume that the printing system **1000** completes (ends) the checking print operation for job X. In response to the end of the checking print operation for job X, the control unit **205** controls the printing system **1000** to automatically resume (continue) the actual print operation of job X. These processes correspond to those in steps S**123** to S**125** of FIG. **16**C (to be described later).

[0256] Assume that the printing system **1000** resumes the actual print operation of the job having undergone the checking print operation. In this case, the control unit **205** controls the printing system **1000** not to print, in the resumed operation, print data which have already been processed immediately before the operator inputs the checking print operation execution request. The control unit **205** controls the printing system **1000** to print only print data (remaining print data) of the job that have not been processed before performing the checking print operation, in the actual print operation automatically resumed in response to the end of the checking print operation.

[0257] For example, job X subjected to the checking print operation is a "job requiring printing of a series of 10-page print data by a total of 100 copies (100 sets)" in the actual print operation. In the above-described example, pages up to the seventh page of the fourth copy (fourth set) have been printed by the actual print operation of job X immediately before the operator inputs a request via the key **2304**B shown in FIG. **9**E to perform the checking print operation for job X. In this case, the control unit **205** controls the printing system **1000** to sequentially perform the following operations as the actual print operation of job X that automatically resumes in response to the end of the checking print operation.

[0258] (1) Print data of the eighth to 10th pages of job X are printed page by page using three print sheets in order to complete printing of the fourth copy (fourth set).

[0259] (2) Printing of up to the 100th set corresponding to the final copy is completed from printing of the fifth set.

[0260] More specifically, printing of 953 sheets as the sum of [three remaining print sheets of the fourth set] and [(10 sheets×95 sets) in printing of the fifth to 100th sets] is performed in the print operation of job X that automatically resumes immediately after the checking print operation of job X.

[0261] When the checking print operation is done in this way in the embodiment, the control unit **205** controls the printing system **1000** to automatically perform the following operations in order.

[0262] [Operation **1**] The control unit **205** causes the printing system **1000** to start the print operation of a target job in response to a print execution request input from the operator using the start key **503**, or if the automatic checking print execution condition is met. This print operation is the actual print operation of a job subjected to the checking print operation. The timing to start this print operation is time T**0** shown in FIG. **8**. [Operation **1**] is the operation of [step **1**] shown in FIG. **8** that is performed by the printing system **1000** during a period immediately before time TX after time T**0** shown in FIG. **8**.

[0263] [Operation **2**] The control unit **205** interrupts the actual print operation of the job in response to a checking print operation execution request input from the operator using the key **2304**B, or if the print status of a job meets the automatic checking print execution condition. Immediately after interrupting the actual print operation, the control unit **205** causes the printing system **1000** to start the checking print operation of the job automatically. In the checking print operation, print processing is performed using print data of the job whose print operation has been interrupted.

[0264] Assume that the operator designates the key **2301**B in the window **2300**B prior to designating the key **2304**B. In this case, the control unit **205** causes the printing system **1000** to perform the first type checking print operation as the checking print operation. To the contrary, assume that the operator designates the key **2302**B in the window **2300**B prior to designating the key **2304**B. In this case, the control unit **205**

causes the printing system **1000** to perform the second type checking print operation as the checking print operation.

[0265] Assume that the operator has designated the key **1705** shown in FIG. **13**B in advance when not the operator inputs an automatic checking print execution request, but the automatic checking print execution condition is met. In this case, the control unit **205** causes the printing system **1000** to perform the first type checking print operation as the checking print operation. When the operator has designated the key **1706** shown in FIG. **13**B in advance, the control unit **205** causes the printing system **1000** to perform the second type checking print operation as the checking print operation.

[0266] The timing to start the checking print is time TX shown in FIG. **8**. The checking print operation in [operation **2**] is the operation of [step **2**] shown in FIG. **8** that is performed during a period immediately before time TY after time TX shown in FIG. **8**.

[0267] [Operation **3**] The control unit **205** causes the printing system **1000** to automatically resume (continue) the actual print operation of the print-interrupted job immediately after the end of the checking print operation. The timing to resume the print operation is time TY shown in FIG. **8**. [Operation **3**] is the operation of [step **3**] shown in FIG. **8** that is performed during a period immediately before the end of the sequence shown in FIG. **8** after time TY shown in FIG. **8**.

[0268] As is apparent from the control sequence shown in FIG. **8**, in the use of the checking print function, the control unit **205** controls the printing system **1000** to continuously perform the print operation of the printing system **1000** without unnecessarily stopping it.

[0269] For example, the control unit **205** allows the printer unit **203** to perform the print operation, like [step **1**] shown in FIG. **8**, during the period from time T**0** to time TX shown in FIG. **8**. The control unit **205** controls the printing system **1000** to be able to maintain (continue) the print operation of the printer unit **203** without stopping it, like [step **2**] shown in FIG. **8**, even during the period from time TX to time TY shown in FIG. **8**. In addition, the control unit **205** controls the printing system **1000** to be able to maintain (continue) the print operation of the printer unit **203** without stopping it, like [step **3**] shown in FIG. **8**, even during the period from time TY shown in FIG. **8** to the end of the sequence shown in FIG. **8**.

[0270] In this manner, the printing system **1000** is configured to be able to continuously perform the print operation in the printing system **1000** without unnecessarily stopping it even when the printing system **1000** performs an operation concerning the checking print function.

[0271] The mechanism associated with the checking print function is also different from the test copy function.

[0272] As described above, when the operator designates the key **2304**B during the actual print operation of job X by the printer unit **203** or the print status of the job meets the automatic checking print execution condition, the control unit **205** interrupts the actual print operation of job X. The control unit **205** causes the printing system **1000** to start the checking print operation of job X at the timing when the actual print operation of job X is interrupted. At the timing when the checking print operation of job X ends, the control unit **205** causes the printing system **1000** to resume (continue) the actual print operation of print-interrupted job X. After the actual print operation of job X is again in execution in this fashion, the control unit **205** causes the touch panel section **401** to automatically display the window **2300**A for job X.

[0273] As described above, when the operator designates the key **2304**B, the control unit **205** controls the touch panel section **401** to automatically end the popup display of the window **2300**B and display the window **2300**A for job X again. For example, the control unit **205** causes the touch panel section **401** to present a display shown in FIG. **9**F at the timing when the actual print operation of job X resumes.

[0274] In the stage in which the touch panel section **401** presents the display shown in FIG. **9**F, the checking print operation of job X has ended, and the print operation of job X has resumed. This stage is a stage in which the printing system **1000** performs the operation of [step **3**] shown in FIG. **8**.

[0275] As described above, assume that the control unit **205** causes the printing system **1000** to resume the print operation of job X automatically in response to the end of the checking print operation of job X. Further, assume that printing of the 10th sheet of the 59th copy (59th set) of job X is in execution now as the progress of the actual print operation of job X that has resumed in the printing system **1000**. In this case, the control unit **205** controls the touch panel section **401** to update the display contents of the window for job X corresponding to a job of acceptance number **0001** to those reflecting the current print progress, as represented by the window **2300**A shown in FIG. **9**F.

[0276] The control unit **205** controls the touch panel section **401** to enable the above-mentioned "checking print" key **2301**A even in the window **2300**A shown in FIG. **9**F that appears again in the touch panel section **401**. Assume that the operator designates the active key **2301**A in the window **2300**A shown in FIG. **9**F. In response to this key operation, the control unit **205** causes the touch panel section **401** to display the checking print type selection window **2300**B shown in FIG. **9**E again.

[0277] Assume that the operator designates the key **2304**B again via the window **2300**B shown in FIG. **9**E that appears again in the touch panel section **401**. In response to the second checking print request input by designating the key **2304**B, the control unit **205** controls the printing system **1000** to sequentially perform the following operations.

[0278] Alternatively, assume that printing of job X proceeds, and the number of print sheets or the print execution time meets the automatic checking print execution condition again. In this case, the control unit **205** controls the printing system **1000** to sequentially perform the following operations in accordance with the automatic checking print execution condition.

[0279] [Operation A**1**] The control unit **205** causes the printing system **1000** to interrupt again the actual print operation of job X that has resumed in the printing system **1000** in response to the end of the first checking print operation of job X.

[0280] [Operation A**2**] Immediately after the print operation of job X is interrupted, the control unit **205** causes the printing system **1000** to perform the second checking print operation of job X. Also in the second checking print operation, print processing is performed using print data of job X whose print operation has been interrupted.

[0281] Assume that the operator has designated the key **2301**B in the window **2300**B prior to inputting the second checking print request by designating the key **2304**B. In this case, the control unit **205** causes the printing system **1000** to perform the first type checking print operation as the second checking print operation. To the contrary, assume that the operator has designated the key **2302**B in the window **2300**B

prior to inputting the second checking print request by designating the key **2304**B. In this case, the control unit **205** causes the printing system **1000** to perform the second type checking print operation as the second checking print operation.

[0282] Similar to a checking print execution request via a key, if the operator has designated the key **1705** shown in FIG. **13**B in advance when performing the checking print automatically, the control unit **205** causes the printing system **1000** to perform the first type checking print operation. If the operator has designated the key **1706** shown in FIG. **13**B in advance, the control unit **205** causes the printing system **1000** to perform the second type checking print operation.

[0283] [Operation A**3**] The control unit **205** causes the printing system **1000** to automatically resume (continue) the actual print operation of job X immediately after the end of the second checking print operation for job X. In this fashion, the second print resume operation of job X having undergone the checking print operation twice is done.

[0284] In the actual print operation of job X that resumes in [operation A**3**], the control unit **205** controls to print not print data which have been processed immediately before the start of [operation A**2**], but print data which have not been processed immediately before the start of [operation A**2**]. Assume that the operator inputs the second checking print request for job X via the key **2304**B immediately after the display shown in FIG. **9**F, or the print progress of job X meets the automatic checking print execution condition. In this case, pages up to the 10th page of the 59th copy of job X corresponding to a job requiring printing of a series of 10-page print data by a total of 100 sets have already been printed. Thus, in this case, the control unit **205** controls to print the 60th to 100th sets of job X as [operation A**3**].

[0285] On condition that the actual print operation of a print-resumed job has not been completed yet and is in execution now, the control unit **205** controls the operation unit **204** to permit accepting a checking print request again from the operator for the job. The control unit **205** also controls to resume determining whether to perform the checking print automatically. Assume that the operator inputs a checking print request again, or the print progress of the job meets the automatic checking print execution condition. In this case, the control unit **205** causes the printing system **1000** to perform again the above-described series of processes (i.e., interruption of the actual print operation, the checking print of a job, and resume of the actual print operation of the job) for a job whose checking print has been performed again.

[0286] As described above, as long as the actual print operation is in progress, the control unit **205** permits repetitively accepting a checking print request for the job from the operator. The control unit **205** controls the printing system **1000** to be able to perform the checking print operation of the job repetitively every time the checking print request is input. Even in the second mode (manual mode), the control unit **205** controls to be able to repetitively perform the checking print available to change the printing result and/or processing condition of a job in response to an explicit instruction from the user during the period till the completion of the job.

[0287] The control unit **205** controls the printing system **1000** to determine an automatic checking print execution condition and if the condition is satisfied, repetitively perform the checking print. Even in the first mode (automatic mode), the control unit **205** controls to be able to repetitively perform the checking print available to change the printing result and/or processing condition of a job without any explicit instruction from the user as long as the condition is satisfied during the period till the completion of the job.

[0288] Assume that the target job requires as many as 5,000 sheets, and the automatic checking print execution condition is every 20 min. In this case, for example, when the 1,000th sheet is printed, the operator performs the first checking print for the job. Then, when 1,500 sheets are printed, 20 min has elapsed after the start of printing, so the second checking print is performed in accordance with the automatic checking print execution condition without any execution request from the operator. When the 2,500th sheet is printed, the operator performs the third checking print for the job. Subsequently, when 3,000 sheets are printed, 40 min has elapsed after the start of printing, so the fourth checking print is performed in accordance with the automatic checking print execution condition without any execution request from the operator. Further, when the 4,000th sheet is printed, the operator performs the fifth checking print for the job. Finally, when 4,500 sheets are printed, 60 min has elapsed after the start of printing, so the sixth checking print is performed in accordance with the automatic checking print execution condition without any execution request from the operator.

[0289] In this way, the control unit **205** can control the printing system **1000** to periodically perform the checking print operation over and over even for a single job. Accordingly, for example, the operator can periodically check, without missing the checking print execution timing, whether the result of print materials output by the actual print operation of a job requiring large-volume printing is proper, like a sampling check, while the print operation continues. The operator can also periodically check, without decreasing productivity, whether the density of output results, the print position, or the like has changed while printing continues. For example, if the output results of actual print materials of a job requiring printing of a large number of sheets have changed, the printing conditions can be quickly changed to continue the print operation. This can provide an effect capable of preventing generation of the following problems:

[0290] (1) a problem that the operator notices that the output results of print materials have changed halfway only after inspecting all the printing results of a job requiring large-volume printing upon completion of all the actual print operation of the job.

[0291] (2) a problem that the operator performs the actual print operation of the job again from the beginning upon completion of all the actual print operation because problem (1) occurs. In addition, a problem as the waste of resources and a dead work time more than necessary due to the first problem in (2) such that resources are used more than necessary or an unnecessarily long work time is needed.

[0292] (3) a problem that the operator must always stay at the printing system in order to always inspect output results during output of a large-volume job though he checks the printing result of the job by the checking print. Another problem is that it is cumbersome when the operator must be aware of the timing to perform the checking print during output of a large-volume job.

[0293] Further in the embodiment, the control unit **205** controls the printing system **1000** to be able to selectively accept a plurality of types of requests including, e.g., at least one of the following requests (1) to (4) as an operator request permitted to be accepted from the operator immediately after performing the checking print operation.

[0294] [Operator Request (**1**) Control Unit **205** Permits to Accept Immediately After Performing Checking Print]

[0295] Request (**1**) is an operator request to suspend the actual print operation of a job that has resumed after performing the checking print operation.

[0296] The control unit **205** allows accepting request (**1**) from the operator via the operation unit **204** while the printing system **1000** resumes the actual print operation of a job having undergone the checking print. Upon accepting request (**1**), the control unit **205** controls the printing system **1000** to suspend the actual print operation. In this case, while the job is suspended, the control unit **205** controls the operation unit **204** to allow the operator to change a system-specific processing condition which influences the output results of the job and the printing results of another queued subsequent job. After the operator changes the processing condition, the control unit **205** controls the printing system **1000** to resume the actual print operation of the job under the changed processing condition. Upon completion of the print operation of the job, the control unit **205** controls the printing system **1000** to start, under the changed processing condition, the actual print operation of another queued subsequent job whose print data have been stored in the HDD **209**.

[0297] In this manner, after performing the checking print of one job, the control unit **205** allows the operator to change (adjust) a print processing condition which is associated with a processing condition specific to the printing system **1000**, and is a processing parameter influencing the output results of jobs including the job having undergone the checking print. "Influencing the output results of jobs including a job having undergone the checking print" means "common to a plurality of jobs". The control unit **205** allows the printing system **1000** to continuously perform the print operations of these jobs under the changed processing condition.

[0298] A concrete example of control based on request (**1**) will be explained using the above-described job X.

[0299] Assume that the actual print operation of job X has resumed now, and the print operation is in execution in the printing system **1000**. When the print operation of job X has resumed, the operator visually checks the result of a checking print material of job X that has been output by the above-described checking print operation. Assume that as a result of visually checking the output result of the checking print material of job X, the operator determines that the processing condition specific to the printing system **1000** needs to be changed.

[0300] In this state, the control unit **205** controls the touch panel section **401** to enable a "system monitor" key **2301** even while the window **2300**A is kept displayed, as shown in FIG. **9**F.

[0301] In this state, assume that the operator designates the key **2301**. In response to the operation of the key **2301**, the control unit **205** causes the touch panel section **401** to display a window shown in FIG. **10**A while the printing system **1000** continues the actual print operation of job X.

[0302] The control unit **205** controls the touch panel section **401** to display the display contents based on the following information in a window **2400**A shown in FIG. **10**A.

[0303] (Information **1**) Information **1** is system configuration information of the printing system **1000**. This information notifies the operator of, for example, the number, types, and connection order of sheet processing apparatuses connected to the printing apparatus **100**.

[0304] (Information **2**) Information **2** is information of jobs which include a job during printing and a queued job, have print data stored in the HDD **209**, and are to be printed by the printer unit **203**. For example, information **2** includes information on the acceptance number, acceptance time, job name (job type), user name, and status.

[0305] Based on (information **1**) and (information **2**), the control unit **205** controls the touch panel section **401** to display device information graphically representing the appearance of the printing system **1000** in the window **2400**A, as shown in FIG. **10**A.

[0306] Also based on (information **1**) and (information **2**), the control unit **205** controls the touch panel section **401** to display a job list at an upper portion in the display area of the window **2400**A, as shown in FIG. **10**A.

[0307] When displaying the job list, the control unit **205** displays pieces of information of jobs in the job list in distinction from each other. These jobs have print data stored in the HDD **209** and require the print operation by the printer unit **203**. These jobs include a job during printing and a queued job.

[0308] The control unit **205** controls the order of jobs displayed in the job list in the window **2400**A so that it coincides with the order of print execution requests accepted from the operator. That is, the control unit **205** displays pieces of information of jobs in the list in the same order as the order of processes by the printing system **1000**.

[0309] The job list in the window **2400**A is configured to allow the operator to select a desired one of jobs displayed in the job list in response to an operation by the operator to the touch panel section **401**. When the operator touches the display line of any job among a plurality of jobs in the job list shown in FIG. **10**A, the control unit **205** determines that the operator has selected the job.

[0310] When the operator selects a desired job from the job list in the window **2400**A, the control unit **205** controls the touch panel section **401** to highlight the display line of the selected job so that the operator can specify the selected job. For example, in the display state of FIG. **10**A, the operator selects job X.

[0311] The window **2400**A further comprises the following display building elements.

[0312] The print suspension key **2401**A is a display key which allows the operator to input an instruction to suspend the print operation of a job (job which requires the print operation by the printer unit **203** and whose printing has not been completed yet) selected from the job list in the window **2400**A.

[0313] The control unit **205** controls the printing system **1000** to cancel the suspension of the print operation-suspended job and resume the print operation later in accordance with an instruction from the operator.

[0314] In the embodiment, when the operator inputs a print suspension instruction via the key **2401**A, the control unit **205** can lock the start of performing the print operations of all jobs displayed in the job list of the window **2400**A.

[0315] The control unit **205** may also control to lock (suspend) only the print operation of a job selected by the operator from the job list. Assume that the operator selects job X in the display state of FIG. **10**A and designates the key **2401**A. In this case, the control unit **205** may also control the printing system **1000** to suspend only the print operation of job X and perform the print operations of subsequent queued jobs such as jobs Y and Z.

[0316] When the operator does not designate the key **2401**A, the control unit **205** causes the printer unit **203** to continue the print operation of a job (job X in this example) whose print operation is in execution, while causing the touch panel section **401** to keep displaying the window **2400**A.

[0317] Even in this state, the control unit **205** updates the display of the display field **2300** in correspondence with the progress of the job, as needed, in order to notify the operator in real time of information on the job during printing. For example, printing of the fourth set in printing of 100 sets of job X is in execution in the stage of the display shown in FIG. **9**D. However, job X progresses in the stage of the display shown in FIG. **9**F.

[0318] Assume that the operator designates the key **2401**A in the window **2400**A shown in FIG. **10**A. In response to the designation of the key **2401**A, the control unit **205** causes the touch panel section **401** to popup-display a window **2400**B exemplified in FIG. **10**B.

[0319] The window **2400**B is a print suspension confirmation window configured to allow the operator to determine whether to suspend the print operation of a job in progress.

[0320] Assume that the operator designates a key **2402**B in the window **2400**B. In this case, the control unit **205** controls the touch panel section **401** to end the display of the window **2400**B and return to the display shown in FIG. **10**A without stopping the print operation of job X in execution.

[0321] To the contrary, assume that the operator designates a key **2401**B in the window **2400**B. In this case, the control unit **205** stops the print operation of job X in execution. Accordingly, the control unit **205** suspends the print operation of job X.

[0322] Assume that the print operation by the printer unit **203** is suspended by the above-described method. In this state, assume that the operator designates the user mode key **505** of the operation unit **204**. In response to this key operation, the control unit **205** causes the touch panel section **401** to present the window **2400**C exemplified in FIG. **10**C.

[0323] The window **2400**C is a display window which allows the operator to change, in accordance with an instruction from him, processing conditions which commonly influence the printing result of one job printed by the printer unit **203** and those of other jobs. The window **2400**C is used to cause the printing system **1000** to clean a plurality of units of the printing system **1000** including the printing apparatus **100**.

[0324] Assume that the operator designates a "creep (deviation) correction amount adjustment" key **2490** in the window **2400**C while the actual print operation of the above-described job X is suspended. In response to this operation, the control unit **205** causes the touch panel section **401** to display a creep correction amount adjustment window (not shown).

[0325] The creep correction amount adjustment window (not shown) is a display window configured to allow the operator to input an instruction to finely adjust the print position, on a print medium (print sheet), of an image to be printed on a print medium. This window (not shown) is also a display window configured to allow the operator to explicitly input a print image shift amount (creep correction amount) and the like.

[0326] The control unit **205** accepts the print position correction amount of an image on a print medium from the operator via the creep correction amount adjustment window (not shown). In the embodiment, the correction amount is a print processing condition specific to the printing system **1000**. In the embodiment, this print processing condition is a parameter common to not only one job to be printed by the printer unit **203** but also other jobs.

[0327] Assume that the operator changes the "creep correction amount" via the creep correction amount adjustment window (not shown), and then inputs an instruction to resume the print operation of job X. When suspension of the print operation of job X is canceled to resume the print operation of job X, the control unit **205** sequentially performs the following exemplary processes.

[0328] First, the control unit **205** controls print processing of the printing apparatus **100** to adjust the print position of the print image of print data of job X on a print medium to a print position complying with the changed creep correction value.

[0329] Then, the control unit **205** controls print processing of the printing apparatus **100** to adjust the print position of the print image of print data of job Y on a print medium to a print position complying with the changed creep correction value also in the print operation of job Y subsequent to job X.

[0330] Further, the control unit **205** controls print processing of the printing apparatus **100** to adjust the print position of the print image of print data of job Z on a print medium to a print position complying with the changed creep correction value also in the print operation of job Z subsequent to job Y.

[0331] The control unit **205** controls the printing apparatus **100** to automatically start the print operation of job Y in accordance with the setting-changed correction value upon completion of the print operation of job X in accordance with the creep correction value whose setting has been changed by the operator via the window **2400**C. The control unit **205** controls the printing apparatus **100** to automatically start the print operation of job Z in accordance with the setting-changed correction value upon completion of the print operation of job Y. In this way, the control unit **205** controls the printing system **1000** to automatically, successively process all target jobs while reflecting the correction value whose setting has been changed by the operator.

[0332] The printing system **1000** according to the embodiment is configured to deal with parameters in addition to the above-described one as "print processing conditions concerning the print operations of jobs", for which the operator is permitted to change settings after performing the checking print.

[0333] Assume that the operator designates a "density correction" key **2491** in the window **2400**C while the actual print operation of job X is suspended. In response to this operation, the control unit **205** causes the touch panel section **401** to display a density correction window (not shown).

[0334] The density correction window (not shown) is a display window configured to allow the operator to input an instruction to finely adjust the print density of an image to be printed on a print medium (print sheet). This window (not shown) is a display window configured to allow the operator to explicitly input a print image density and the like.

[0335] Assume that the operator changes the density setting in the density correction window (not shown) to be higher than the print density of the image of print data of job X on a print medium in the checking print operation performed for job X. Then, assume that the operator inputs an instruction to resume the print operation of job X. When suspension of the print operation of job X is canceled to resume the print operation of job X, the control unit **205** sequentially performs, for example, the following exemplary job processes.

[0336] First, the control unit **205** controls print processing of the printing apparatus **100** to adjust the print density of the print image of print data of job X on a print medium to a print density complying with the changed density value (density correction value).

[0337] Then, the control unit **205** controls print processing of the printing apparatus **100** to adjust the print density of the print image of print data of job Y on a print medium to a print density complying with the changed density value even in the print operation of job Y subsequent to job X.

[0338] Further, the control unit **205** controls print processing of the printing apparatus **100** to adjust the print density of the print image of print data of job Z on a print medium to a print density complying with the changed density value even in the print operation of job Z subsequent to job Y.

[0339] As described above, also when the operator changes the setting of the print density via the window **2400**C shown in FIG. **10**C, the control unit **205** processes a plurality of jobs, similar to the above-described case. That is, the control unit **205** controls the printing system **1000** to automatically, successively process all jobs to be printed including jobs X, Y, and Z in accordance with the print density whose setting has been changed by the operator.

[0340] There are other print processing conditions concerning the print operations of jobs, in addition to processing conditions such as the "creep correction value" and "density correction value" described above. Other print processing conditions include "print processing conditions concerning automatic tone correction" and "processing conditions concerning text/background contrast adjustment". The control unit **205** also controls to allow the operator to change these print processing conditions via windows (not shown) displayed in the touch panel section **401** in response to operator operations to an "automatic tone correction" key **2492**, "text/background contrast adjustment" key **2493**, and the like.

[0341] In the embodiment, the control unit **205** can further accept an instruction from the operator via the window **2400**C to perform the following exemplary cleaning by the printing system **1000**.

[0342] (Feeder Cleaning) This processing cleans the document feed unit of the auto document feeder (ADF) **301** in the scanner unit **201**. A concrete example of performing this processing will be explained.

[0343] Assume that the operator designates a "feeder cleaning" key **2494** in the window **2400**C while the actual print operation of job X is suspended. In response to this key operation, the control unit **205** causes the touch panel section **401** to display a feeder cleaning execution window (not shown) which allows the operator to input an instruction to start feeder cleaning by the ADF **301**.

[0344] The feeder cleaning execution window (not shown) is a display window configured to present a guidance message such as "set about 10 blank sheets on the feeder and press the 'start' key" to the operator. This window (not shown) has a "start" key to cause the ADF **301** to clean the feeder.

[0345] Assume that the operator sets blank sheets for dirt removal on the document tray of the ADF **301** and designates the start key (not shown) in accordance with the guidance message. In response to this key operation, the control unit **205** causes the ADF **301** to feed the blank sheets. The ADF **301** successively feeds the blank sheets by document feed rollers. As a result, dirt such as powder of a pencil attached to the document feed rollers of the ADF **301** is removed from the document feed rollers and attaches to the blank sheets. By successively feeding a specific number of blank sheets for dirt removal, dirt is removed from the document feed rollers.

[0346] In the embodiment, the processing to cause the printing system **1000** to clean the feeder also falls within processing to change print processing conditions specific to the printing system **1000**.

[0347] The control unit **205** controls the printing system **1000** to resume the print operation of job X and successively process a plurality of jobs including job X and subsequent jobs Y and Z after cleaning the feeder.

[0348] In the embodiment, the control unit **205** can accept an instruction from the operator via the window **2400**C to perform the following exemplary cleaning by the printing system **1000**.

[0349] (Wire Cleaning) This processing cleans a wire unit (not shown) in the printer unit **203**. A concrete example of performing this processing will be explained.

[0350] Assume that the operator designates a "wire cleaning" key **2495** in the window **2400**C while the actual print operation of job X is suspended. In this case, the control unit **205** causes the touch panel section **401** to display a wire cleaning execution window (not shown) which allows the operator to input an instruction to start this cleaning by the printer unit **203**.

[0351] The wire cleaning execution window (not shown) has a "start" key (not shown) to cause the printer unit **203** to clean the wire unit in the printer unit **203**.

[0352] Assume that the operator presses the start key (not shown). In response to this, the control unit **205** causes the printer unit **203** to clean the wire unit (not shown) in the printer unit **203**.

[0353] In the embodiment, the "processing to clean the wire unit (not shown) in the printer unit 203" also falls within processing to change print processing conditions specific to the printing system **1000**.

[0354] The control unit **205** controls the printing system **1000** to resume the print operation of job X and successively process a plurality of jobs including job X and subsequent jobs Y and Z after cleaning the wire unit in the printer unit **203**.

[0355] In addition to the above-mentioned cleaning processes, there is an item to clean the conveyance rollers of the printer unit **203** for conveying a print sheet. For example, when a "roller cleaning" key (not shown) is arranged in the window **2400**C and the operator designates this key, the control unit **205** causes the printer unit **203** to clean the conveyance rollers in the printer unit **203**. In the embodiment, the processing to clean the conveyance rollers also falls within processing to change print processing conditions specific to the printing system **1000**. The control unit **205** controls the printing system **1000** to resume the print operation of job X and successively process a plurality of jobs including job X and subsequent jobs Y and Z after cleaning the conveyance rollers in the printer unit **203**.

[0356] In the embodiment, assume that change of the above-mentioned print processing conditions is completed in accordance with an instruction accepted from the operator via the window **2400**C while the print operation of job X is suspended. Then, assume that the operator designates the "system monitor" key **2301**. In this case, the control unit **205** causes the touch panel section **401** to present the window **2400**D exemplified in FIG. **10**D while keeping the actual print operation of job X suspended.

[0357] As shown in FIG. **10**D, the control unit **205** causes the touch panel section **401** to popup-display the window **2400**D while the display field **2300** displays information that the print operation of job X is suspended.

[0358] The window **2400**D is a display window configured to allow the operator to determine whether to cancel the suspension of the print operation in the printing system **1000** and resume the print operation by the printer unit **203**.

[0359] Assume that the operator designates a key **2402**D in the window **2400**D. In this case, the control unit **205** ends the display of the window **2400**D without resuming the print operation by the printer unit **203** while keeping the print operation suspended. The control unit **205** causes the touch panel section **401** to display, e.g., the window **2400**A again. The control unit **205** controls the touch panel section **401** to represent, in the job list of the window **2400**A, that the print operation of job X is suspended.

[0360] In contrast, assume that the operator designates the key **2401**D in the window **2400**D. In this case, the control unit **205** cancels the suspension of the print operation in the printing system **1000**, and causes the printer unit **203** to resume the print operation. By this control, the control unit **205** causes the printing system **1000** to resume the actual print operation of job X.

[0361] Assume that the operator has changed, via the window **2400**C, print processing conditions commonly concerning the print operations of jobs including job X before the operator inputs an instruction via the key **2401**D in the window **2400**D. In response to the instruction from the user via the key **2401**D, the control unit **205** causes the printing system **1000** to resume the actual print operation of job X. At this time, the control unit **205** causes the printing system **1000** to perform a print operation complying with the setting-changed print processing conditions accepted before the instruction from the user via the key **2401**D. Upon completion of all the printing of job X, the control unit **205** causes the printing system **1000** to perform the print operation of job Y. Also in the print operation of job Y, the control unit **205** causes the printing system **1000** to perform a print operation complying with the setting-changed print processing conditions. Upon completion of all the printing of job Y, the control unit **205** causes the printing system **1000** to perform the print operation of job Z. Also in the print operation of job Z, the control unit **205** causes the printing system **1000** to perform a print operation complying with the setting-changed print processing conditions.

[0362] Note that various print processing conditions subjected to setting change in the window **2400**C are all exemplary.

[0363] As described above, after the operator checks the output result of a checking print material by the checking print operation, the control unit **205** can accept a change of print processing conditions concerning the print operations of not only a job having undergone the checking print but also other jobs. Then, the control unit **205** can cause the printing system **1000** to print a plurality of jobs under the setting-changed print processing conditions.

[0364] In the embodiment, the printing system **1000** is configured to be able to change only print processing conditions specific to a job having undergone the checking print operation.

[0365] For example, the control unit **205** controls the touch panel section **401** to display the window **2300**A again while the printing system **1000** resumes and continues the actual print operation of job X performing the checking print, as described with reference to FIG. **9**F. The window **2300**A, which can repetitively appear as long as the actual print operation is in execution, has a display key to select the print density.

[0366] Assume that the operator designates a print density adjustment key **2301**D in the redisplayed window **2300**A shown n FIG. **9**F while the actual print operation of job X is resumed and continues.

[0367] In this manner, assume that the operator requests a change of the print density for job X during the resume operation for the print operation of job X. In this case, the control unit **205** controls the printing system **1000** to change the print density midway along a series of print steps of job X and continue the actual print operation of job X without stopping the actual print operation of job X. For example, the control unit **205** controls the printing system **1000** to print the print image of job X on a print medium at the changed print density at the timing when the image of job X is printed on a print medium fed from the paper feed unit immediately after the operator designates the print density adjustment key **2301**D.

[0368] In this manner, the control unit **205** controls to automatically change the print density midway along a series of print steps in the actual print operation of job X in accordance with a print density change instruction accepted via the window **2300**A.

[0369] The control unit **205** causes the printer unit **203** to start the print operation of job Y automatically after the actual print operation of job X ends. In this case, the control unit **205** controls the printing system **1000** to perform print processing based on a print density set by the operator for job Y in the print operation of job Y.

[0370] The control unit **205** causes the printer unit **203** to start the print operation of job Z automatically after the actual print operation of job Y ends. Also in this case, the control unit **205** controls the printing system **1000** to perform print processing based on a print density set by the operator for job Z in the print operation of job Z.

[0371] As described above, the operator can also change job-specific print processing conditions concerning a job having undergone the checking print operation but not concerning other jobs. The control unit **205** controls the printing system **1000** to perform the print operation upon changing only the settings of the print processing conditions of only the target job, and automatically process subsequent jobs in order in their print operations under job-specific printing conditions independently of the setting change.

[0372] The printing system **1000** according to the embodiment is also configured to meet the following request in addition to request (**1**).

[0373] [Operator Request (**2**) Control Unit **205** Permits to Accept Immediately After Performing Checking Print]

[0374] Request (**2**) is an operator request to stop (cancel) the actual print operation of a job whose actual print operation has resumed after performing the checking print operation.

[0375] Upon receiving request (**2**), the control unit **205** quickly stops the actual print operation of a job whose actual print operation has started immediately after performing the checking print operation.

[0376] A concrete example of request (**2**) will be described.

[0377] Assume that the actual print operation of job X that has resumed after the end of the checking print operation is in execution in the printing system **1000**. In this state, assume

that the operator selects a job of acceptance number **0001** corresponding to job X from the job list in the window **2400**A. In this case, the control unit **205** highlights the display line of the job information. Then, assume that the operator selects job X from the job list and designates a stop key **2403**A in the window **2400**A. In response to this key operation, the control unit **205** causes the touch panel section **401** to display the window **2400**F shown in FIG. **10**E.

[0378] When the operator designates the stop key **2403**A, the control unit **205** causes the touch panel section **401** to popup-display the window **2400**F while the display field **2300** keeps displaying a message that job X is during printing, as shown in FIG. **10**E.

[0379] The window **2400**F is a display window configured to allow the operator to determine whether to cancel the print operation of a job (job X in this example) in execution.

[0380] Assume that the operator designates a key **2402**F in the window **2400**F. In this case, the control unit **205** causes the touch panel section **401** to end the display of the window **2400**F while maintaining the print operation of job X in execution. The control unit **205** causes the touch panel section **401** to display the window **2400**A again.

[0381] Assume that the operator designates the key **2401**F in the window **2400**F. In this case, the control unit **205** controls the printing system **1000** to stop the print operation of job X in execution. As the job stop processing, for example, the control unit **205** controls the printing system **1000** to perform all the following exemplary processes as the job stop process.

[0382] (Stop Processing **1**) The control unit **205** controls the printing apparatus **100** to stop the print operation of job X.

[0383] (Stop Processing **2**) The control unit **205** controls the printing apparatus **100** to erase 10-page print data of job X from the HDD **209**.

[0384] (Stop Processing **3**) The control unit **205** controls the touch panel section **401** to delete job information of job X from the job list in the window **2400**A.

[0385] As described above, when the operator uses the key **2401**F to input an instruction to stop processing for job X, the control unit **205** controls the printing system **1000** to perform the stop processing (cancel processing) including (stop processing **1**) to (stop processing **3**). When the operator designates the key **2401**F, the control unit **205** further performs the following control operations.

[0386] (Control **1**) The control unit **205** controls the printing apparatus **100** so that the printer unit **203** automatically starts the print operation of job Y immediately after performing the above-mentioned cancel processing for job X. The control unit **205** controls the touch panel section **401** to update the display contents of system configuration information in the window **2400**A, and reflect and display the start of the print operation of job Y in the job list.

[0387] (Control **2**) The control unit **205** controls the printing apparatus **100** so that the printer unit **203** automatically starts the print operation of job Z upon completion of the print operation of job Y. The control unit **205** controls the touch panel section **401** to update the display contents of the window **2400**A, and reflect and display the completion of the print operation of job Y and the start of the print operation of job Z in the job list.

[0388] Assume that the actual print operation of job X stops. In this case, for example, it is also possible to return the display to one shown in FIG. **5** or **9**A, and set printing conditions for job X from the beginning. It is also possible to input job X again as a job requiring a print operation complying with the changed print processing conditions, and perform the print operation.

[0389] In this case, the control unit **205** controls the printing system **1000** to process job X input again after the processes of jobs Y and Z.

[0390] The printing system **1000** according to the embodiment is configured to meet even the following request in addition to request (**2**).

[0391] [Operator Request (**3**) Control Unit **205** Permits to Accept Immediately After Performing Checking Print]

[0392] Request (**3**) is an operator request to cause the touch panel section **401** to display detailed information on the actual print operation of a job whose actual print operation has resumed after performing the checking print operation.

[0393] The printing system **1000** according to the embodiment is configured to meet even the following request in addition to request (**3**).

[0394] [Operator Request (**4**) Control Unit **205** Permits to Accept Immediately After Performing Checking Print]

[0395] Request (**4**) is an operator request to perform the checking print of a job again while performing the actual print operation of the job that has resumed after performing the checking print operation.

[0396] A concrete example of request (**4**) has already been described in detail with reference to FIG. **9**F, and a description thereof will not be repeated.

[0397] As exemplified with reference to FIGS. **10**A to **10**E, the control unit **205** can selectively accept the above-described four types of requests from the operator via the operation unit **204** immediately after causing the printing system **1000** to perform the checking print operation. The control unit **205** can selectively accept these four types of requests from the operator via the operation unit **204** while the actual print operation of a job having undergone the checking print operation resumes. Upon accepting one of these requests, the control unit **205** controls the printing system **1000** of the embodiment including the printing apparatus **100** to perform processing and an operation complying with the accepted request.

[0398] As described with reference to FIG. **9**F, the control unit **205** accepts a checking print request repetitively from the operator for a job during printing, and determines the automatic checking print execution condition as long as the print operation of the job continues. However, the control unit **205** inhibits accepting a checking print request from the operator for a job not during printing, and does not determine the automatic execution condition.

[0399] Assume that the control unit **205** causes the touch panel section **401** to display the window **2400**A shown in FIG. **10**A in response to an instruction via the key **2301** while the printing system **1000** continues the actual print operation of job X.

[0400] Then, assume that the operator selects a job of acceptance number **0001** corresponding to job X from the job list in the window **2400**A while the actual print operation of job X is in execution. In this case, the control unit **205** highlights the display line of the job information in the job list.

[0401] In this manner, assume that the operator selects the job of acceptance number **0001**, i.e., job X during printing in the window **2400**A. In this case, the control unit **205** controls the touch panel section **401** to enable a key **2404**A in the window **2400**A, as shown in FIG. **10**A. When the operator designates the key **2404**A, the control unit **205** controls the

touch panel section **401** to display the window **2300**B shown in FIG. **9**E again. When the operator inputs a checking print request for job X again via the key **2304**B, the control unit **205** causes the printing system **1000** to interrupt the actual print operation of job X again and perform the second checking print of job X, as described above. The control unit **205** can accept a checking print request from the operator via the window **2400**A. As a result, the checking print operation can be performed a plurality of number of times for a single job without using the redisplayed window **2300**A, as described with reference to FIG. **9**F.

[0402] Assume that the operator selects a job not during printing from the job list in the window **2400**A. For example, the operator selects job Y of acceptance number **0002** from the job list in the window **2400**A. When the operator selects the queued job in the window **2400**A, the control unit **205** controls the touch panel section **401** to disable the key **2404**A in the window **2400**A. As described above, when the operator selects a job not during printing via the operation unit **204**, the control unit **205** controls the operation unit **204** to inhibit accepting a checking print request from the operator for the selected job. The control unit **205** controls the printing system **1000** to neither interrupt the print operation of job X nor perform the checking print operation of outputting the print materials of jobs Y and Z.

[0403] As described with reference to FIGS. **10**A to **10**E and the like, the configuration relevant to the checking print function of the printing system **1000** according to the embodiment has the following effects. More specifically, the operator can quickly, visually check a checking print material output by the checking print function for a job during printing in the printing system **1000**. Even when the sheet feeding path in the printing system **1000** becomes long upon connecting a plurality of sheet processing apparatuses to the printing apparatus **100** as shown in FIG. **3**, the operator can quickly, easily determine a job in progress and an image during printing. Even when the output destination of the print materials of a job during printing is an output destination inside a sheet processing apparatus such as the large-volume stacker or glue binding apparatus, the operator can quickly, easily determine a job in progress and an image during printing. In addition, all the processes can be periodically executed without bothering the operator to be aware of the timings to perform them. Even while the operator checks a checking print material, the printing system **1000** can continue the print operation without stopping it. Hence, the print operation can continue without unnecessarily decreasing high operating ratio of the printing system **1000**.

[0404] The control unit **205** controls the printing system **1000** to complete a plurality of jobs after changing print processing conditions concerning a plurality of print jobs including a job subjected to the checking print operation and subsequent jobs, as described with reference to FIG. **10**C. The embodiment can, therefore, provide an effect capable of building a printing environment where the qualities of the printing results of all jobs do not unnecessarily degrade even if no processing condition is changed individually for each job. The printing system **1000** is configured to be able to quickly cancel the actual print operation of job X when the checking printing result is undesirable, as described with reference to FIG. **10**E and the like. As an effect obtained by the checking print operation, effects specific to a job subjected to the checking print operation can also be attained. A wasteful output can be suppressed as much as possible even in a printing environment where it is important to process a plurality of jobs at productivity as high as possible.

[0405] The control unit **205** causes the touch panel section **401** to present the window **2300**A configured to be able to display the key **2301**A while the actual print operation is in execution in [step **1**] shown in FIG. **8**.

[0406] Assume that the operator designates the active key **2301**A as in the window **2300**A shown in FIG. **9**D in the touch panel section **401** while printing of a target job is in progress. In step S**115** of FIG. **16**B (to be described later), the control unit **205** determines, based on whether the operator has designated the active key **2301**A, whether the control unit **205** has accepted a checking print request from the operator.

[0407] When the control unit **205** determines that the operator has designated the key **2301**A, it causes the touch panel section **401** to display the window **2300**B for selecting the type of checking print, as shown in FIG. **9**E. This corresponds to a case where the control unit **205** determines YES in step S**115** of FIG. **16**B and advances the process to step S**116**.

[0408] The state in which the touch panel section **401** displays the window **2300**B is the stage of [step **1**] in FIG. **8**, i.e., a state in which the actual print operation of a job subjected to the checking print operation continues.

[0409] Assume that the operator designates either the key **2301**B or key **2302**B, and then the key **2304**B in the window **2300**B. This corresponds to a case where the control unit **205** determines YES in step S**117** of FIG. **16**B.

[0410] As described above, in response to a checking print start instruction input when the operator designates the key **2304**B, the control unit **205** interrupts the actual print operation in execution in the printing system **1000** for a job subjected to the checking print. Upon completion of interrupting the actual print operation, the control unit **205** causes the printing system **1000** to automatically start a checking print of a type corresponding to either the key **2301**B or **2302**B designated by the operator.

[0411] In the embodiment, when interrupting the actual print operation, the control unit **205** controls the printing system **1000** to perform, for example, the following control as the actual print operation interruption processing.

[0412] Assume that feed of print materials from the paper feed unit of the printing system **1000** for the actual print operation has already started upon receiving a checking print start instruction. In this case, the control unit **205** controls the printer unit **203** to print all the fed actual print materials. Further, the control unit **205** controls to discharge all the actual print materials of the printed job to the output destination (delivery destination) of a sheet processing apparatus used to hold the final product of the job. Then, the control unit **205** controls to hold the final product at the output destination.

[0413] In this manner, the control unit **205** causes the printing system **1000** to perform the above-described interruption processing if the printing system **1000** has already started feeding actual print materials when the operator inputs a checking print request or the automatic checking print execution condition is met.

[0414] The control unit **205** permits feeding a checking print medium for the job from the paper feed unit of the printing system **1000** even when all the actual print materials, feed of which has already started in the former or latter case, have not been discharged yet to the output destination of actual print materials.

[0415] This can prevent any delay of the checking print execution timing even if the print medium feeding path is long to some extent in the printing system **1000**, as shown in FIG. **3**.

[0416] The printing system **1000** according to the embodiment is configured to be able to start the checking print before the completion of discharging, to the output destination in the printing system **1000**, all actual print materials which have already been fed upon receiving a checking print request. This can prevent generation of a trouble such as a delay of the timing when output of a checking print material is completed due to a trouble such as a delay of the checking print start timing. This can also prevent generation of a trouble such as the influence on the productivity of all jobs including not only a target job but also subsequent jobs due to a delay of the timing when the operator visually checks a checking print material or a delay of the timing when the actual print operation resumes, which delays are caused by the above-mentioned trouble.

[0417] In this manner, the control unit **205** controls the printing system **1000** to feed a checking print material from the paper feed unit even if feed of actual print materials has already started upon receiving a checking print start instruction and not all the actual print materials have been discharged to the output destination.

[0418] As a concrete example, the system configuration in FIG. **3** will be exemplified. Assume that the target job is a job whose print materials by the actual print operation are to be discharged to output destination Z of the saddle stitching apparatus **200-3***c* in FIG. **3**. Assume that feed of the actual print materials of the job from the paper feed deck **319** has just started upon receiving a checking print start instruction.

[0419] In this case, for example, after confirming that actual print materials, feed of which has already started, have passed through point A in FIG. **3**, the control unit **205** controls the printing apparatus **100** so that the operator takes out the checking print material of the job from the paper feed deck **319** and the feed processing starts. On condition that the actual print materials have passed through point A in FIG. **3**, the control unit **205** starts feeding the checking print material regardless of whether the actual print materials have been discharged to delivery destination (output destination) Z.

[0420] In this fashion, the control unit **205** allows the printing system **1000** to start the checking print operation as quickly as possible after interrupting the actual print operation. Hence, the control unit **205** allows the printing system **1000** to perform the checking print operation without unnecessarily delaying the start of the checking print operation (by quickly starting the checking print operation).

[0421] In the embodiment, the printing system **1000** is configured to be able to perform the same operation as that of the above-mentioned configuration even when the actual print operation resumes after performing the checking print.

[0422] For example, referring back to FIG. **3**, after confirming that a checking print material has passed through point A in FIG. **3**, the control unit **205** controls the printing apparatus **100** so that the operator takes out the actual print materials of the job from the paper feed deck **319** and the feed processing starts. On condition that the checking print material of the job having undergone the checking print has passed through point A in FIG. **3**, the control unit **205** starts feeding print materials necessary for the actual print operation of the job regardless of whether the checking print material has been discharged to the delivery destination (output destination).

[0423] As described above, the control unit **205** causes the printing system **1000** to start the checking print operation from time TX shown in FIG. **8** on the basis of a checking print start request or automatic checking print execution instruction input when the operator designates the key **2304**B. The control unit **205** causes the printing system **1000** to automatically resume the actual print operation of the job having undergone the checking print upon completion of the checking print, i.e., from time TY shown in FIG. **8**. This resume processing corresponds to [step **3**] shown in FIG. **8**.

[0424] In the resume processing for the actual print operation of the job, the control unit **205** controls the printing system **1000** to print only unprocessed print data during the period immediately before [step **2**] shown in FIG. **8**.

[0425] In the resume processing, the control unit **205** utilizes, as information necessary for even the resume processing, information which represents the process status (progress) of a target job and is used by the control unit **205** as information necessary for the display processing of the window **2300**A. The control unit **205** controls to hold this information in the HDD **209** at least until the printing system **1000** completes all the actual print operation of the target job.

[0426] When the actual print operation resumes, the control unit **205** causes the touch panel section **401** to automatically display the window **2300**A again for the job. For example, the control unit **205** allows the touch panel section **401** to display the window **2300**A for the job during the resume operation for the actual print operation in [step **3**] shown in FIG. **8**. Assume that the current timing falls within the period from time immediately after the actual print operation of a given job starts to time immediately before the actual print operation of the job ends. In this case, the control unit **205** controls the printing system **1000** to repetitively perform the checking print operation of one job every time the operator inputs a checking print request via the key **2301**A displayed again in the touch panel section **401**, or the checking print is performed automatically.

[0427] During the execution period of the actual print operation which has resumed from time TY shown in FIG. **8** in the printing system **1000**, the control unit **205** selectively accepts the above-mentioned operator requests (**1**) to (**4**) from the operator via the operation unit **204**. The control unit **205** allows the printing system **1000** to perform processing corresponding to the accepted request.

[0428] In the embodiment, the control unit **205** controls the printing system **1000** to allow the operator to change the above-described settings specific to the printing system **1000** while continuing the actual print operation of the job that has resumed from time TY shown in FIG. **8**. For example, the control unit **205** accepts a request via the window **2400**C shown in FIG. **10**C to change the settings specific to the printing system **1000** while the actual print operation resumes in [step **3**] shown in FIG. **8**. In this case, the control unit **205** controls the printing system **1000** to automatically change the print operation processing conditions of the job upon accepting the request. Also when performing the print operations of subsequent jobs to be processed after the current job, the control unit **205** controls the printing system **1000** to keep processing the subsequent jobs under the setting-changed print processing conditions accepted from the operator via the window **2400**C.

[0429] Assume that the density of printing results gradually decreases as a result of performing the checking print for the same job repetitively at regular intervals. Even in this case, if

the operator changes settings via the window **2400**C to increase the density, the printing results of the job during printing and those of subsequent jobs can be output at proper print density.

[0430] Flowcharts shown in FIGS. **16**A, **16**B, and **16**C represent the process of the checking print operation performed by the control unit **205**.

[0431] In step S**101**, the control unit **205** causes the touch panel section **401** of the operation unit **204** to display the default window of the printing system **1000** as shown in FIG. **5** after the printing apparatus **100** is turned on. Then, the control unit **205** advances to step S**102**.

[0432] In step S**102**, the control unit **205** causes the touch panel section **401** of the operation unit **204** to display the key **1401** as shown in FIG. **11**A. The operator can designate the key **1401** to make the initial setting of the automatic checking print. If the operator designates the key **1401** to make the initial setting of the automatic checking print, the control unit **205** advances to step S**103**. If the operator does not make any initial setting, the control unit **205** advances to step S**104**.

[0433] In step S**103**, the control unit **205** causes the touch panel section **401** of the operation unit **204** to display a window (automatic checking print initial setting window) as shown in FIG. **11**B. The operator can make the initial setting of the automatic checking print in the initial setting window. The operator can input the number of sheets of a print job, at which the automatic checking print function can be selected, in the area **1501** in the automatic checking print initial setting window. An initial setting input (set) in this window is applied to all print jobs after this setting. Then, the control unit **205** advances to step S**104**.

[0434] In step S**104**, the control unit **205** accepts the settings of various printing conditions in response to a key operation by the operator via the operation unit **204**. Then, the control unit **205** advances to step

[0435] In step S**105**, the control unit **205** obtains the number of print sheets of the print job from the number of print pages of the print job, and the number of copies serving as one of the printing conditions set in step S**104**. The control unit **205** determines whether the obtained number of print sheets meets the condition of the number of sheets of the print job set in step S**103** at which the automatic checking print can be selected. If the obtained number of print sheets is equal to or larger than the number of sheets of the print job at which the automatic checking print can be selected, the control unit **205** determines that the automatic checking print can be performed for the print job. Then, the control unit **205** advances to step S**106**. If the obtained number of print sheets is smaller than the number of sheets of the print job at which the automatic checking print can be selected, the control unit **205** determines that no automatic checking print can be performed for the print job. Then, the control unit **205** advances to step S**108**.

[0436] In step S**106**, the control unit **205** causes the touch panel section **401** of the operation unit **204** to display the window (automatic checking print execution condition setting window) shown in FIG. **12**. If the operator designates the key **1601** in the automatic checking print execution condition setting window, the control unit **205** sets execution of the automatic checking print. If the operator designates the OK key **1605** in this state, the control unit **205** sets execution of the checking print, and advances to step S**108**.

[0437] If the operator designates the OK key **1605** while designating an OFF key **1602** in the automatic checking print execution condition setting window, the control unit **205** advances to step S**108** without setting execution of the checking print. If the operator designates the advanced setting key **1603**, the control unit **205** advances to step S**107**.

[0438] In step S**107**, the control unit **205** causes the touch panel section **401** of the operation unit **204** to display the window (automatic checking print execution condition advanced setting window) shown in FIG. **13**A. The operator can set a print execution sheet count and print execution time in the automatic checking print execution condition advanced setting window.

[0439] In step S**107**, the control unit **205** causes the touch panel section **401** of the operation unit **204** to display the window shown in FIG. **13**B. If the operator designates the key **1705**, the control unit **205** controls to perform the first type checking print operation. If the operator designates the key **1706**, the control unit **205** controls to perform the second type checking print operation.

[0440] The control unit **205** writes the execution condition input by the operator over a predetermined execution condition setting held in advance, and holds the input execution condition. More specifically, in step S**106**, the operator designates the key **1601** to set execution of the checking print. However, if the operator does not designate the advanced setting key **1603** so as not to make any advanced setting in step S**107**, only execution of the automatic checking print is set. A detailed execution condition complies with a predetermined setting held in advance in the control unit **205**.

[0441] The print execution sheet count of a print job is a condition to perform the checking print automatically every time the number of printed sheets reaches the number of sheets set as the print execution sheet count when the automatic checking print execution condition is determined.

[0442] If the operator sets the automatic checking print execution condition in step S**107**, the control unit **205** sets execution of the checking print in step S**119** every set print execution sheet count of a print job. For example, the total number of print sheets of a job requiring printing of 10 copies each of 10 sheets is 100. If the operator sets "30 sheets" as the print execution sheet count via the key **1701**, the control unit performs the checking print every time the cumulative number of print sheets reaches 30, 60, and 90.

[0443] Similarly, the print execution time of a print job is a condition to perform the checking print automatically every time the cumulative print execution time of a print job reaches the time set as the print execution time when the automatic checking print execution condition is determined.

[0444] In step S**107**, the control unit **205** sets execution of the checking print in step S**120** every set print execution time of a print job. For example, when the operator sets "every 10 min" as the print execution time, the checking print is performed every 10 min till the completion of printing after the start of printing the print job.

[0445] The operator may also set either or both of the print execution sheet count and print execution time. When the operator sets both of the print execution sheet count and print execution time, the control unit **205** sets the checking print if the condition is satisfied in either of the processes in steps S**119** and S**120**.

[0446] If the operator designates the key **1704** shown in FIG. **13**A in step S**107**, the control unit **205** displays the window shown in FIG. **13**B. In this window, the operator sets the type of checking print material when performing the checking print automatically on the basis of the automatic

checking print execution condition set in the window shown in FIG. **13**A. If the operator designates the "all pages" key **1705**, the control unit **205** holds the setting to print all the pages of one copy in the print job as the checking print target. If the operator designates the "one page (auto)" key **1706**, the control unit **205** holds the setting to print one page satisfying the above-described condition as the checking print target.

[0447] If the control unit **205** detects that the operator has designated the OK key **1708** in the window shown in FIG. **13**B, it holds the type of checking print. Then, the control unit **205** advances to step S**108**.

[0448] In step S**108**, the control unit **205** determines, based on whether the operator has pressed the start key **503**, whether it has accepted a print start request for the target job.

[0449] Assume that the operator inputs a series of print processing conditions via the operation unit **204** for the target job and then presses the start key **503**. In this case, the control unit **205** detects the print start request (input from the start key **503**), and determines YES in step S**108**. Then, the control unit **205** advances the process from step S**108** to step S**109**.

[0450] In step S**109**, the control unit **205** controls the touch panel section **401** to popup-display the window (job process status window & print status window) **2300**A shown in FIG. **9**D and the like as a display representing the processing conditions (progress) of the print start-requested job.

[0451] The control unit **205** controls the printing apparatus **100** to perform a process in step S**110** at the same time as (in parallel with) performing the process in step S**109**.

[0452] Assume that the job requires a document scan operation by the scanner unit **201**. In this case, in step S**110**, the control unit **205** causes the scanner unit **201** to start the scan operation of the job. The control unit **205** stores the print data of the scanned job sequentially from the first page in the HDD **209**. This storage operation continues until the print data of the final page of the job is stored in the HDD **209**. The control unit **205** controls the printing system **1000** to execute, in step S**110**, the operation of storing print data of the print start-requested job in the HDD **209**.

[0453] In step Sill, the control unit **205** causes the printer unit **203** to read out, from the HDD **209**, the print data of the job for which the print start request has been accepted in step S**108**, and print based on the readout print data. In step Sill, the control unit **205** controls the printing system **1000** to perform a print operation complying with the series of print processing conditions of the job that has been accepted from the operator in step S**104**. Then, the control unit **205** advances to step S**112**.

[0454] The "print operation" performed in step Sill is the "actual print operation".

[0455] The control unit **205** controls to keep holding the print data of all the pages of the job in the HDD **209** until the printing system **1000** completes all the actual print operation. The control unit **205** controls the HDD **209** to allow using the print data of the job held in the HDD **209**, as needed.

[0456] Further, the control unit **205** controls the touch panel section **401** to maintain the popup display of the window **2300**A for the job in step S**109** while performing the process in step S**111**.

[0457] As described with reference to FIG. **9**D, the control unit **205** controls the touch panel section **401** so that the display contents of the window **2300**A reflect in real time the actual process status (progress) of the target job in the printing system **1000**.

[0458] The control unit **205** sets, in the printer unit **203**, a print density set in the window **2300**A displayed in step S**109**, and reflects the set print density in the print job in execution without stopping the print processing. Similarly when the print density is changed, the control unit **205** sets the changed print density in the printer unit **203**, and quickly reflects it in the print job in execution.

[0459] This control continues until the actual print job is completed in step S**113** after the window **2300**A is displayed in step S**109**.

[0460] In step S**112**, the control unit **205** determines whether the operator has designated a stop key **2301**C in the popup display of the window **2300**A for the job shown in FIG. **9**D in order to stop the print job in execution. Immediately when the operator designates the stop key **2301**C, the control unit **205** controls to stop processing for the job by the printer unit **203**. After the printing by the printer unit **203** stops, the control unit **205** advances to step S**104** to allow making print settings for the print job.

[0461] The operator checks the print quality of a checking print material obtained by the checking print executed during printing (actual printing) of the print job, instead of the actual printing. Immediately after the end of printing by the checking print function, the actual printing resumes automatically. Thus, even while the operator checks the result of the checking print material, the actual printing is being executed. If the operator who has checked the printing result of the checking print material determines that the density is not proper, he operates the key **2301**D in the window **2300**A shown in FIG. **9**D. Then, the operator can change the density of actual print materials during printing. If a quality other than the density is not proper, or no density can be adjusted by the above-mentioned density adjustment, the operator can designate the stop key **2301**C to stop the print job in execution. After the print setting is changed, printing of the stopped print job is performed again.

[0462] In step S**113**, based on information from units (e.g., the printer unit **203** and sheet processing apparatus **200**) necessary to process the job, the control unit **205** determines whether the printing system **1000** completes the actual print operation of the job that has started in step S**111**.

[0463] If the control unit **205** determines in step S**113** that all the actual print operation of the job is complete, it advances the process from step S**113** to step S**114**.

[0464] In step S**114**, the control unit **205** controls the touch panel section **401** to end the popup display of the window **2300**A (cancel the popup window) for the job which has already started from the stage of step S**109**.

[0465] The control unit **205** controls the touch panel section **401** to automatically end the display of the window **2300**A upon completion of the actual print operation. Also when the operator designates a "close" key in the window **2300**A, the control unit **205** controls the touch panel section **401** to end the display of the window **2300**A. After the end of the process in step S**114**, the control unit **205** returns to the process in step S**101**.

[0466] If the control unit **205** determines that all the actual print operation of the target job is not complete in the printing system **1000**, it advances the process from step S**113** to step S**115**.

[0467] In step S**115**, the control unit **205** determines whether the operator has input a checking print request to

output the checking print material of the job while the printer unit **203** continues the actual print operation of the job in execution.

[0468] The determination in step S**115** is based on whether the operator has designated the "checking print" key **2301**A in the window **2300**A that has been displayed in the touch panel section **401** for the job from the stage of step S**109**.

[0469] If the operator has not designated the key **2301**A and the control unit **205** determines that he has not input any checking print request, the control unit **205** advances from step S**115** to step S**118**.

[0470] If the operator has designated the key **2301**A and the control unit **205** determines that he has input a checking print request, the control unit **205** shifts the process from step S**115** to step S**116**.

[0471] In step S**116**, the control unit **205** causes the touch panel section **401** to display the window **2300**B representing the type of checking print, as shown in FIG. **9**E.

[0472] The control unit **205** causes the touch panel section **401** to display the window **2300**B shown in FIG. **9**E while the printer unit **203** continues the actual print operation of the job in execution. Then, the control unit **205** advances to step S**117**.

[0473] In step S**117**, the control unit **205** determines whether the operator has input a checking print start instruction for the job while continuing the actual print operation of the job.

[0474] The determination in step S**117** is made by determining whether the operator has designated the key **2304**B in the window **2300**B shown in FIG. **9**E.

[0475] Assume that the control unit **205** determines in step S**117** that the operator has neither designated the key **2304**B nor input a checking print start instruction. In this case, the control unit **205** waits until the operator selects the type of checking print in the window **2300**B, without advancing the process from step S**117**. In this state, the control unit **205** controls the printing system **1000** so that the printer unit **203** continues the actual print operation of the job in execution.

[0476] Assume that the operator selects either the first or second type checking print operation with either the key **2301**B or **2302**B in the window **2300**B, and designates the key **2304**B. In response to the checking print start instruction input from the operator via the key **2304**B, the control unit **205** advances the process from step S**117** to step S**121**.

[0477] In step S**118**, the control unit **205** determines whether the automatic checking print execution condition has been set for the print job in execution. If the control unit **205** determines in step S**118** that the automatic checking print execution condition has been set in step S**106**, it advances to step S**119** in order to confirm whether the state of the print job in execution meets the execution condition. If the control unit **205** determines, in step S**118** based on the setting in step S**106**, that no automatic checking print execution condition has been set, it returns the process from step S**118** to step S**112**.

[0478] In step S**119**, the control unit **205** determines whether the cumulative number of print sheets of the print job in execution meets the automatic checking print execution condition set in step S**106**. The control unit **205** compares the cumulative number of sheets after the start of printing of the print job in execution with the automatic checking print execution condition set in step S**106** or S**107**.

[0479] Assume that the operator sets printing of 10 copies of a 10-page original document as a print setting condition in step S**104**. In this case, assume that the operator sets in step S**107** to perform the checking print every 20 copies.

[0480] If the cumulative number of print sheets of the print job in execution meets this condition, the control unit **205** advances from step S**119** to step S**121** to stop the print job in execution and start the checking print. If the cumulative number of print sheets of the print job in execution satisfies does not meet this condition, the control unit **205** advances to step S**120** in order to determine the automatic checking print execution condition based on the print execution time.

[0481] In step S**120**, the control unit **205** determines whether the cumulative print time of the print job in execution meets the automatic checking print execution condition set in step S**106**. The control unit **205** compares the execution time till this determination after the start of printing of the print job in execution with the automatic checking print execution condition set in step S**106** or S**107**. If the cumulative print time of the print job in execution meets the automatic checking print execution condition as a result of the comparison, the control unit **205** advances to step S**121**. If the cumulative print time of the print job in execution does not meet the automatic checking print execution condition, the control unit **205** returns the process to step S**112** without performing the checking print.

[0482] In step S**121**, the control unit **205** interrupts the actual print operation of the checking print-requested job. This actual print operation is the print operation which has already started from the stage of step S**111** in the printing system **1000**. The control unit **205** controls the printing system **1000** to interrupt the actual print operation.

[0483] In step S**122**, the control unit **205** controls the printing system **1000** to automatically start the checking print operation of outputting the checking print material of the job immediately after interrupting (suspending) the actual print operation.

[0484] The control unit **205** controls the printing system **1000** to print the same print data as print data subjected to the actual print operation of the job on a print medium (also called print paper or a sheet) necessary for the checking print operation performed in step S**122**.

[0485] For this purpose, the control unit **205** controls the printing apparatus **100** to utilize, even in step S**122**, print data which has already been held in the HDD **209** by the process of step S**110** and is necessary for the actual print operation of the job, as described above.

[0486] In the checking print operation performed in step S**122**, print data of all pages necessary for the actual print operation can be printed. This case corresponds to a case where the control unit **205** controls the printing system **1000** to perform the first type checking print operation in response to selection of the key **2301**B.

[0487] In the checking print operation performed in step S**122**, print data of one page out of print data necessary for the actual print operation can also be printed. This case corresponds to a case where the control unit **205** controls the printing system **1000** to perform the second type checking print operation in response to selection of the key **2302**B.

[0488] In this way, in step S**122**, the control unit **205** causes the printing system **1000** to perform an operation designated by the operator out of the first and second type checking print operations described above.

[0489] After step S**122**, the control unit **205** executes the process in step S**123**.

[0490] In step S**123**, the control unit **205** determines, based on information from various sensors arranged on the sheet feeding path in the printing system **1000**, whether the checking print operation of the job that has started in step S**122** is complete.

[0491] If the control unit **205** determines in step S**123** that the checking print operation is not complete, it waits for the completion of the checking print operation without shifting to the next step.

[0492] If the control unit **205** determines in step S**123** that the checking print operation is complete, it advances the process from step S**123** to step S**124**.

[0493] In step S**124**, the control unit **205** executes a predetermined notification means. By this operation, the control unit **205** notifies the operator at a distance from the printing apparatus **100** that the checking print has been performed. Upon receiving the notification, the operator checks the quality of output materials.

[0494] The notification means executed by the control unit **205** to the operator in step S**124** includes the following examples. That is, there are a notification on the UI (User Interface) of an application installed in the PC **104**, and a notification on the UI of a Web application activated on a Web browser which runs in a PC on the network **101**. There is also a notification by sending e-mail to the operator. There are further notifications by notification means such as the printing apparatus **100**, a lamp or buzzer attached to the printing apparatus **100**, a display on the UI, and a display on the UI of a terminal carried by the operator. A combination of these notification means can more reliably notify the operator that the checking print has been performed.

[0495] After notifying the operator by the notification means in step S**124** that the checking print has been performed, the control unit **205** advances to step S**125**.

[0496] In step S**125**, the control unit **205** controls the printing system **1000** to perform (continue) the actual print operation of the job having undergone the checking print operation again from this timing.

[0497] In the actual print operation of the job that resumes in step S**125**, the control unit **205** controls the printing system **1000** not to print the print data of the job that have been processed immediately before interrupting the print operation of the job in step S**121**.

[0498] In step S**125**, the control unit **205** controls the printing system **1000** to print only the remaining print data of the job that have not been processed in the stage of step S**121**.

[0499] When performing again the actual print operation in step S**125**, the control unit **205** controls the printing apparatus **100** to utilize, even in step S**125**, print data which have already been held in the HDD **209** in step S**110** or the like and are necessary for the actual print operation of the job, as described above.

[0500] After the process in step S**125**, the control unit **205** controls to return the process from step S**125** to step S**112**.

[0501] If the process returns from step S**125** to step S**112**, the control unit **205** controls the touch panel section **401** to display the window **2300**A again on condition that the actual print operation is not complete, as described with reference to FIG. **9**F.

[0502] The control unit **205** controls the printing system **1000** to shift the process again from step S**113** to step S**115** and perform the processes in steps S**115** to S**125** again.

[0503] [Other Mechanisms]

[0504] A host computer (e.g., the PC **103** or **104**) may also execute an externally installed program to achieve the functions shown in the drawings. In this case, data for displaying the same windows as those described in the embodiment including respective windows are externally installed to provide various user interface windows on the display of the host computer.

[0505] For this purpose, a computer-readable storage medium which stores software program codes for implementing the functions of the above-described embodiment is supplied to a system or apparatus. The computer (CPU or MPU) of the system or apparatus reads out and executes the program codes stored in the storage medium, achieving the object of the present invention. In this case, the program codes read out from the storage medium implement new functions of the present invention, and the storage medium which stores the program codes constitutes the present invention. The program form is arbitrary such as an object code, a program executed by an interpreter, or script data supplied to an OS as long as a program function is attained.

[0506] The storage medium for supplying the program includes a flexible disk, hard disk, optical disk, magnetooptical disk, MO, CD-ROM, CD-R, CD-RW, magnetic tape, nonvolatile memory card, ROM, and DVD. In this case, the program codes read out from the storage medium implement the functions of the above-described embodiment, and the storage medium which stores the program codes constitutes the present invention.

[0507] As another program supply method, a client computer connects to an Internet homepage via the browser of the client computer. Then, the computer program of the present invention or a compressed file containing an automatic installing function is downloaded from the homepage to a recording medium such as a hard disk, thereby supplying the program. The program can also be supplied by grouping program codes which form the program of the present invention into a plurality of files, and downloading the files from different homepages. That is, the present invention also incorporates a WWW server, FTP server, and the like which prompt a plurality of users to download the program files for implementing functional processes of the present invention by a computer.

[0508] The program of the present invention can be encrypted, stored in a storage medium such as a CD-ROM, and distributed to a user. A user who satisfies predetermined conditions is prompted to download decryption key information from a homepage via the Internet. The user executes the encrypted program using the key information, and installs the program in the computer.

[0509] The functions of the above-described embodiment are implemented when the computer executes the readout program codes. Also, the functions of the above-described embodiment are implemented when an OS (Operating System) or the like running on the computer performs some or all of actual processes on the basis of the instructions of the program codes.

[0510] Further, the functions of the above-described embodiment are implemented in the following case. That is, the program codes read out from the storage medium are written in the memory of a function expansion board inserted into the computer or the memory of a function expansion unit connected to the computer. The CPU of the function expan-

sion board or function expansion unit performs some or all of actual processes on the basis of the instructions of the program codes.

[0511] The present invention may also be applied to a system including a plurality of devices or an apparatus formed by a single device. The present invention can also be achieved by supplying a program to the system or apparatus. In this case, the system or apparatus can obtain the effects of the present invention by providing, to the system or apparatus, a storage medium which stores a software program for achieving the present invention.

[0512] The present invention is not limited to the above-described embodiment, and various modifications (including organic combinations of embodiments) can be made without departing from the gist of the invention, and are not excluded from the scope of the invention.

[0513] For example, in the embodiment, jobs controlled by the checking print function may also include a "print job for printing" issued from a PC application. In this case, the job also contains a form of instructing the checking print for the print job saved in the hard disk.

[0514] The embodiment has exemplified a configuration in which the control unit **205** of the printing apparatus **100** performs the above-described control operations. However, another control unit different from the control unit **205** may also execute some or all of the control operations described above. Examples of another control unit different from the control unit **205** are the external controller of a housing different from the printing apparatus **100**, the CPU of a remote external apparatus such as the PC **104**, and the CPU of an inline finisher. This configuration can further improve the effect capable of building a flexible printing environment complying with a printing environment where the printing system **1000** may be installed.

[0515] The embodiment can provide a convenient printing system with an eye toward a future digital printing system. For example, the embodiment can establish a convenient, flexible printing environment capable of coping with use cases and needs assumed in a POD environment described in Description of the Related Art. The embodiment can provide various mechanisms toward practical application of the printing system.

[0516] Various examples and embodiments of the present invention have been described. It is apparent to those skilled in the art that the spirit and scope of the invention are not limited to a specific description in this specification.

[0517] While the present invention has been described with reference to exemplary embodiments, it is to be understood that the invention is not limited to the disclosed exemplary embodiments. The scope of the following claims is to be accorded the broadest interpretation so as to encompass all such modifications and equivalent structures and functions. This application claims the benefit of Japanese Patent Application No. 2007-229457 filed Sep. 4, 2007, which is hereby incorporated by reference herein in its entirety.

What is claimed is:

1. A printing system comprising:

a receiver adapted to receive a predetermined user's instruction via a user interface, the predetermined user's instruction being adapted to request a checking print, the checking print being adapted to perform at least one of checking of a printing result and changing of a printing condition; and

a controller adapted to cause a printer to perform the checking print for a job in a case that the predetermined user's instruction is received via the user interface,

wherein the controller is adapted to cause the printer to perform the checking print for the job without receiving the predetermined user's instruction via the user interface in a case that the job meets a predetermined condition, the predetermined condition being adapted to cause the printer to perform the checking print automatically.

2. The system according to claim **1**, wherein the controller is adapted to cause the printer to perform the checking print automatically using print data of the job.

3. The system according to claim **1**, wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job.

4. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print upon receiving the predetermined user's instruction during printing of the job without performing the checking print automatically in a case that the job does not require not less than a predetermined number of print media to complete printing, and

wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job without receiving the predetermined user's instruction in a case that the job requires not less than the predetermined number of print media to complete printing.

5. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print upon receiving the predetermined user's instruction during printing of the job without performing the checking print automatically in a case that the job does not require not less than a predetermined time to complete printing, and

wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job without receiving the predetermined user's instruction in a case that the job requires not less than the predetermined time to complete printing.

6. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print upon receiving the predetermined user's instruction during printing of the job without performing the checking print automatically in a case that the job does not require output of a print material to a predetermined delivery portion,

wherein the predetermined delivery portion is arranged in a post processor, and

wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job without receiving the predetermined user's instruction in a case that the job requires output of a print material to the predetermined delivery portion.

7. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print upon receiving the predetermined user's instruction during printing of the job without performing the checking print automatically in a case that the job does not require execution of predetermined type of post processing,

wherein the predetermined type of post processing includes a plurality of post steps, and

wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job without receiving the predetermined user's instruction in a case that the job requires execution of the predetermined type of post processing.

8. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print upon receiving the predetermined user's instruction during printing of the job without performing the checking print automatically in a case that the job does not require a predetermined type of consumable,

wherein the predetermined type of post processing includes a plurality of post steps, and

wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job without receiving the predetermined user's instruction in a case that the job requires the predetermined type of consumable.

9. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print upon receiving the predetermined user's instruction during printing of the job without performing the checking print automatically in a case that the job is adapted to print image data read by a reader,

wherein the controller is adapted to cause the printer to perform the checking print automatically during printing of the job without receiving the predetermined user's instruction in a case that the job is a predetermined type of job for printing image data transmitted from another apparatus different from a printing apparatus, and

wherein the printing apparatus comprises the printer.

10. The system according to claim **1**, wherein the controller is adapted to cause the printer to perform the checking print automatically for the job repetitively at a predetermined interval in a case that the checking print is performed automatically during printing of the job.

11. The system according to claim **10**,

wherein the controller is adapted to cause the printer to perform the checking print instead of printing of the job every time the job for printing a specific number of sheets smaller than a predetermined number of sheets is performed, and

wherein the predetermined number of sheets is adapted as the predetermined condition.

12. The system according to claim **10**,

wherein the controller is adapted to cause the printer to perform the checking print instead of printing of the job every time the job for printing for a specific time shorter than a predetermined time is performed, and

wherein the predetermined time is adapted as the predetermined condition.

13. The system according to claim **1**,

wherein the controller is adapted to cause the printer to perform the checking print automatically in accordance with a first instruction in a case that the first instruction has been input in advance via the user interface,

wherein the first instruction is an instruction adapted to cause the printer to perform the checking print automatically after printing of the job is performed by the number of sheets designated by a user,

wherein the controller is adapted to cause the printer to perform the checking print automatically in accordance with a second instruction in a case that the second instruction has been input in advance via the user interface, and

wherein the second instruction is an instruction adapted to cause the printer to perform the checking print automatically after printing of the job is performed for a time designated by the user.

14. The system according to claim **1**, wherein the controller is adapted to inhibit performing the checking print automatically during printing of the job in a case that a user has input in advance a request via the user interface to inhibit performing the checking print automatically during printing of the job.

15. The system according to claim **1**, wherein the controller is adapted to cause the printer to perform the checking print during printing of the job upon receiving the predetermined user's instruction via the user interface while the printer performs printing of the job in a case that the job does not meet the predetermined condition.

16. The system according to claim **1**,

wherein the controller is adapted to control the printer to output another predetermined print material to another predetermined discharge portion different from a predetermined discharge portion adapted to discharge a predetermined print material in both a first case and a second case,

wherein the first case is adopted to perform the checking print automatically during printing of the job if the job meets the predetermined condition,

wherein the second case is adopted to perform the checking print during printing of the job upon receiving the predetermined user's instruction,

wherein the predetermined discharge portion is adapted to discharge a print material obtained by performing printing of the job, and

wherein the other predetermined discharge portion is adapted to discharge the other print material obtained by performing the checking print.

17. The system according to claim **16**,

wherein a discharge portion arranged inside a specific type of post processor is adapted as the predetermined discharge portion, and

wherein a discharge portion arranged outside the post processor is adapted as the other predetermined discharge portion.

18. The system according to claim **16**, wherein the controller is adopted to control the printer to resume printing of the job automatically after performing the checking print in at least one of the first case and the second case.

19. The system according to claim **18**,

wherein the controller is adopted to inhibit resuming printing of the job automatically after performing the checking print in a case that an instruction is input via the user interface prior to performing the checking print in the second case, and

wherein the instruction is adapted to inhibit resuming printing of the job automatically.

20. The system according to claim **1**, wherein the controller and the user interface are provided by a printing apparatus having the printer.

21. The system according to claim **1**, wherein the controller and the user interface are provided by another apparatus configured to be able to communication data with a printing apparatus having the printer.

22. A printing apparatus which can be adapted to the printing system defined in claim **1**, the apparatus comprising the printer, the receiver, and the controller.

23. A controlling method adapted to a printing system configured to cause a printer to perform a checking print, the checking print being adapted to perform at least one of checking of a printing result and changing of a printing condition, the method comprising:

causing the printer to perform the checking print for a job in a case that a predetermined user's instruction is received via a user interface, the predetermined user's instruction being adapted to request the checking print; and

causing the printer to perform the checking print for the job without receiving the predetermined user's instruction via the user interface in a case that the job meets a predetermined condition, the predetermined condition being adapted to cause the printer to perform the checking print automatically.

24. A computer-readable storage medium storing a program which causes a computer to perform the controlling method defined in claim **23**.

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