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(54) **PRINT CONTROL APPARATUS, PRINT CONTROL SYSTEM, AND STORAGE MEDIUM**

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(57) **ABSTRACT**

A print control apparatus includes a hardware processor. The hardware processor receives a plurality of small jobs transmitted from a client terminal based on a print instruction, performs control to perform printing based on the received small jobs, accepts a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction, and when the job cancel instruction is accepted during reception of the plurality of small jobs, performs control such that the printing based on the small jobs is terminated or interrupted.

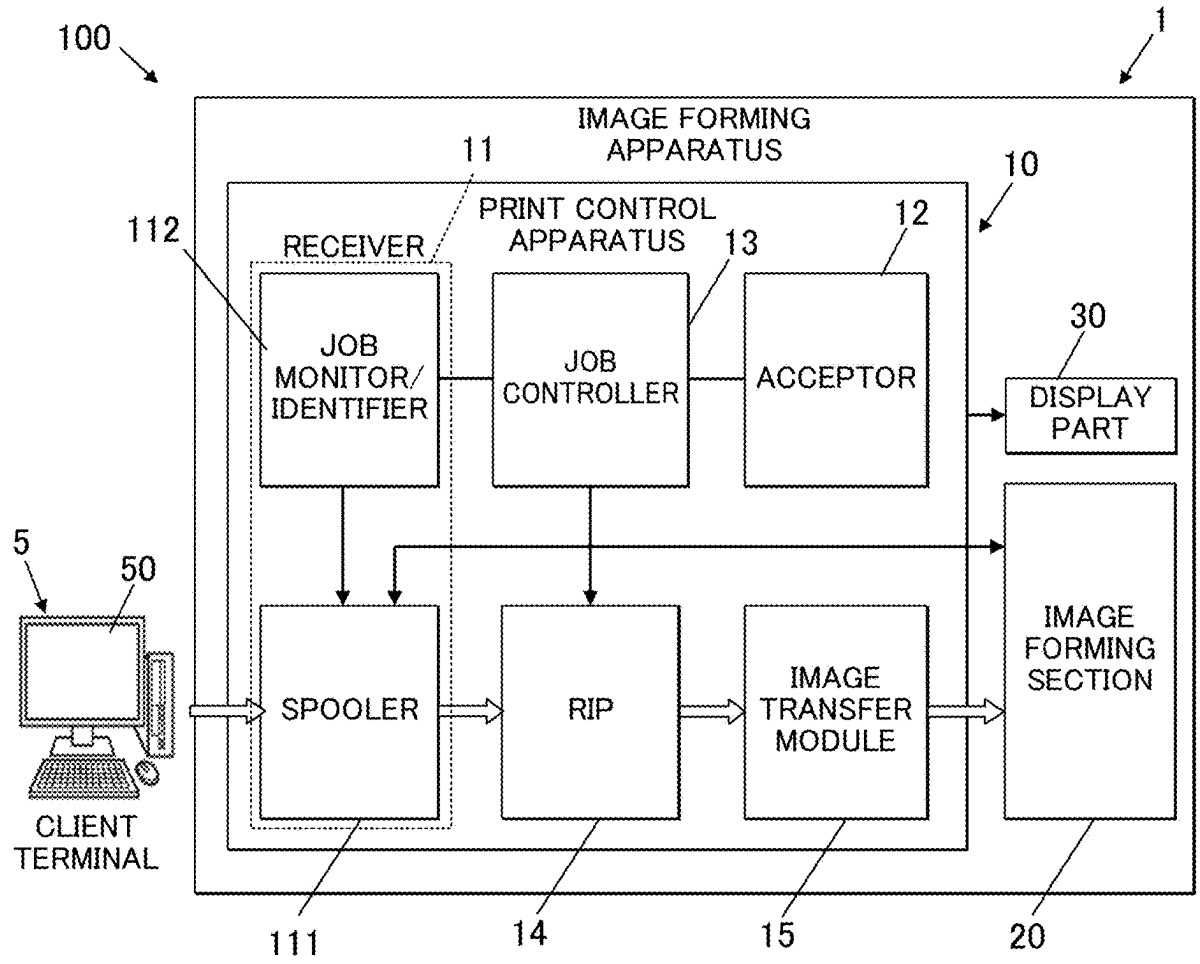


FIG.1

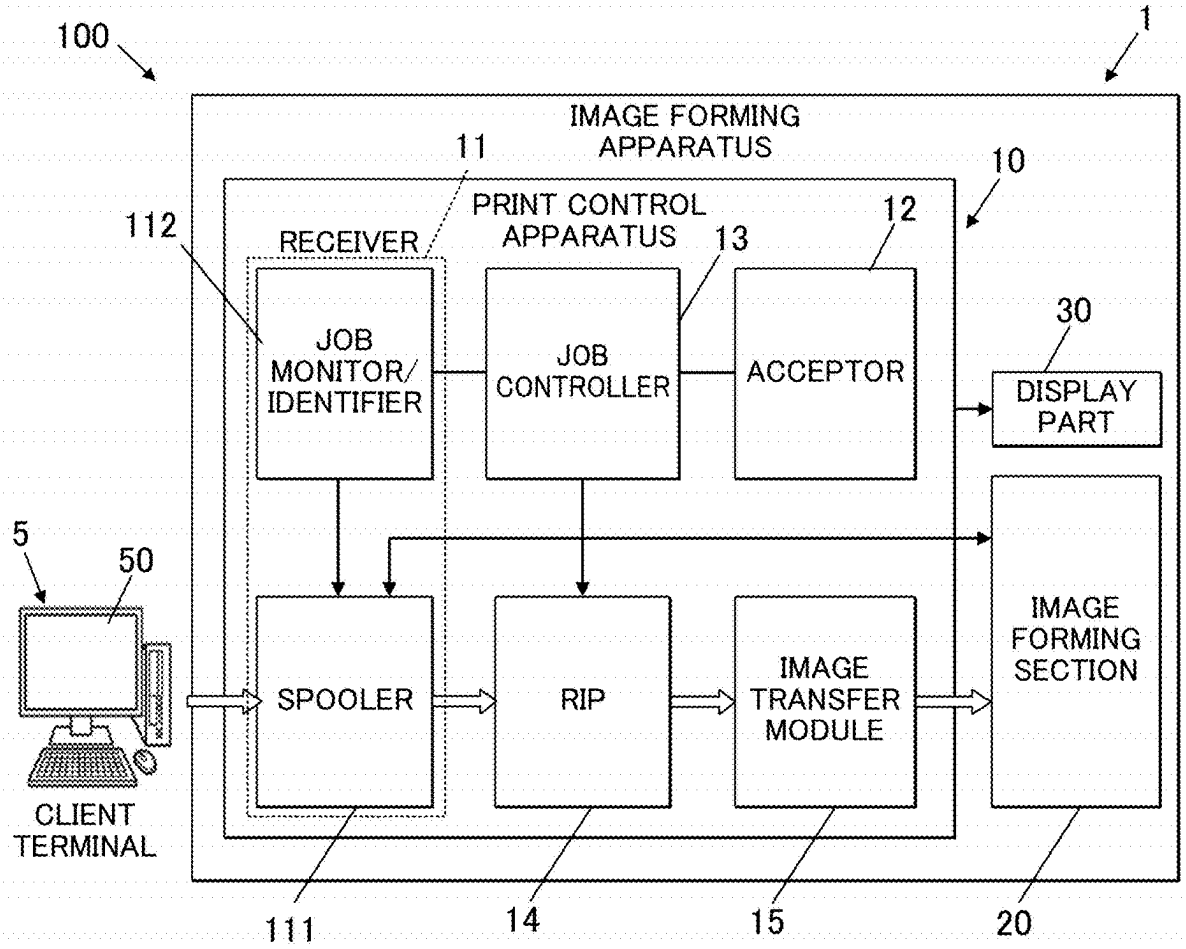

100
1
IMAGE FORMING APPARATUS
11
10
PRINT CONTROL APPARATUS
112
RECEIVER
13
12
30
JOB MONITOR/ IDENTIFIER
JOB CONTROLLER
ACCEPTOR
DISPLAY PART
5
50
SPOOLER
RIP
IMAGE TRANSFER MODULE
IMAGE FORMING SECTION
CLIENT TERMINAL
111
14
15
20

FIG.2

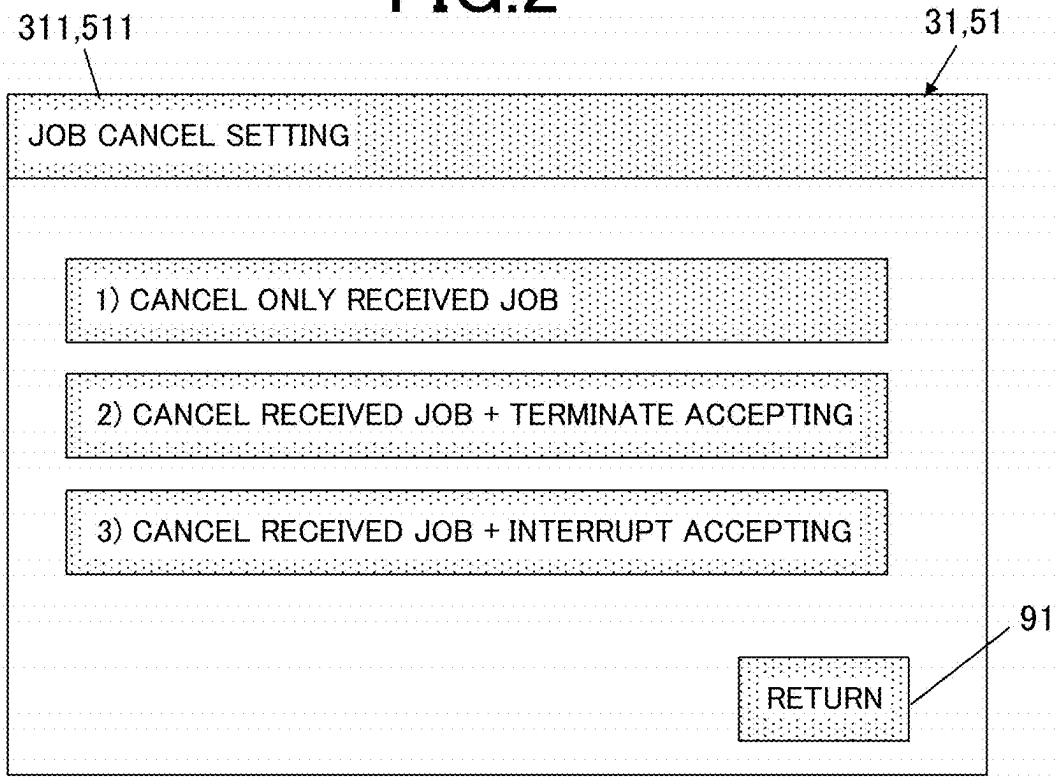

311,511
31,51
JOB CANCEL SETTING
1) CANCEL ONLY RECEIVED JOB
2) CANCEL RECEIVED JOB + TERMINATE ACCEPTING
3) CANCEL RECEIVED JOB + INTERRUPT ACCEPTING
91
RETURN

FIG.3

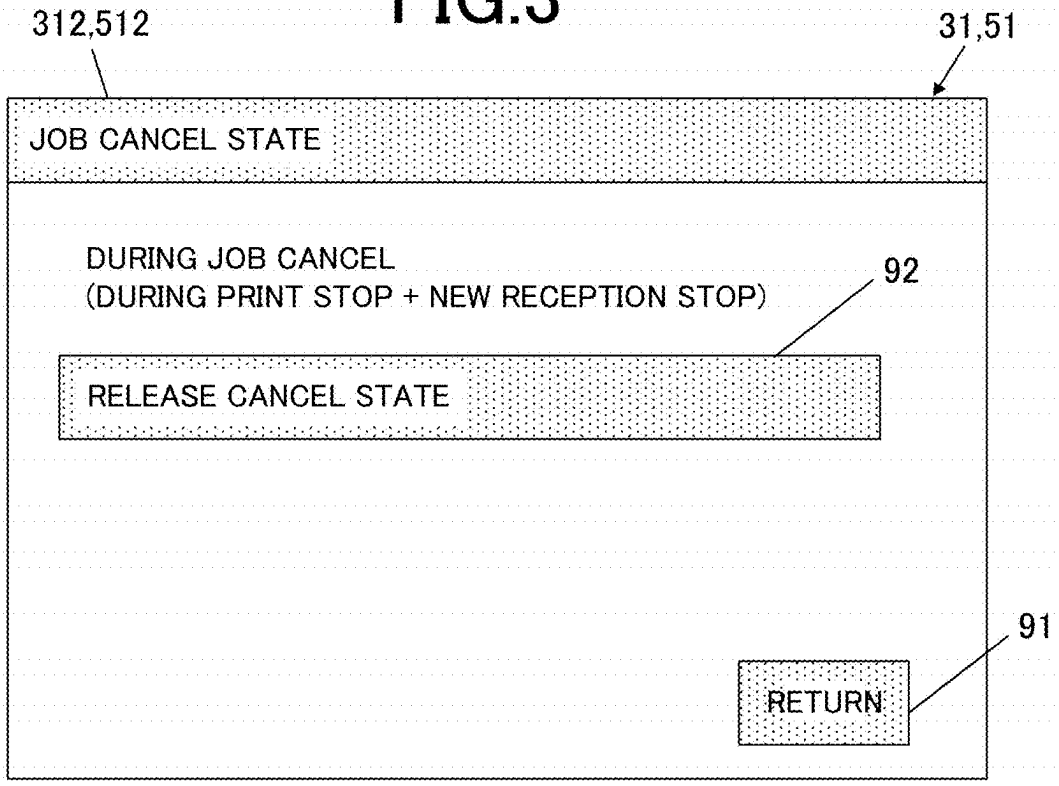

312,512
31,51
JOB CANCEL STATE
DURING JOB CANCEL
(DURING PRINT STOP + NEW RECEPTION STOP)
92
RELEASE CANCEL STATE
91
RETURN

FIG.4

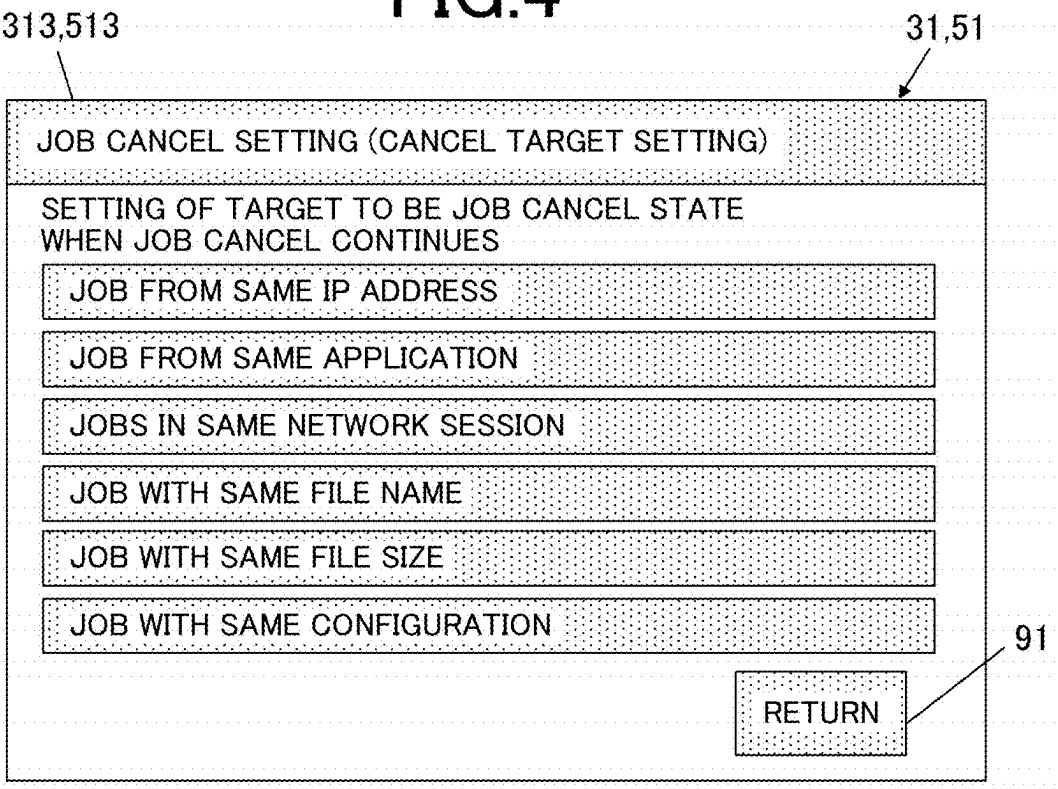

313,513
31,51
JOB CANCEL SETTING (CANCEL TARGET SETTING)
SETTING OF TARGET TO BE JOB CANCEL STATE WHEN JOB CANCEL CONTINUES
JOB FROM SAME IP ADDRESS
JOB FROM SAME APPLICATION
JOBS IN SAME NETWORK SESSION
JOB WITH SAME FILE NAME
JOB WITH SAME FILE SIZE
JOB WITH SAME CONFIGURATION
91
RETURN

FIG.5

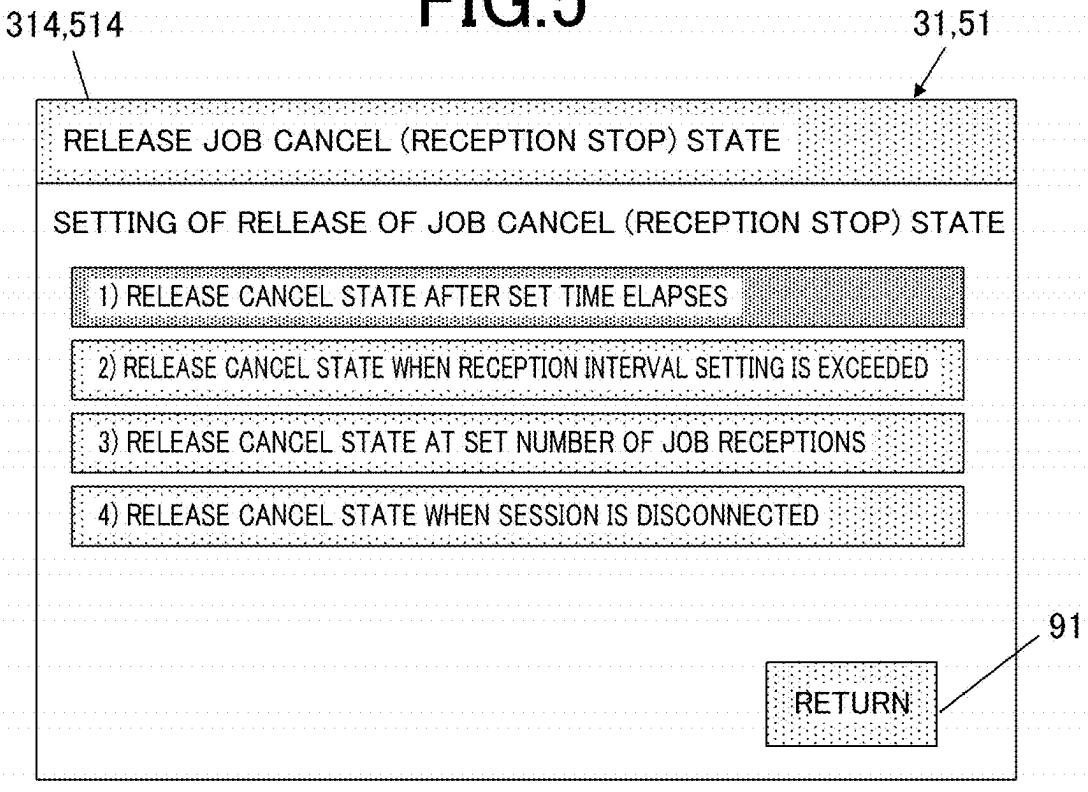

314,514
31,51
RELEASE JOB CANCEL (RECEPTION STOP) STATE
SETTING OF RELEASE OF JOB CANCEL (RECEPTION STOP) STATE
1) RELEASE CANCEL STATE AFTER SET TIME ELAPSES
2) RELEASE CANCEL STATE WHEN RECEPTION INTERVAL SETTING IS EXCEEDED
3) RELEASE CANCEL STATE AT SET NUMBER OF JOB RECEPTIONS
4) RELEASE CANCEL STATE WHEN SESSION IS DISCONNECTED
91
RETURN

FIG.6

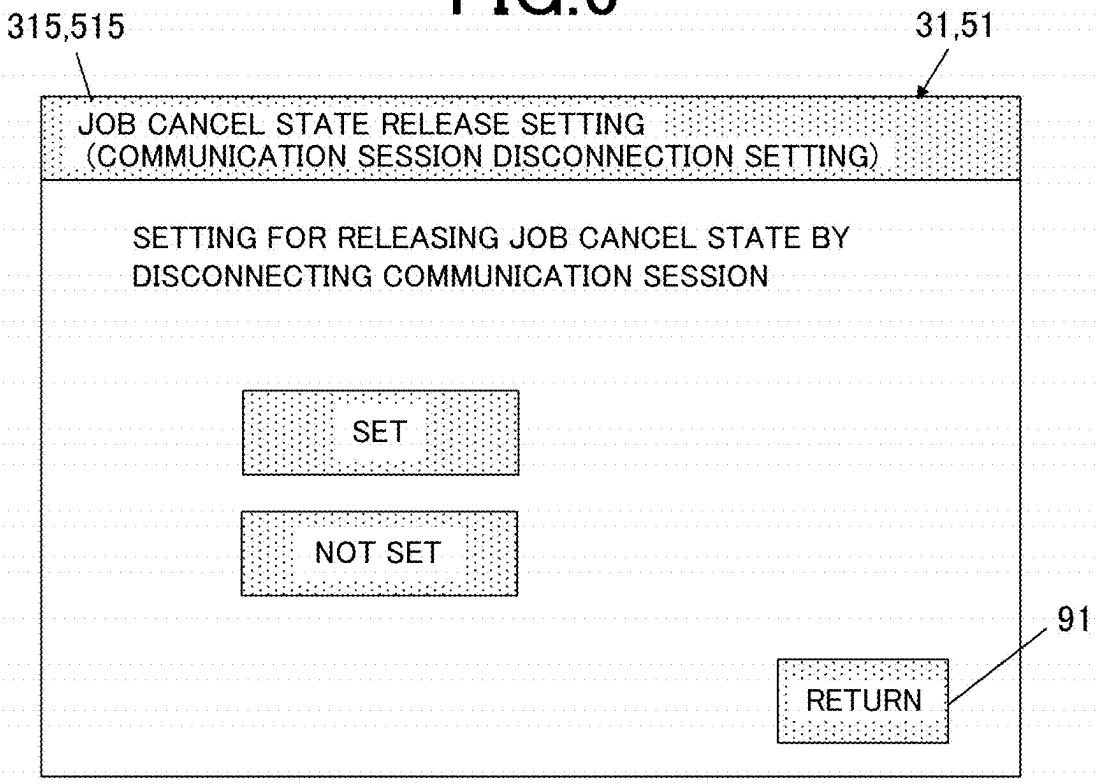

315,515
31,51
JOB CANCEL STATE RELEASE SETTING
(COMMUNICATION SESSION DISCONNECTION SETTING)
SETTING FOR RELEASING JOB CANCEL STATE BY
DISCONNECTING COMMUNICATION SESSION
SET
NOT SET
91
RETURN

FIG.7

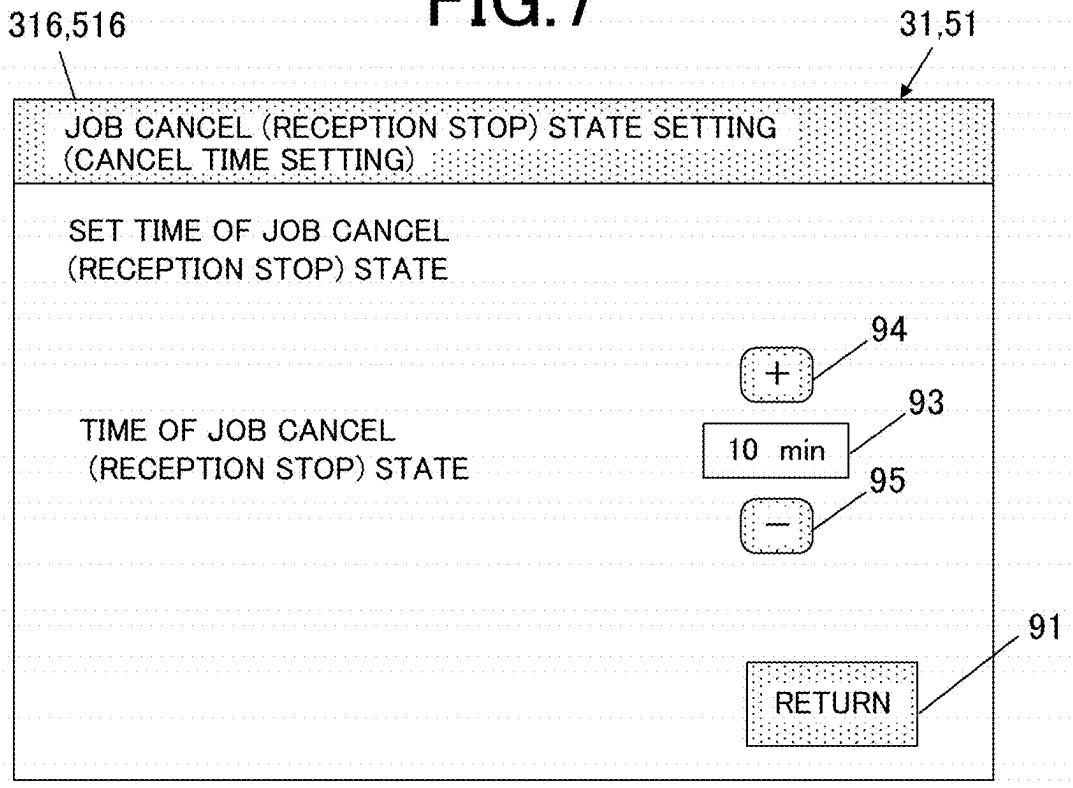

316,516
31,51
JOB CANCEL (RECEPTION STOP) STATE SETTING
(CANCEL TIME SETTING)
SET TIME OF JOB CANCEL
(RECEPTION STOP) STATE
94
+
93
TIME OF JOB CANCEL
(RECEPTION STOP) STATE
10 min
95
−
91
RETURN

FIG.8

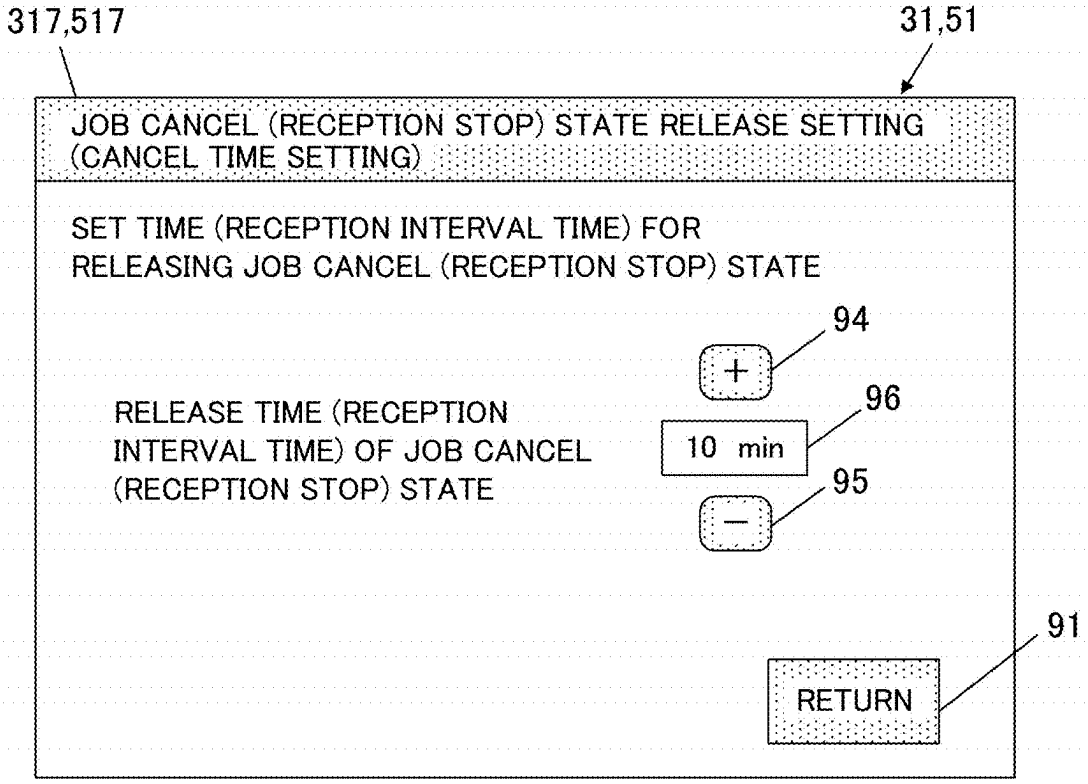

317,517
31,51
JOB CANCEL (RECEPTION STOP) STATE RELEASE SETTING
(CANCEL TIME SETTING)
SET TIME (RECEPTION INTERVAL TIME) FOR
RELEASING JOB CANCEL (RECEPTION STOP) STATE
94
RELEASE TIME (RECEPTION
INTERVAL TIME) OF JOB CANCEL
(RECEPTION STOP) STATE
96
10 min
95
91
RETURN

FIG.9

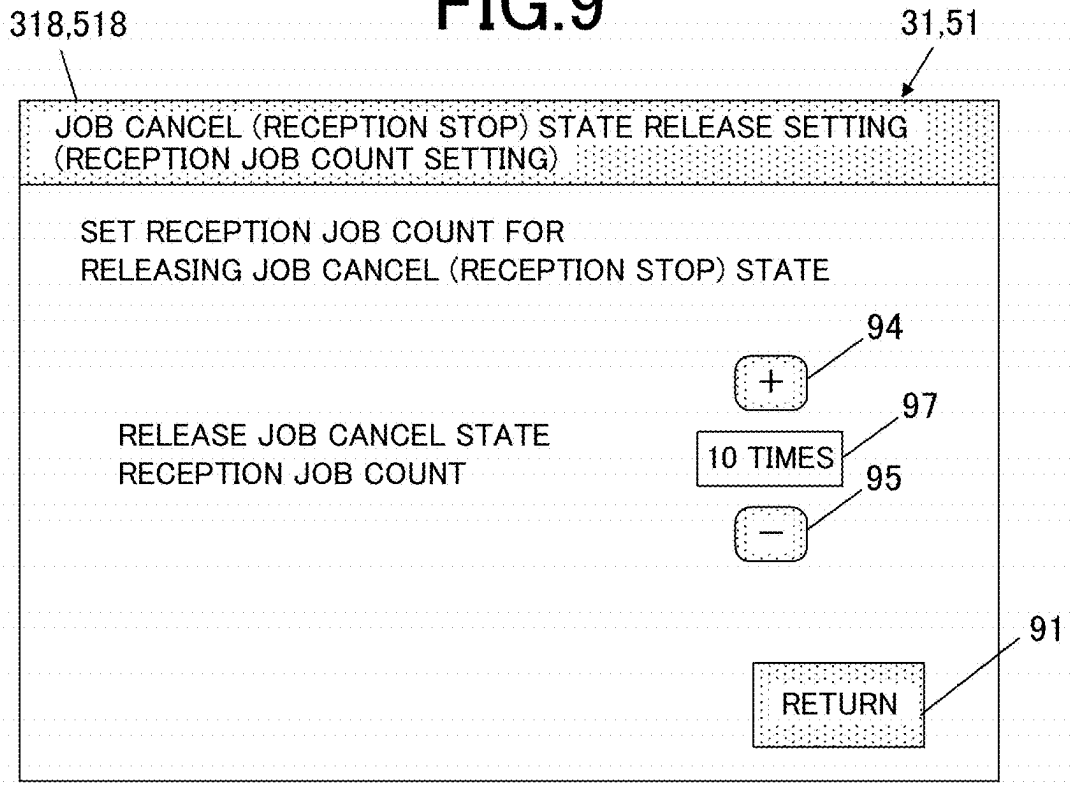

318,518
31,51
JOB CANCEL (RECEPTION STOP) STATE RELEASE SETTING
(RECEPTION JOB COUNT SETTING)
SET RECEPTION JOB COUNT FOR
RELEASING JOB CANCEL (RECEPTION STOP) STATE
94
RELEASE JOB CANCEL STATE
RECEPTION JOB COUNT
97
10 TIMES
95
91
RETURN

FIG.10

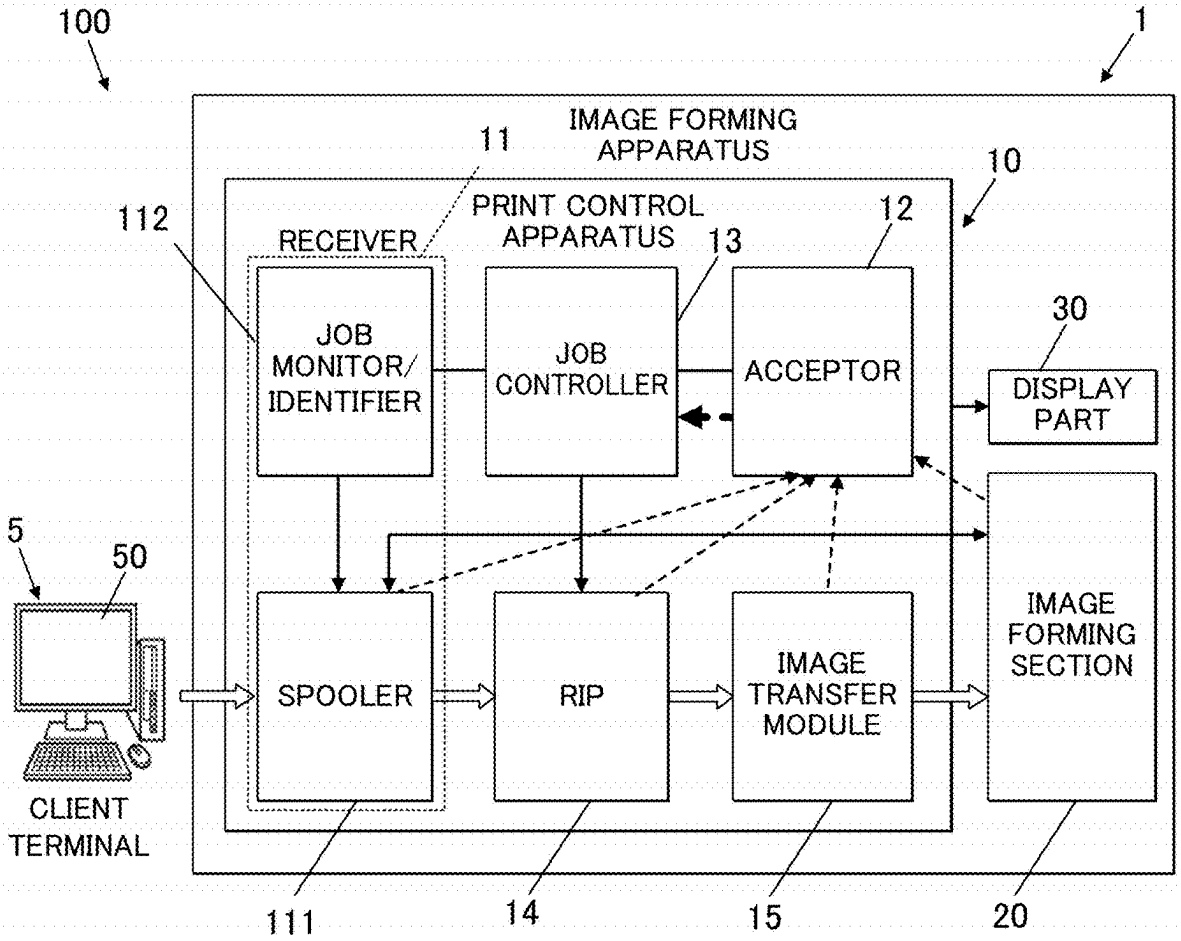

100
1
IMAGE FORMING APPARATUS
11
10
112
PRINT CONTROL APPARATUS
12
RECEIVER
13
30
JOB MONITOR/ IDENTIFIER
JOB CONTROLLER
ACCEPTOR
DISPLAY PART
5
50
IMAGE FORMING SECTION
SPOOLER
RIP
IMAGE TRANSFER MODULE
CLIENT TERMINAL
111
14
15
20

FIG.11

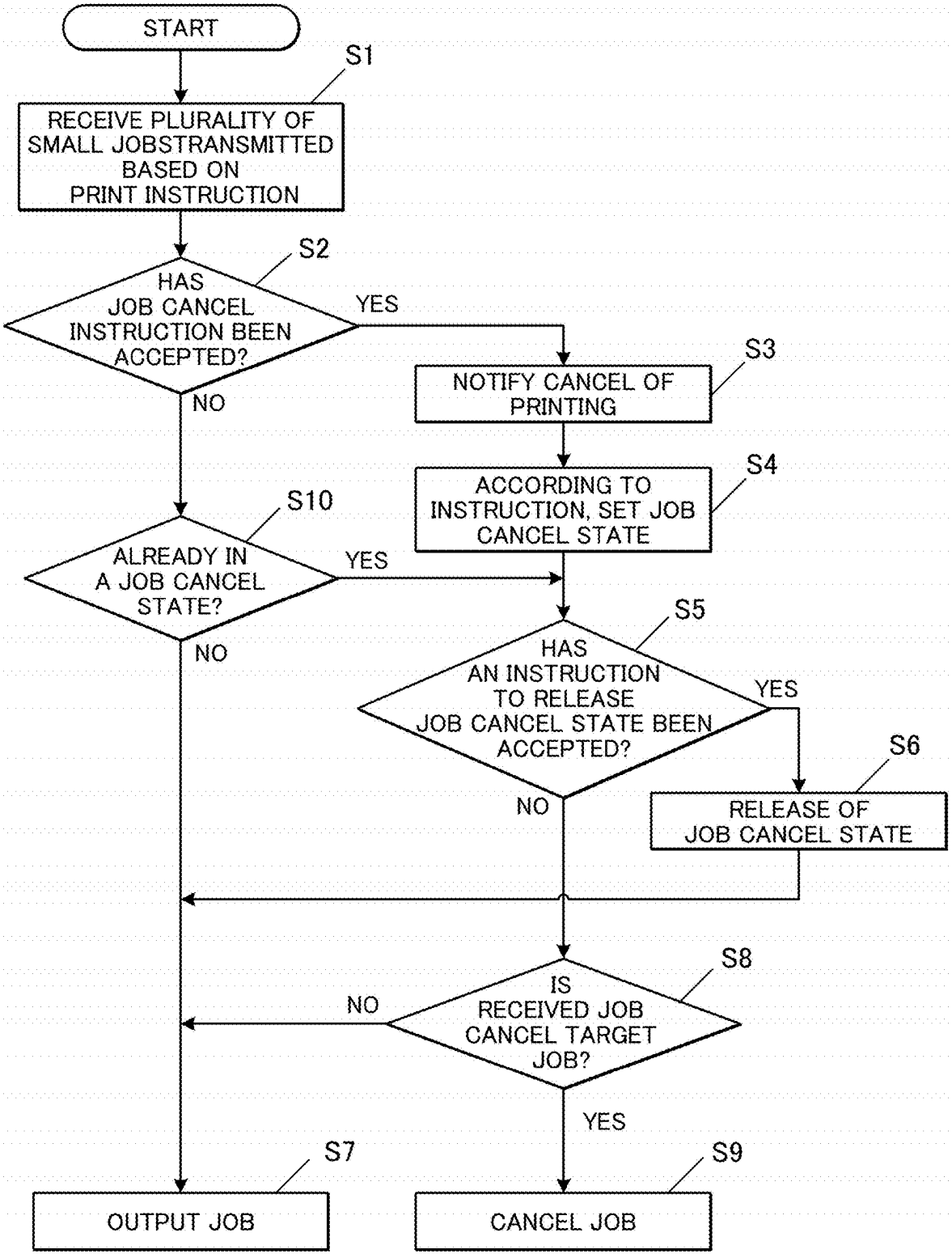

START
S1
RECEIVE PLURALITY OF SMALL JOBSTRANSMITTED BASED ON PRINT INSTRUCTION
S2
HAS JOB CANCEL INSTRUCTION BEEN ACCEPTED?
YES
NO
S3
NOTIFY CANCEL OF PRINTING
S4
ACCORDING TO INSTRUCTION, SET JOB CANCEL STATE
S10
ALREADY IN A JOB CANCEL STATE?
YES
NO
S5
HAS AN INSTRUCTION TO RELEASE JOB CANCEL STATE BEEN ACCEPTED?
YES
NO
S6
RELEASE OF JOB CANCEL STATE
S8
IS RECEIVED JOB CANCEL TARGET JOB?
NO
YES
S7
OUTPUT JOB
S9
CANCEL JOB

FIG.12

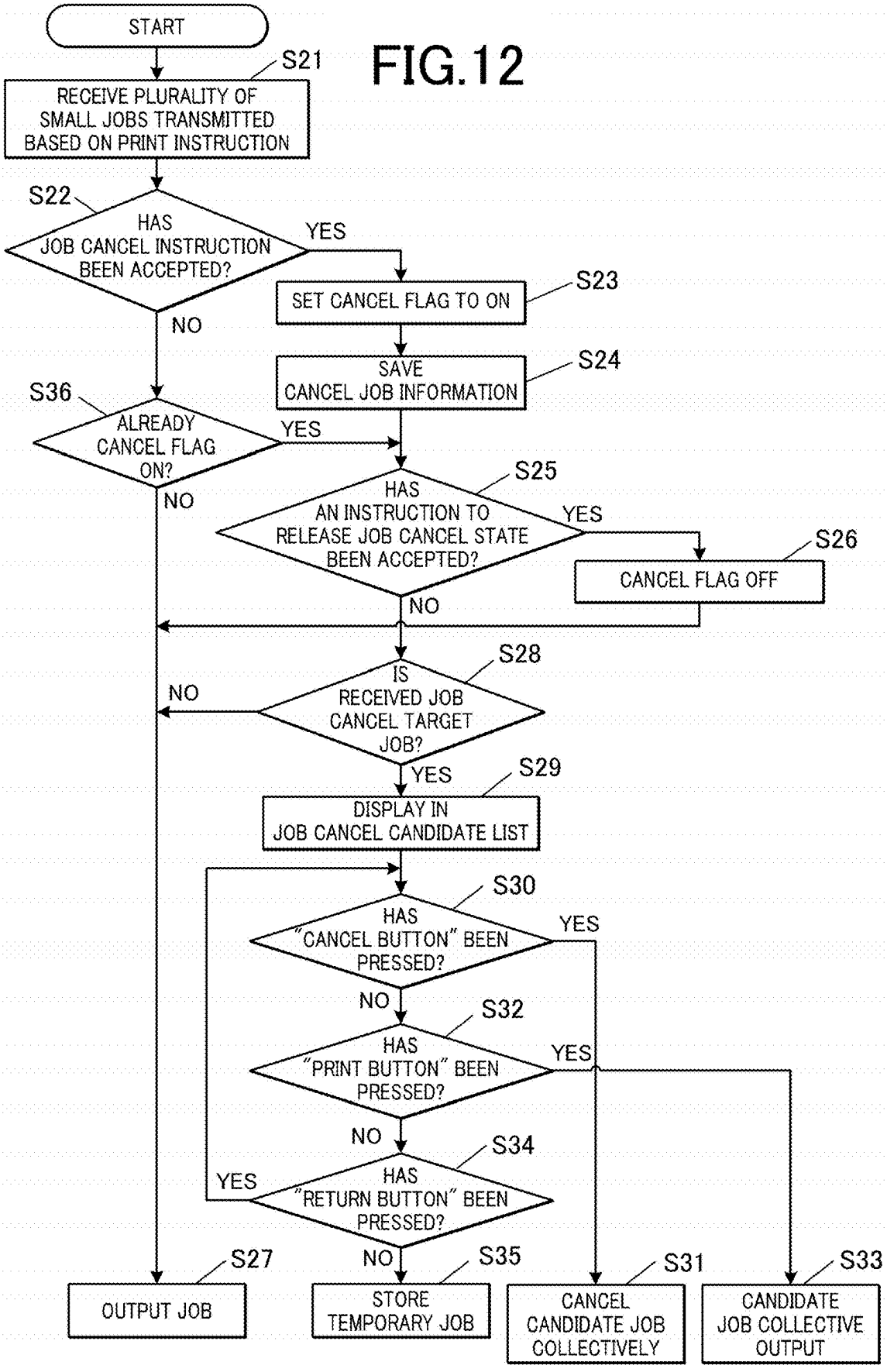

START
S21
RECEIVE PLURALITY OF SMALL JOBS TRANSMITTED BASED ON PRINT INSTRUCTION
S22
HAS JOB CANCEL INSTRUCTION BEEN ACCEPTED?
YES
NO
S23
SET CANCEL FLAG TO ON
S24
SAVE CANCEL JOB INFORMATION
S36
ALREADY CANCEL FLAG ON?
YES
NO
S25
HAS AN INSTRUCTION TO RELEASE JOB CANCEL STATE BEEN ACCEPTED?
YES
NO
S26
CANCEL FLAG OFF
S28
IS RECEIVED JOB CANCEL TARGET JOB?
NO
YES
S29
DISPLAY IN JOB CANCEL CANDIDATE LIST
S30
HAS "CANCEL BUTTON" BEEN PRESSED?
YES
NO
S32
HAS "PRINT BUTTON" BEEN PRESSED?
YES
NO
S34
HAS "RETURN BUTTON" BEEN PRESSED?
YES
NO
S27
OUTPUT JOB
S35
STORE TEMPORARY JOB
S31
CANCEL CANDIDATE JOB COLLECTIVELY
S33
CANDIDATE JOB COLLECTIVE OUTPUT

FIG.13

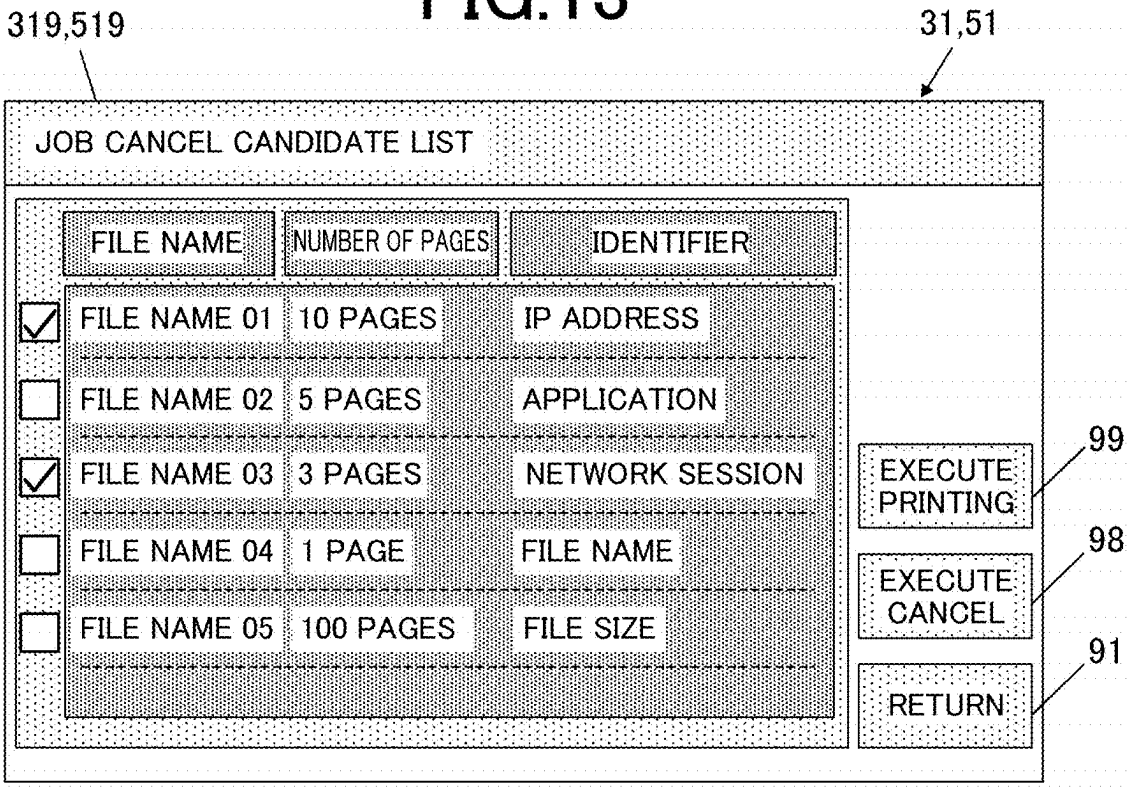

319,519
31,51
JOB CANCEL CANDIDATE LIST
FILE NAME
NUMBER OF PAGES
IDENTIFIER
FILE NAME 01
10 PAGES
IP ADDRESS
FILE NAME 02
5 PAGES
APPLICATION
FILE NAME 03
3 PAGES
NETWORK SESSION
FILE NAME 04
1 PAGE
FILE NAME
FILE NAME 05
100 PAGES
FILE SIZE
EXECUTE PRINTING
99
EXECUTE CANCEL
98
RETURN
91

FIG.14

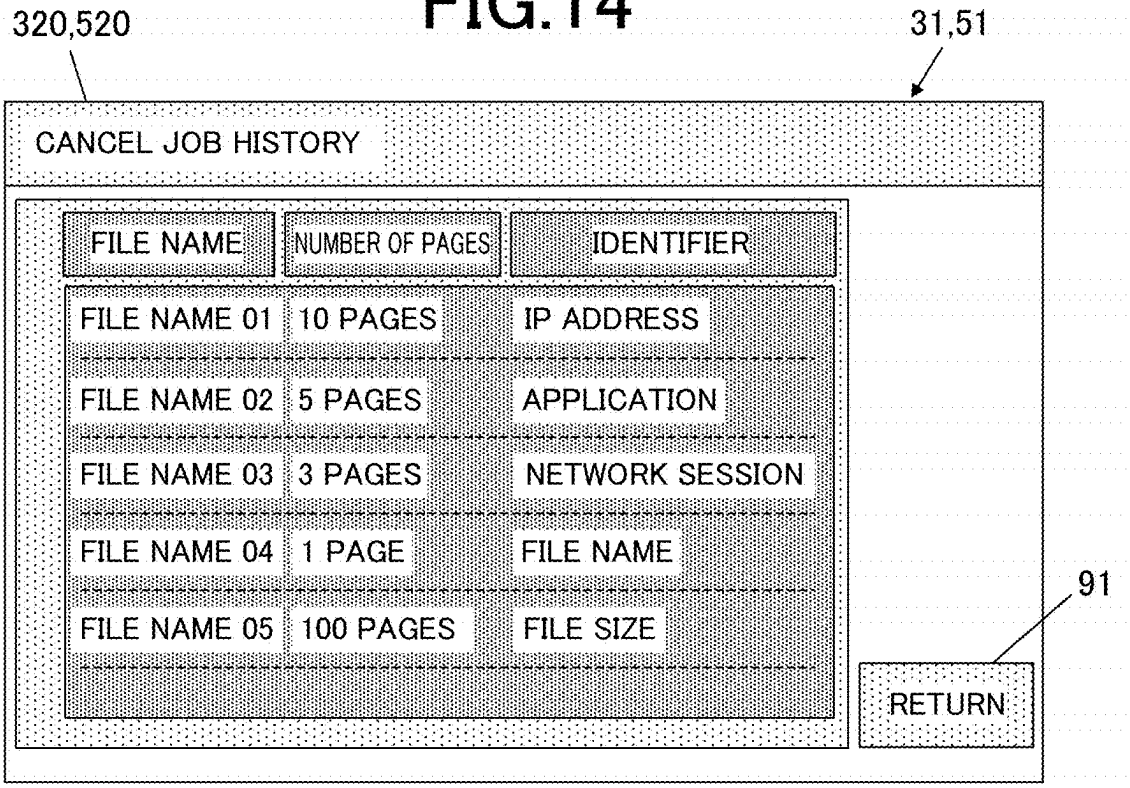
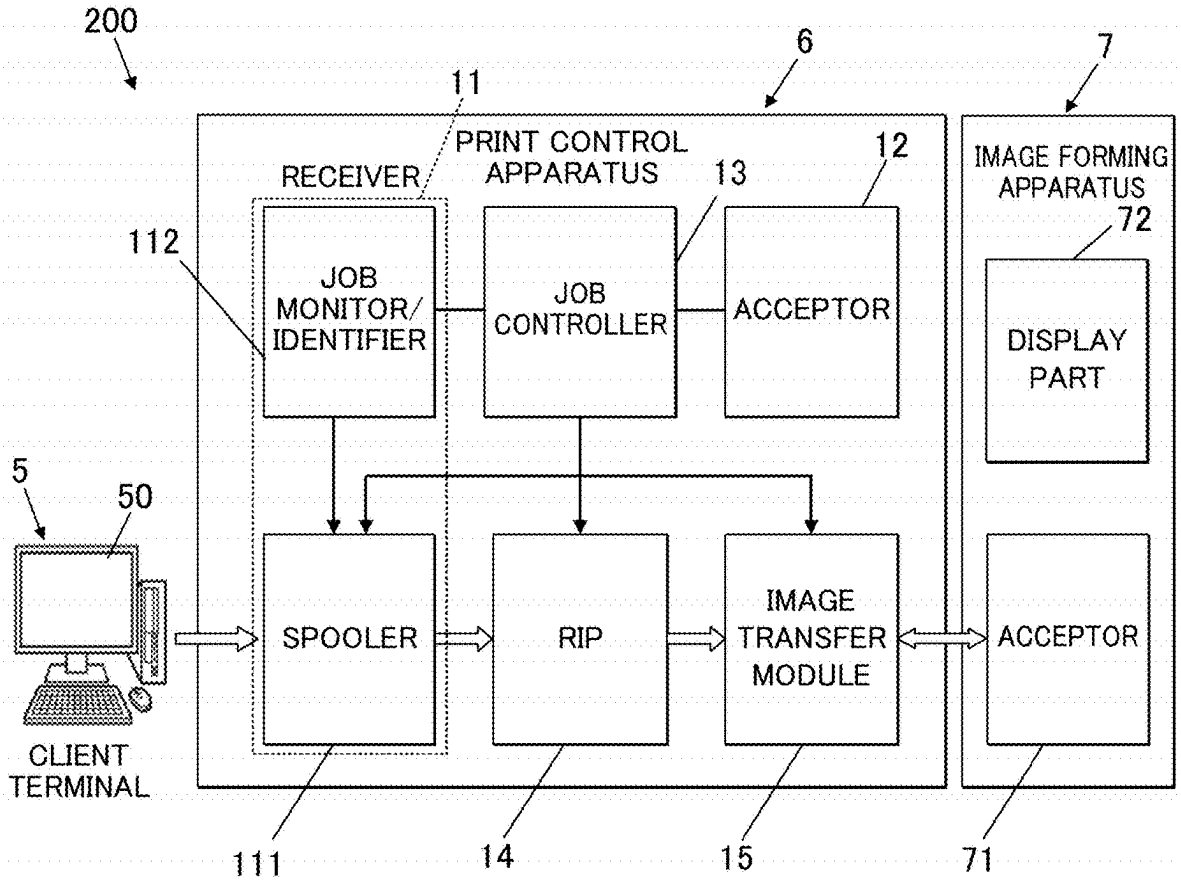

320,520
31,51
CANCEL JOB HISTORY
FILE NAME
NUMBER OF PAGES
IDENTIFIER
FILE NAME 01
10 PAGES
IP ADDRESS
FILE NAME 02
5 PAGES
APPLICATION
FILE NAME 03
3 PAGES
NETWORK SESSION
FILE NAME 04
1 PAGE
FILE NAME
FILE NAME 05
100 PAGES
FILE SIZE
RETURN
91

FIG.15


200
6
7
11
PRINT CONTROL APPARATUS
RECEIVER
12
13
IMAGE FORMING APPARATUS
72
112
JOB MONITOR/ IDENTIFIER
JOB CONTROLLER
ACCEPTOR
DISPLAY PART
5
50
SPOOLER
RIP
IMAGE TRANSFER MODULE
ACCEPTOR
CLIENT TERMINAL
111
14
15
71

PRINT CONTROL APPARATUS, PRINT CONTROL SYSTEM, AND STORAGE MEDIUM

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The entire disclosure of Japanese Patent Application No. 2024-018349 filed on Feb. 9, 2024, is incorporated herein by reference in its entirety.

BACKGROUND OF THE INVENTION

Technical Field

[0002] The present invention relates to a print control apparatus, a print control system, and a storage medium.

Description of Related Art

[0003] Conventionally, jobs of a small size (hereinafter referred to as "small job") are continuously sent to an image forming apparatus to sequentially perform printing in some cases. In such printing, even if the printing is cancelled due to some trouble during the printing, the cancel is not completed in time, and most of the jobs are printed.

[0004] In this regard, for example, Japanese Unexamined Patent Publication No. 2010-282412 discloses a technique of stopping printing after cancel by also monitoring and canceling a job in a spooler.

[0005] However, the technology described in Japanese Unexamined Patent Publication No. 2010-282412 can cope with only cancel from a client-terminal side, and does not consider cancel from the image forming apparatus-side. In addition, a job that enters after cancel is not cancelled. Therefore, it has been difficult to quickly stop subsequent jobs when a trouble occurs.

SUMMARY OF THE INVENTION

[0006] The present invention has been conceived in consideration of the above-described points, and an object of the present invention is to provide a print control apparatus, a print control system, and a storage medium that can promptly stop subsequent jobs upon accepting a job cancel instruction.

[0007] To achieve at least one of the abovementioned objects, according to an aspect of the present invention, a print control apparatus reflecting one aspect of the present invention is a print control apparatus including: a hardware processor, wherein the hardware processor, receives a plurality of small jobs transmitted from a client terminal based on a print instruction, performs control to perform printing based on the received small jobs, accepts a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction, and when the job cancel instruction is accepted during reception of the plurality of small jobs, performs control such that the printing based on the small jobs is terminated or interrupted.

[0008] According to an aspect of the present invention, a print control system reflecting one aspect of the present invention is a print control system, including: a hardware processor, wherein the hardware processor, receives a plurality of small jobs transmitted from a client terminal based on a print instruction, performs control to perform printing based on the received small jobs, and accepts a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction; a print control apparatus; a client terminal that transmits a plurality of small jobs based on the print instruction; and an image forming apparatus that executes a printing operation for the small job, wherein, the hardware processor performs control so as to terminate or interrupt printing based on the small job when the job cancel instruction is accepted during reception of the plurality of small jobs.

[0009] According to an aspect of the present invention, a storage medium reflecting one aspect of the present invention is a non-transitory computer-readable storage medium storing a program causing a computer that controls a printing operation to execute, receiving a plurality of small jobs transmitted from a client terminal based on a print instruction, performing control to perform printing based on the received small job; accepting a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction, and when the job cancel instruction is accepted during reception of the plurality of small jobs, performing control such that the printing based on the small jobs is terminated or interrupted.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] The advantages and features provided by one or more embodiments of the invention will become more fully understood from the detailed description given hereinafter and the appended drawings which are given by way of illustration only, and thus are not intended as a definition of the limits of the present invention, and wherein:

[0011] FIG. **1** is a main part system configuration diagram illustrating a schematic configuration of a print control system including a print control apparatus according to a first embodiment;

[0012] FIG. **2** is an example of a job cancel setting screen for performing job cancel setting displayed on an operation screen of a display part according to the present embodiment;

[0013] FIG. **3** is an example of a cancel state screen displayed on the operation screen of the display part according to the present embodiment;

[0014] FIG. **4** is an example of a cancel target setting screen displayed on the operation screen of the display part according to the present embodiment;

[0015] FIG. **5** is an example of a release condition setting screen displayed on the operation screen of the display part according to the present embodiment;

[0016] FIG. **6** is an example of an inquiry screen displayed on the operation screen of the display part according to the present embodiment;

[0017] FIG. **7** is an example of a cancel time setting screen displayed on the display screen of the display part according to the present embodiment;

[0018] FIG. **8** is an example of a reception interval setting screen displayed on the operation screen of the display part according to the present embodiment;

[0019] FIG. **9** is an example of a reception job count setting screen displayed on the operation screen of the display part according to the present embodiment;

[0020] FIG. **10** is an explanatory diagram for explaining a case in which a job cancel instruction is accepted from each unit of the apparatus in the print control system according to the present embodiment;

[0021] FIG. **11** is a flowchart describing print control in the print control system including the print control apparatus according to the first embodiment;

[0022] FIG. **12** is a flowchart describing print control in the print control system including the print control apparatus according to a second embodiment;

[0023] FIG. **13** is an example of a job cancel candidate list screen displayed on the operation screen of the display part according to the present embodiment;

[0024] FIG. **14** is an example of a cancel job history screen displayed on the operation screen of the display part according to the present embodiment; and

[0025] FIG. **15** is a main part system configuration diagram illustrating a schematic configuration of a print control system including a print control apparatus according to a third embodiment.

DETAILED DESCRIPTION

[0026] Hereinafter, one or more embodiments of the present invention will be described with reference to the drawings. However, the scope of the invention is not limited to the disclosed embodiments.

[0027] Below, with reference to the drawings, embodiments of a print control apparatus, a print control system, and a storage medium according to the present embodiment will be described. It should be noted that the following embodiments are provided with various limitations that are technically preferable for carrying out the present invention, but the scope of the present invention is not limited to the following embodiments and illustrated examples.

First Embodiment

[Configuration of Print Control System]

[0028] According to the present embodiment, the print control apparatus is included in a print control system.

[0029] FIG. **1** is a diagram illustrating a schematic configuration of a print control system according to a first embodiment.

[0030] As illustrated in FIG. **1**, the print control system **100** according to the present embodiment includes an image forming apparatus **1** and a client terminal **5**. The image forming apparatus **1** and the client terminal **5** are connected to various communication networks, for example, a LAN and are communicable with each other via the communication networks. Note that a communication method between the image forming apparatus **1** and the client terminal **5** is not particularly limited.

[0031] The client terminal **5** is, for example, a computer device such as a personal computer (PC) operated by a user. The client terminal **5** may be a portable device such as a tablet PC.

[0032] In accordance with a user's operation or the like, the client terminal **5** transmits a plurality of small jobs based on a print instruction to the image forming apparatus **1** via the communication network.

[0033] According to the present embodiment, the plurality of small jobs are a plurality of jobs divided so that a size of one unit is small. It is assumed that a plurality of small jobs having such a small size are successively sent from the client terminal **5**. As such a print job, a job (variable printing) in which a part of a document includes a variable element (so-called variable element) is conceivable.

[0034] For example, variable printing is performed in which a name field, an amount of money field, and the like are different for each person and other parts are common in a leaflet addressed to an individual, various usage specifications, and the like. In such variable printing, a document for one person including variable elements is defined as one job. Then, a plurality of small jobs divided one by one are sent from the client terminal **5** to the image forming apparatus **1**, for example, in a group corresponding to the number of persons. Note that the "plurality of small jobs" are not limited to jobs related to variable printing.

[0035] The client terminal **5** accesses, for example, the print control apparatus **10** of the image forming apparatus **1**, and causes the display part **50** (see FIG. **2** and the like) to display an operation screen **51** (see FIG. **2** and the like) provided by the print control apparatus **10**. Then, when the user performs an operation of inputting an instruction from the operation screen **51**, an operation instruction signal according to the operation is transmitted to the print control apparatus **10** of the image forming apparatus **1**.

[0036] Note that although not illustrated, the client terminal **5** itself may include a job management application program (hereinafter referred to as "job management AP") and the like. In this case, even when the operation screen **51** or the like is not provided from the print control apparatus **10** side, the operation screen by the job management AP can be displayed on the display part **50**.

[0037] The image forming apparatus **1** includes an image forming section **20** and a print control apparatus **10** (hardware processor). The print control apparatus **10** is a controller that controls an operation (printing operation) and the like by the image forming section **20**. The print control apparatus **10** and the image forming section **20** can transmit and receive information to and from each other.

[0038] The image forming section **20** forms an image on a medium such as various types of sheets.

[0039] That is, the image forming section **20** is a printer that executes a print job in accordance with a print instruction received from the print control apparatus **10**. A method of image formation in the image forming section **20** is not particularly limited. That is, the image forming section **20** may form the image by an electrophotographic method approach. Alternatively, the image may be formed by an inkjet method. Furthermore, the image forming section **20** may be a color printer or a monochrome printer.

[0040] The print control apparatus **10** is, for example, a computer including a controller configured of a central processing unit (CPU) or the like, a read only memory (ROM) which is a non-volatile memory, a random access memory (RAM) which is a volatile memory, and the like (all of which are not illustrated). The CPU, the ROM, and the RAM are connected to one another by an internal bus (not illustrated). The CPU reads various processing programs stored in, for example, the ROM and develops the programs in the RAM. Next, in cooperation with various programs expanded in the RAM, the CPU comprehensively controls operation of each part of the image forming apparatus **1** including the print control apparatus **10** and the image forming section **20**, and performs various kinds of processing.

[0041] FIG. **1** illustrates a functional configuration of the print control apparatus.

[0042] As illustrated in FIG. **1**, the print control apparatus **10** includes a receiver **11**, an acceptor **12**, and a job con-

troller **13**. The print control apparatus further includes a raster image processor (RIP) **14** and an image transfer module **15**.

[0043] The receiver **11** receives the above-described "plurality of small jobs" from the client terminal **5**.

[0044] Specifically, the receiver **11** receives, at a spooler **111**, a print job (print data) transmitted from the client terminal **5** via the communication network.

[0045] The print data received by the spooler **111** is sequentially transmitted to the RIP **14**. In the RIP **14**, the print data is converted into image data that can be printed by the image forming section **20**. The converted data is transmitted to the image transfer module **15**. The image transfer module **15** transmits the converted image data to the image forming section **20**. Thus, the image forming section **20** can execute the print job in accordance with the print instruction (print operation in accordance with the print data).

[0046] The receiver **11** according to the present embodiment includes a job monitor/identifier **112** in addition to the spooler **111**.

[0047] The job monitor/identifier **112** transitions to a cancel state when the acceptor **12**, which is described later, accepts a job cancel instruction. Then, a print job newly input to the spooler **111** is monitored.

[0048] The job monitor/identifier **112** of the receiver **11** can analyze characteristics of job data (print data) received from the client terminal **5**. When the job monitor/identifier **112** shifts to the cancel state, it judges whether a print job newly input to the spooler **111** is a cancel target. Specifically, it is analyzed whether or not the feature is common to the job data received at the time when the acceptor **12** accepts the job cancel instruction among the jobs newly received by the receiver **11**. The analysis result of the job monitor/identifier **112** is output to the job controller **13**.

[0049] The print job that is analyzed by the job monitor/identifier **112** as having common features with the job data received at the time point when the acceptor **12** accepts the job cancel instruction is determined by the job controller **13** to be the cancel target. Next, the job controller **13** stops (cancels) the operation of each part related to printing for the job determined to be the cancel target.

[0050] When the cancel state of the job monitor/identifier **112** is released, the print job received by the spooler **111** is sent to the image forming section **20** and output (printed) as usual.

[0051] Job identification in the job monitor/identifier **112** as to whether or not the print job newly entering the receiver **11** is to be the cancel target will be described in detail later.

[0052] In what case the cancel state of the job monitor/identifier **112** is released will also be described in detail later.

[0053] The acceptor **12** accepts a job cancel instruction which is a printing terminate instruction or a printing interruption instruction. That is, when the user performs an operation input of an instruction to cancel the print job from the operation screen **51** or the like of the client terminal **5**, an operation instruction signal corresponding to the input is output to the print control apparatus **10**. When the operation instruction signal is sent to the print control apparatus **10**, the acceptor **12** accepts the instruction content corresponding to the operation instruction signal.

[0054] Note that on what the user performs operation input is not limited to the operation screen **51** of the client terminal **5**. For example, the display part **30** may be provided in the image forming apparatus **1** including the print control apparatus **10** (see FIG. **1**). In this case, the user may perform operation input from an operation screen **31** (see FIG. **2** and the like) displayed on the display part **30** of the image forming apparatus **1**. In this case, the acceptor **12** accepts instruction content corresponding to the operation instruction input from the operation screen **31** of the image forming apparatus **1**. Note that in the following description, a reference sign such as "operation screen **31** or **51**" indicates that either the operation screen **51** of the client terminal **5** or the operation screen **31** of the image forming apparatus **1** may be used.

[0055] When the acceptor **12** accepts the instruction, the acceptor **12** transmits the accepted instruction content to the job controller **13** described later.

[0056] Note that among the job cancel instructions, the "printing terminate instruction" is an instruction to stop both the printing operation of the print job and the reception of the print instruction. In other words, when the acceptor **12** accepts an instruction to terminate printing, the job controller **13**, which will be described later, stops printing of the job that has already been received and is being printed. That is, not only the printing operation in the image forming section **20** is stopped, but also all the jobs remaining in the spooler **111**, the RIP **14**, the image transfer module **15** and the like are cancelled (processing is stopped). Thus, the printing operation is prevented from proceeding any further. The job controller **13** also stops printing of the job newly received by the receiver **11**. Furthermore, after the time point at which the terminate instruction is accepted, the reception of the print instruction by the receiver **11** is also stopped.

[0057] In contrast, among the job cancel instructions, the "printing interruption instruction" is an instruction to stop the printing operation of the print job. That is, when the acceptor **12** has accepted the printing interruption instruction, the job controller **13** stops printing of the job that has already been received and is being printed. As in the case of the "printing terminate instruction", the term "stop" means not only stopping the printing operation in the image forming section **20** but also canceling (stopping the processing of) all jobs remaining in the spooler **111**, the RIP **14**, the image transfer module **15**, and the like. In addition, although printing of the job newly received by the receiver **11** is also stopped, reception of a print instruction by the receiver **11** is continued even after a time point at which an interruption instruction is accepted. In this case, the received job is stored and accumulated in the spooler **111** to be put on hold, and the transfer of the job to the image forming section **20** is stopped. Note that the job to be interrupted or terminated based on the job cancel instruction is, for example, the small job received when the job cancel instruction is accepted, or the small job to be printed next after the small job currently being printed.

[0058] Whether the job cancel instruction is the printing terminate instruction or the printing interruption instruction is instructed by the user's operation input from the operation screen **31** or **51**, for example.

[0059] For example, according to the present embodiment, the job cancel setting screens **311** and **511** can be displayed on the operation screen **51** of the client terminal **5**, the operation screen **31** of the image forming apparatus **1**, or the like.

[0060] FIG. **2** is a view illustrating an example of a job cancel setting screen displayed on the operation screen. When the user wants to set the job cancel, job cancel setting

screens **311** and **511** as illustrated in FIG. **2** are displayed on the operation screens **31** and **51**.

[0061] As illustrated in FIG. **2**, the content (type) of job cancel can be set on the job cancel setting screens **311** and **511**.

[0062] For example, when 1) is selected by the user, only the received job is cancelled (stopped). In this case, the job controller **13** controls each part so that the received job is not printed after the time point of acceptance of the job cancel instruction.

[0063] For example, when 2) is selected, the job controller **13** cancels (stops) the received job. Then, the job controller **13** performs control so that no new job is received after the time point of acceptance of the job cancel instruction (terminate instruction).

[0064] Furthermore, for example, when 3) is selected, the job controller **13** cancels (stops) the received job. Then, the job controller **13** continues reception of the new job after the time point of acceptance of the job cancel instruction, but performs control as a suspended state so that the job is not printed (interruption instruction). For example, the processing of each section is stopped, such as stopping transfer to the image forming section **20**.

[0065] Note that in the illustrated example, it is possible to return from the job cancel setting screens **311** and **511** to the initial screen (not illustrated) or the like by operating a "return button" **91**.

[0066] In the job cancel setting screens **311** and **511**, when the user selects any one of 1) to 3), the job cancel instruction having content corresponding to the selection is input. When the job cancel instruction is input, the acceptor **12** accepts the job cancel instruction in accordance with the operation. Next, the job cancel instruction accepted by the acceptor **12** is output to the job controller **13**. In this case, when the job controller **13** receives the job cancel instruction, it is preferable that the job controller **13** causes the operation screens **31**, **51**, or the like to display the cancel state screens **312**, **512** indicating that the job cancel is being executed (continued).

[0067] FIG. **3** shows an example of a cancel state screen when, for example, "2)" in FIG. **2** is selected. In FIG. **3**, it is displayed that printing of the received job is stopped, and furthermore, reception of the new job after the time point of acceptance of the job cancel instruction is also stopped. As shown in FIG. **3**, it is preferable that a "cancel release button" **92** for releasing the cancel state is displayed on the cancel state screens **312**, **512**.

[0068] Note that printing of all received jobs and reception of all new jobs may be stopped during execution of job cancel (during continuation), but in the present embodiment, the job monitor/identifier **112** identifies whether or not a newly input print job is the cancel target.

[0069] That is, when the job cancel instruction is accepted by the acceptor **12**, the acceptance of the job cancel instruction is notified to the job monitor/identifier **112** via the job controller **13**. Thus, as described above, the job monitor/identifier **112** enters the cancel state, monitors the print job newly entering the spooler **111**, and judges whether or not the print job is the cancel target.

[0070] When the job cancel is continued, the user can set, for example, on the operation screen **31** or **51**, what print jobs the job monitor/identifier **112** judges to be the cancel target.

[0071] FIG. **4** illustrates an example of a cancel target setting screen for setting the type of the print job as the cancel target when job cancel is continued.

[0072] In FIG. **4**, six cases are given as examples of jobs to be the cancel target.

[0073] For example, the job is the job from the same IP address as that received when the job cancel instruction is accepted, the job from the same application, or the job transmitted from the same network session. In such a case, it can be estimated that the job is a series of jobs transmitted by the same user.

[0074] Further, for example, if the job has the same file name as that received when the job cancel instruction is accepted, it can be considered that a series of jobs continues. Further, for example, there is a case where the print job is a job having the same file size as that received when the job cancel instruction is accepted. In this case, it is highly likely that a series of small jobs is continuing.

[0075] Furthermore, when job cancel is continued, the job monitor/identifier **112** may also monitor and detect the content of the print job. For example, there is a case where job data constituting a print job has a similar configuration to that of a job that has been received when the job cancel instruction has been accepted. In this case, it is highly likely that a series of small jobs is continuing.

[0076] The "same configuration" is, for example, a case where the number of images, the number of graphics, the number of texts, and the like of the job data constituting the print job are the same. In such a case, the job monitor/identifier **112** judges which print job is to be the cancel target.

[0077] Note that in the case of a job with "similar file size" or a job with "similar configuration", a threshold for judging "similar" is provided. Then, if it is within the range of the threshold, it is preferable that it is judged as "similar" in the job monitor/identifier **112**.

[0078] In contrast, in a case where the IP address or the like of the transmission source has changed, a case where the file name has changed, or the like, there is a high possibility that the user, the content of the job, or the like has been switched. For example, there is a possibility that a job transmitted from a different application is an interrupt job different from the job received when the job cancel instruction is accepted. Furthermore, in a case where the file size or configuration of the job has changed, it is highly likely that the job has been switched from the series of small jobs that were being received when the job cancel instruction was accepted to another job.

[0079] Therefore, in such a case, the job monitor/identifier **112** judges that the newly received job is not to be the cancel target. For a job that is not to be the cancel target, the job controller **13** controls each part of the apparatus so that printing is performed as usual.

[0080] In this way, even if the user does not individually judge whether or not the job is to be the cancel target or does not set each time, it is possible to automatically judge the job to be the cancel target if a certain condition is satisfied. Therefore, the burden on the user is reduced.

[0081] It should be noted that what is shown in FIG. **4** is an example, and elements for judging whether or not to judge as the cancel target may be other than what is shown here. Furthermore, even the items listed in FIG. **4** may be

customizable, such as being appropriately removed if the user wants to remove the item from the item for judging the cancel target.

[0082] The acceptor **12** according to the present embodiment can accept a release instruction to release the job cancel instruction in addition to the job cancel instruction from the user.

[0083] The release instruction is an instruction to release the job cancel instruction after the accepting unit accepts the job cancel instruction from the user. For example, the user can manually release the job cancel state by operating the "cancel release button" **92** in FIG. **3**. In addition, according to the present embodiment, a condition for releasing the job cancel state can be defined in advance. In this case, when the defined condition is satisfied, it is determined that there is a release instruction, and the job cancel state is automatically released.

[0084] When the acceptor **12** has accepted the release instruction, the job controller **13** described later resumes, at the timing of acceptance of the release instruction, the operation of each section that has been stopped in accordance with the job cancel instruction. As a result, for example, the cancel state of the job monitor/identifier **112** is also released. In a case where reception of a new job by the receiver **11** or the like has been stopped, the reception is resumed.

[0085] Note that the "timing at which the release instruction has been accepted" is a timing at which the "cancel release button" **92** has been operated in a case of release by the user's operation of the "cancel release button" **92**. In addition, in a case of automatic release in a case where a predetermined release condition is satisfied, it is timing at which the release condition is satisfied.

[0086] According to the present embodiment, the user can also set when to release the job cancel state, that is, the release condition of the job cancel state from the operation screen **31**, **51**, or the like.

[0087] FIG. **5** is an example of a release condition setting screen for setting a release condition under which the job cancel state is released.

[0088] For example, in the example illustrated in FIG. **5**, in 1), the job cancel state is released after a predetermined set time has elapsed since the acceptor **12** has accepted the job cancel instruction. Furthermore, in a case where the reception interval becomes equal to or longer than a predetermined time in 2), the job cancel state is released. In addition, in 3), the job cancel state is released when the number of times of reception reaches a predetermined number of times. Furthermore, in 4), the job cancel state is released when the session is disconnected.

[0089] FIG. **6** is an example of the inquiry screen **315**, **515** inquiring whether to perform setting of "4)". When the user selects "set" in the inquiry screens **315** and **515** illustrated in FIG. **6**, the field of "4)" enters a selected state in the release condition setting screens **314** and **514** in FIG. **5**.

[0090] In any case, the job cancel state is automatically released at a timing when there is a possibility that the situation has changed from the time when the job cancel instruction is received. Note that the release condition is not limited to the condition illustrated in FIG. **5**. In addition, it may be possible to customize by the user, such as adding any condition to the release condition.

[0091] When the user selects one of the exemplified condition on the release condition setting screens **314** and **514**, the job cancel state is released when the selected release condition is satisfied. FIG. **5** illustrates a case where "1)" is selected by the user.

[0092] In a case where the user selects "1)", for example, cancel time setting screens **316** and **516** as illustrated in

[0093] FIG. **7** are further displayed on the operation screens **31** and **51** or the like. On the cancel time setting screens **316** and **516**, it is possible to set how long the job cancel state continues to release the job cancel state or set a timeout time. In this case, the job monitor/identifier **112** measures, with the timer function, an elapsed time from the shift to the job cancel state.

[0094] For example, in the example illustrated in FIG. **7**, a set time display field **93**, a "plus button" **94** for lengthening the set time, and a "minus button" **95** for shortening the set time are displayed on the screen.

[0095] In the illustrated example, the setting is such that the job cancel state is released after 10 minutes have elapsed since the acceptor **12** accepted the job cancel instruction.

[0096] Further, when the user selects "2)", for example, reception interval setting screens **317** and **517** as shown in FIG. **8** are further displayed on the operation screens **31** and **51**. On the reception interval setting screens **317** and **517**, it is possible to set how long a state in which there is no reception from the client terminal **5** continues after the acceptor **12** accepts the job cancel instruction to release the job cancel state. Also in this case, the job monitor/identifier **112** measures, with the timer function, the elapsed time since the acceptor **12** accepted the job cancel instruction.

[0097] For example, in the example illustrated in FIG. **8**, a set time display field **96**, a "plus button" **94** for lengthening the set time, and a "minus button" **95** for shortening the set time are displayed on the screen.

[0098] In the illustrated example, the job cancel state is set to be released in a case where nothing is received from the client terminal for 10 minutes after the acceptor **12** has accepted the job cancel instruction.

[0099] Further, when the user selects "3)", for example, reception job count setting screens **318** and **518** as shown in FIG. **9** are further displayed on the operation screens **31** and **51**. On the reception job count setting screens **318** and **518**, it is possible to set how many times the job is received from the client terminal **5** after the acceptor **12** accepts the job cancel instruction to release the job cancel state. In this case, the job monitor/identifier **112** counts the number of jobs received from the client terminal **5**. Then, when the predetermined number of times is reached, it is judged that the release condition is satisfied.

[0100] For example, in the example shown in FIG. **9**, a count display field **97**, a "plus button" **94** for increasing the number of times, and a "minus button" **95** for decreasing the number of times are displayed on the screen.

[0101] In the illustrated example, the job cancel state is set to be released when a job is received from the client terminal **5** ten times.

[0102] Furthermore, according to the present embodiment, the acceptor **12** not only accepts user's operation input from the operation screens **31** and **51** or the like but also monitors the state of the apparatus. Then, when detecting an abnormality or the like of the apparatus, the acceptor **12** transmits, to the job controller **13**, a notification that the job being executed will be cancelled.

[0103] FIG. **10** is an explanatory diagram for explaining a case where the accepting unit accepts a job cancel instruc-

tion (cancel request) from each unit of the apparatus in the print control system of the present embodiment. In FIG. **10**, a cancel request from each unit of the apparatus is indicated by a broken line arrow. Furthermore, transmission of a cancel request from the acceptor **12** to the job controller **13** in this case is indicated by a thick broken line arrow.

[0104] To be specific, as illustrated in FIG. **10**, in a case where some abnormality occurs in the spooler **111** of the receiver **11**, the RIP **14**, the image transfer module **15**, or the image forming section **20**, a cancel request is notified from each of these sections to the acceptor **12**. Upon receiving the cancel request, the acceptor **12** notifies the job controller **13** to cancel the job being executed.

[0105] Note that the notification from the acceptor **12** to the job controller **13** preferably includes information on which component has developed the abnormality. In this case, for example, if an abnormality occurs in the RIP **14**, the image transfer module **15**, or the image forming section **20**, the job controller **13** may cancel the job by either "terminating printing" or "interrupting printing". On the other hand, when an abnormality has occurred in the spooler **111**, the job controller **13** notifies, as job cancel, each section of the apparatus of "terminate printing" to stop both the printing operation of the print job and the reception of the print instruction.

[Operation of Print Control System Including Print Control Apparatus and Print Control Method]

[0106] Next, an operation of the print control system **100** including the print control apparatus and a print control method will be described with reference to FIG. **11** and the like.

[0107] FIG. **11** is a flowchart illustrating a flow of cancel of a print job and release of a job cancel state according to the present embodiment.

[0108] As shown in FIG. **11**, when a plurality of small jobs are transmitted from the client terminal **5** to the image forming apparatus **1** based on a print instruction, the plurality of small jobs are received by the spooler **111** of the print control apparatus **10** (step S**1**).

[0109] The job controller **13** judges whether the acceptor **12** has accepted a job cancel instruction (step S**2**). That is, the job controller **13** judges as needed whether or not it has been notified by the acceptor **12** that it has accepted a job cancel instruction.

[0110] When notified by the acceptor **12** that the job cancel instruction has been accepted (step S**2**; YES), the job controller **13** notifies the sections of the apparatus such as the spooler **111** and the job monitor/identifier **112** which are the receiver **11**, the RIP **14**, the image transfer module **15** and the image forming section **20** that the printing job has been cancelled (step S**3**).

[0111] Upon receiving a notification of cancel of the print job from the job controller **13**, each part of the apparatus sets a job cancel state according to the job cancel instruction (step S**4**). To be specific, the spooler **111**, the RIP **14**, the image transfer module **15**, and the image forming section **20** each stop the job being executed.

[0112] Furthermore, when the acceptor **12** receives the job cancel instruction, the job monitor/identifier **112** transitions to the cancel state and monitors the print job that newly enters the spooler **111**.

[0113] Furthermore, in the present embodiment, the job monitor/identifier **112** after the transition to the cancel state confirms the state of a job newly entering the spooler **111**, and identifies (judges) whether or not the job is to be the cancel target.

[0114] During the continuation of the job cancel state, the job controller **13** further judges whether the acceptor **12** has accepted the release instruction for the job cancel state (step S**5**). That is, the job controller **13** judges whether or not it has been notified by the acceptor **12** that it has accepted the instruction to release the job cancel state (step S**5**).

[0115] When notified by the acceptor **12** that the instruction to release the job cancel state has been accepted (step S**5**; YES), the job controller **13** releases the cancel state of each part of the apparatus (step S**6**), and causes the job to be output as usual (step S**7**).

[0116] That is, in a case where the reception itself of the receiver **11** has been cancelled (in a case of a printing

[0117] terminate instruction), the reception of the job is resumed, and the received job is sent to the image forming section **20** via the RIP **14** and image transfer module **15**. In a case where the received job is on hold (in a case of a printing interruption instruction), the jobs accumulated in the spooler **111** are sequentially sent to the image forming section **20** via the RIP **14** and image transfer module **15**. Next, the image forming section **20** performs a printing operation in accordance with the print instruction.

[0118] On the other hand, when there is no notification from the acceptor **12** that a job cancel state release instruction has been accepted (step S**5**; NO), the job controller **13** further determines whether or not a job constituting the received print instruction is a job to be the cancel target (step S**8**).

[0119] Specifically, the job controller **13** acquires, from the job monitor/identifier **112** after transition to the cancel state, the identification result as to whether or not the job entering the spooler **111** is to be the cancel target. Next, the job controller **13** determines, among newly received print jobs, the print job judged to be the cancel target by the job monitor/identifier **112** as the print job to be the cancel target (step S**8**; YES), and cancels the job (step S**9**).

[0120] On the other hand, when the job constituting the received print instruction is not the job to be the cancel target (step S**8**; NO), the job controller **13** sends the job to the image forming section **20** from the spooler **111** sequentially via the RIP **14** and the image transfer module **15**. Next, in the image forming section **20**, outputting (printing operation) is performed according to the print instruction (step S**7**).

[0121] Furthermore, when there is no notification from the acceptor **12** that a job cancel instruction has been accepted (step S**2**; NO), the job controller **13** further judges whether or not each part of the apparatus is already in a job cancel state (job cancel is being continued) (step S**10**).

[0122] If it is the job cancel state (step S**10**; YES), the flow advances to step S**5** to execute the subsequent processing.

[0123] On the other hand, if it is not the job cancel state (step S**10**; NO), the job is sent from the spooler **111** to the RIP **14**, the image transfer module **15**, and the image forming section **20** as usual. Next, in the image forming section **20**, outputting (printing operation) is performed according to the print instruction (step S**7**).

[Effects]

[0124] As described above, the print control apparatus **10** according to the present embodiment includes the receiver

11, the acceptor 12, and the job controller 13. When a receiver 11 receives a plurality of small jobs transmitted from the client terminal on the basis of the print instruction, the controller 13 performs control so as to perform printing on the basis of the received small job. Furthermore, the job cancel instruction, which is the printing terminate instruction or the printing interruption instruction, is accepted by the acceptor 12. Then, when the job cancel instruction is accepted by the acceptor 12 during reception of the plurality of small jobs by the receiver 11, the controller 13 performs control to terminate or interrupt printing based on the small jobs.

[0125] Thus, the progress of the printing-related processing is stopped after the time point at which the job cancel instruction has been accepted. Therefore, the execution of not only the job currently being executed but also the small jobs continuously sent from the client terminal 5 can be promptly stopped.

[0126] Note that the job to be terminated or interrupted based on the job cancel instruction is, for example, the small job received when the job cancel instruction is accepted, or the small job to be printed next after the small job currently being printed.

[0127] Further, according to the present embodiment, when the acceptor 12 accepts the instruction to terminate printing, the job controller 13 stops printing of the job that is being printed. In addition, printing of the job newly received by the receiver 11 is also stopped. Then, after the time point at which the terminate instruction is accepted, the reception of the print instruction by the receiver 11 is also stopped.

[0128] In this way, by canceling the reception of the job itself, it is possible to reliably stop the progress of the process related to printing after the time point at which the acceptor 12 accepts the job cancel instruction.

[0129] Furthermore, according to the present embodiment, when the acceptor 12 accepts the printing interruption instruction, the job controller 13 stops printing of the job that is being printed. In addition, printing of the job newly received by the receiver 11 is also stopped. However, even after the time point at which the interruption instruction is accepted, the reception of the print instruction by the receiver 11 is continued.

[0130] Thus, the progress of printing-related processing is stopped after the time point at which the job cancel instruction has been accepted. On the other hand, when the job cancel state is released, the stopped printing operation of the job can be promptly resumed.

[0131] Furthermore, the acceptor 12 of the present embodiment is capable of accepting the job cancel instruction and the release instruction to release the job cancel instruction from the user. When the acceptor 12 receives the release instruction for releasing the job cancel instruction after accepting the job cancel instruction, the job controller 13 restarts the operation of each part which has been stopped at the timing of receiving the release instruction.

[0132] As a result, it is possible to easily cancel a job and release the cancel state by a user operation.

[0133] The print control apparatus 10 according to the embodiment includes a timer function. Next, the job controller 13 according to the present embodiment restarts the operation of each section that has been stopped at a timing when a predetermined time has elapsed after the acceptor 12 accepted the job cancel instruction.

[0134] Thus, when the predetermined time has elapsed, the printing operation of the job stopped by the job cancel instruction can be automatically resumed without the user's individual operation.

[0135] Furthermore, the print control apparatus 10 according to the present embodiment includes a count function of counting the number of jobs. Then, after the acceptor 12 accepts the job cancel instruction, the job controller 13 of the present embodiment restarts the operation of each unit that has been stopped at the timing when the number of jobs received by the receiver 11 reaches the set predetermined number of jobs.

[0136] Thus, when the job is received the predetermined number of times, the printing operation of the job stopped by the job cancel instruction can be automatically restarted without individual operation by the user.

[0137] The job monitor/identifier 112 of the receiver 11 in the embodiment can monitor the state of reception of data from the client terminal 5. Next, after accepting the job cancel instruction, the job controller 13 resumes the stopped operation of each part at the timing when the communication from the client terminal 5 to the receiver 11 is interrupted for a predetermined time or longer.

[0138] In a case where the communication from the client terminal 5 is interrupted, it is assumed that the user is switched or the type of job is changed. In such a case, it is possible to automatically release the job cancel state and resume the printing operation without the user's individual operation.

[0139] The job monitor/identifier 112 of the receiver 11 in the embodiment is also capable of analyzing the characteristics of the job data received from the client terminal 5. The job monitor/identifier 112 analyzes whether or not a feature of a job newly received by the receiver 11 is common to a feature of the job data received at the time when the acceptor 12 accepts the job cancel instruction. The job controller 13 determines the job having "a common feature" as the cancel target. Then, the operation of each unit related to printing is stopped for the job that is the cancel target.

[0140] The job data having a common feature is often a series of jobs. For this reason, the job cancel state is continued even if the job cancel instruction is not given again for those having a common feature. As a result, it is possible to reduce the burden of the user's operation. Furthermore, it is possible to cause a printing operation to be performed for a new job that is distinguished from the job for which the job cancel instruction has been accepted, and thus it is possible to smoothly control printing.

[0141] The acceptor 12 according to the present embodiment can accept an error signal from each unit of the apparatus as the job cancel instruction. When the acceptor 12 accepts the error signal from each part of the apparatus, the job controller 13 stops the operation of each part related to printing.

[0142] Thus, even when the user does not notice the abnormality or the cancel instruction is delayed, the job cancel state can be automatically and quickly set.

[0143] Furthermore, according to the present embodiment, it is possible to confirm, on the display parts 30 and 50, a history list of jobs that the job controller 13 has determined to be the cancel target.

[0144] Thus, the user can easily confirm, on the display parts 30 and 50, which of the jobs instructed to be printed has been canceled.

Second Embodiment

[0145] Next, a second embodiment of the print control apparatus, the print control system, and the storage medium according to the present embodiment will be described. Note that the handling of the job to be the cancel target in the present embodiment is different from that in the first embodiment. The apparatus configuration is the same as that described in the first embodiment, and thus the description thereof will be omitted. In the following, differences from the first embodiment in particular will be described.

[0146] FIG. **12** is a flowchart illustrating print control in the present embodiment, in particular, a flow of cancel of a print job and release of a job cancel state. Note that since step S**21** and step S**22** illustrated in FIG. **12** are the same as step S**1** and step S**2** illustrated in FIG. **11**, description thereof will be omitted.

[0147] As shown in FIG. **12**, when the acceptance of the job cancel instruction is notified from the acceptor **12** (step S**22**; YES), the job controller **13** sets a cancel flag in each unit of the apparatus such as the spooler **111** and the job monitor/identifier **112** which are the receiver **11**, the RIP **14**, the image transfer module **15**, and the image forming section **20** (cancel flag ON; step S**23**). That is, similarly to step S**3** in FIG. **11**, the job controller **13** notifies each part of the apparatus that the print job has been cancelled.

[0148] When the cancel flag is turned on, each unit of the apparatus sets the job cancel state in accordance with the job cancel instruction (step S**24**). To be specific, the spooler **111**, the RIP **14**, the image transfer module **15**, and the image forming section **20** each stop the job being executed.

[0149] Furthermore, when the acceptor **12** receives the job cancel instruction, the job monitor/identifier **112** transitions to the cancel state and monitors the print job that newly enters the spooler **111**.

[0150] Furthermore, in the present embodiment, the job monitor/identifier **112** after transitioning to the cancel state analyzes the characteristics of the job newly entering the spooler **111**, and identifies (judges) whether or not the job is to be the cancel target.

[0151] While the job cancel state continues, the job controller **13** judges, in a similar manner to step S**5** in FIG. **11**, whether the acceptor **12** has accepted the instruction to release the job cancel state (step S**25**). Next, when notified by the acceptor **12** that the instruction to release the job cancel state has been accepted (step S**25**; YES), the job controller **13** turns off the cancel flag to release the cancel state of each part of the apparatus (step S**26**), and causes the job to be output as usual (step S**27**).

[0152] On the other hand, when there is no notification from the acceptor **12** that the instruction to release the job cancel state has been accepted (step S**25**; NO), the job controller **13** further determines whether or not the job constituting the print instruction newly received by the receiver **11** is the job to be the cancel target (step S**28**).

[0153] Specifically, the job controller **13** acquires, from the job monitor/identifier **112** after transition to the cancel state, the identification result as to whether or not the job that enters the spooler **111** is to be the cancel target. Next, the job controller **13** determines that, among newly received print jobs, the print job judged by the job monitor/identifier **112** not to be the cancel target is not to be the cancel target (step S**28**; NO), and causes the job to be output as usual (step S**27**).

[0154] On the other hand, among the newly received print jobs, the print job judged to be the cancel target by the job monitor/identifier **112** is determined to be the cancel target by the job controller **13** (step S**28**; YES), and is displayed on job cancel candidate list screens **319** and **519** of the display parts **30** and **50** (step S**29**).

[0155] FIG. **13** is a diagram illustrating an example of the job cancel candidate list screen displayed on the display part. According to the present embodiment, processing of the job determined to be the cancel target by the job controller **13** is suspended, and the job is accumulated in the spooler **111** or the like of the receiver **11**. The job controller **13** causes the operation screens **31**, **51** of the display parts **30**, **50** to display the job cancel candidate list screen **319**, **519** as illustrated in FIG. **13**, so that the user can confirm the job determined to be the cancel target.

[0156] For example, FIG. **13** illustrates a case where five print jobs with the file names **01** to **05** are to be the cancel target. As illustrated in FIG. **13**, for each job, the number of pages, the reason why the job has been identified as the job to be the cancel target by the job monitor/identifier **112** (identifying means), and the like are displayed.

[0157] On the job cancel candidate list screens **319** and **519**, a "cancel button" **98**, a "print button" **99**, a "return button" **91**, and the like are displayed.

[0158] The job controller **13** judges whether the "cancel button" **98** in the job cancel candidate list screen **319**, **519** has been pressed (step S**30**). If the "cancel button" **98** is pressed by the user (step S**30**; YES), the job controller **13** collectively cancels the jobs that are the candidates for cancel (step S**31**).

[0159] In this case, all of the cancel candidate jobs on the list may be cancelled, but in the present embodiment, the user can select the job for which cancel is to be fixed from among the cancel target jobs. In the example illustrated in FIG. **13**, a file name **01** and a file name **03** are selected in the job cancel candidate list screens **319**, **519**. When the "cancel button" is pressed in this state, the cancel of the two jobs can be collectively fixed. The color or the like of the letters or the background of the job fixed to be cancelled may change, or the job may disappear from the list display of the job cancel candidate list screens **319**, **519**.

[0160] Note that the job cancel candidate list screens **319** and **519** shown in FIG. **13** are examples, and the screen configuration, the types of buttons, the arrangement, and the like can be changed as appropriate. For example, in addition to the buttons illustrated in FIG. **13**, the job cancel candidate list screens **319** and **519** may be provided with a "collectively select button", a "collectively release button", and the like. In this case, it is possible to save the user the trouble of selecting jobs one by one. In a case where the number of jobs to be the cancel target is large or the like, the selection or the like can be collectively performed, so that the operation can be facilitated. It is preferable that the job for which cancel is fixed can be confirmed as the history.

[0161] For example, FIG. **14** is a diagram illustrating an example of cancel job history screens **320**, **520** displayed on the display parts **30**, **50**.

[0162] FIG. **14** illustrates a case where all the jobs displayed on the job cancel candidate list screens **319** and **519** in FIG. **13** have been cancelled. In this way, since it is possible to confirm for which job the cancel has been fixed, the user can confirm the cancel state of the job. Thus, when there is a job that has been cancelled by mistake, it is

possible to quickly confirm the job. Note that the cancel job history screens **320**, **520** shown in FIG. **14** are examples, and the screen configuration, the types of buttons, the arrangement, and the like can be changed as appropriate.

[0163] If the "cancel button" **98** has not been pressed on the job cancel candidate list screen **319**, **519** (step S**30**; NO), the job controller **13** further judges whether or not the "print button" **99** has been pressed on the job cancel candidate list screen **319**, **519** (step S**32**). If the "print button" **99** has been pressed by the user (step S**32**; YES), the job controller **13** collectively outputs (prints in the image forming section **20**) the jobs that are candidates for cancel (step S**33**).

[0164] Note that also in this case, all the cancel candidate jobs on the list may be output (printed), or only the jobs selected by the user among the cancel target jobs may be collectively output (printed). The output (printed) job is preferably deleted from the list display of the job cancel candidate list screen.

[0165] If the "print button" **99** has not been pressed (step S**32**; NO), the job controller **13** further judges whether the "return button" **91** has been pressed in the job cancel candidate list screen **319**, **519** (step S**34**). If the "return button" **91** has been pressed by the user (step S**34**; YES), the job controller **13** returns to step S**30** and repeats the subsequent processing.

[0166] On the other hand, if the "return button" **91** is not pressed (step S**34**; NO), the job controller **13** sets the jobs displayed as a list on the job cancel candidate list screens **319**, **519** to a temporary storage state (that is, continuation of the hold state), and ends the process.

[0167] According to the present embodiment, the job controller **13** suspends the processing of the job determined to be the cancel target, and allows the display part **30**, **50** to display the job to be the cancel target. Next, the input as to whether or not to fix the cancel of the job to be the cancel target displayed on the display parts **30**, **50** is accepted.

[0168] As a result, the user can easily confirm which job is to be the cancel target. In addition, since whether to actually fix the cancel is also left to the user's judgement, the user can finally determine the handling of the job to be the cancel target, thus preventing the job from being unintentionally cancelled.

Third Embodiment

[0169] Next, a third embodiment of the print control apparatus, the print control system, and the storage medium according to the present embodiment will be described. Note that in the present embodiment, the system configuration of the print control system is different from that of the first embodiment and the like. In particular, differences from the first embodiment and the like will be described below.

[0170] FIG. **15** is a diagram illustrating a schematic configuration of a print control system in the second embodiment.

[0171] As shown in FIG. **15**, the print control system **200** of the present embodiment includes a client terminal **5**, a print control apparatus **6** (hardware processor), and an image forming apparatus **7**.

[0172] The print control apparatus **6** is a controller that controls an operation (printing operation) and the like by the image forming apparatus **7**. The print control apparatus **6** is configured as an apparatus separate from the image forming apparatus **7**, and is a computer including a CPU, a ROM, a RAM, and the like (not shown). The print control apparatus **6** is the same as the print control apparatus **10** (see FIG. **1**) described in the first embodiment and the like, except that the print control apparatus **6** is separate from the image forming apparatus **7**. Therefore, the components of the print control apparatus **6** similar to those of the print control apparatus **10** are denoted by the same names and reference numerals as those shown in FIG. **1**, and the description thereof will be omitted.

[0173] The image forming apparatus **7** includes an acceptor **71** and accepts print data and the like from an external device. Furthermore, the image forming apparatus **7** includes a display part **72** for displaying an operation screen. The display part may be provided in the print control apparatus **6**. In addition, a display part may be provided in each of the client terminal **5**, the print control apparatus **6**, and the image forming apparatus **7**.

[0174] In the embodiment, various signals are transmitted and received between the print control apparatus **6** and the image forming apparatus **7** via, for example, Video IF.

[0175] For example, a print instruction is sent from the print control apparatus **6** side to the image forming apparatus **7**. When the acceptor **12** of the print control apparatus **6** accepts a job cancel instruction, a notification indicating that the print job has been cancelled is sent to the image forming apparatus **7**. From the image forming apparatus **7** side, for example, when some trouble occurs and the printing operation cannot be continued, the job cancel instruction (cancel request) for requesting to cancel the job is sent to the print control apparatus **6**.

[0176] As shown in FIG. **15**, even when the print control apparatus **6** and the image forming apparatus **7** are configured as separate apparatuses, the operation of each unit of the print control apparatus **6** is the same as that of the print control apparatus **10** described in the first embodiment and the like.

[0177] That is, when a plurality of small jobs are sent from the client terminal **5**, the print control apparatus **6** receives the small jobs (print jobs) in the receiver **11**. The print control apparatus **6** converts the print job received from the client terminal **5** into data printable by the image forming apparatus **7**, and outputs the data to the image forming apparatus **7**. Thus, the image forming apparatus **7** performs printing operation in accordance with the print instruction.

[0178] Furthermore, when a job cancel instruction is input from the operation screen **51** or the like of the display part **50**, **72** or the like and is accepted by the acceptor **12**, a notification that the print job has been cancelled is sent from the job controller **13** to the image forming apparatus **7**. In this case, in the image forming apparatus **7**, the job currently being executed is cancelled until a release instruction of the job cancel instruction is further transmitted.

[0179] In addition, all jobs which have been received from the client terminal **5** and remain in each unit (for example, RIP **14** or the like) in the print control apparatus **6** are also cancelled (processing is stopped). Furthermore, a job that has been newly sent to the print control apparatus **6** is also cancelled (reception is stopped) or put on hold, so that the job is not output to the image forming apparatus **7**.

[0180] Accordingly, even in a case where the print control apparatus **6** and the image forming apparatus **7** are separate bodies, after the job cancel instruction is accepted, the output (printing) of the job is all cancelled until the cancel

state is released. Therefore, it is possible to reliably prevent printing from being continued even after the job cancel instruction is accepted.

Modification Example

[0181] Note that the present invention is not limited to the above-described embodiment, and it is needless to say that appropriate changes can be made without departing from the spirit of the present invention.

[0182] For example, in the above-described embodiment, only the print job that the job monitor/identifier **112** identifies as the job to be the cancel target among print jobs that newly enter the receiver **11** during execution (continuation) of job cancel is to be cancelled. However, for example, during execution (continuation) of job cancel, printing of all received jobs and reception of all new jobs input to the receiver **11** may be stopped (cancelled).

[0183] Furthermore, although the acceptor **12** accepts a notification requesting job cancel from each part of the apparatus when some trouble occurs in each part of the apparatus, the present invention is not limited to the case where the acceptor **12** accepts a notification from each part of the apparatus. For example, the job controller **13** may accept a notification from each part of the apparatus and notify of job cancel to each part of the apparatus continuing to operate.

[0184] In addition, the configurations and operations of the print control apparatus **10** and the print control system **100** including the print control apparatus **10** can be appropriately changed without departing from the scope of the present invention.

[0185] Although embodiments of the present invention have been described and shown in detail, the disclosed embodiments are made for purposes of illustration and example only and not limitation. The scope of the present invention should be interpreted by terms of the appended claims.

What is claimed is:

1. A print control apparatus comprising:

a hardware processor,

wherein the hardware processor,

receives a plurality of small jobs transmitted from a client terminal based on a print instruction,

performs control to perform printing based on the received small jobs,

accepts a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction, and

when the job cancel instruction is accepted during reception of the plurality of small jobs, performs control such that the printing based on the small jobs is terminated or interrupted.

2. The print control apparatus according to claim **1**, wherein a job to be terminated or interrupted based on the job cancel instruction is a small job that has been received when the job cancel instruction has been accepted, or a small job to be printed next after the small job currently being printed.

3. The print control apparatus according to claim **1**, wherein reception of a small job is stopped after accepting the job cancel instruction.

4. The print control apparatus according to claim **1**, wherein even after the job cancel instruction is accepted, reception of the small job continues.

5. The print control apparatus according to claim **1**, wherein the hardware processor, when the printing terminate instruction is accepted, stops the printing of the job under printing execution, stops the printing of the job to be newly received, and stops the reception of the print instruction after the point of time when the printing terminate instruction is accepted.

6. The print control apparatus according to claim **1**, wherein the hardware processor, when the printing interrupt instruction is accepted, stops the printing of the job under printing execution, and stops the printing of the job to be newly received, but continues the reception of the print instruction after the point of time when the printing interrupt instruction is accepted.

7. The print control apparatus according to claim **1**,

wherein the hardware processor,

is configured to be capable of accepting the job cancel instruction and a release instruction to release the job cancel instruction from a user, and

after accepting the job cancel instruction from the user, resumes, when the release instruction to release the job cancel instruction is accepted, an operation of each section that has been stopped according to the job cancel instruction, at a timing when the release instruction is accepted.

8. The print control apparatus according to claim **1**,

wherein the hardware processor,

keeps time, and

resumes, at a timing when a predetermined time has elapsed after accepting the job cancel instruction, operation of each section that has been stopped according to the job cancel instruction.

9. The print control apparatus according to claim **1**,

wherein the hardware processor,

counts the number of jobs, and

after accepting the job cancel instruction, restarts the operation of each section stopped according to the job cancel instruction at a timing when the number of received jobs reaches a set predetermined number of jobs.

10. The print control apparatus according to claim **1**,

wherein the hardware processor,

is configured to be capable of monitoring a reception state of data from the client terminal, and

after accepting the job cancel instruction, restarts, at a timing when communication from a client terminal is interrupted for a predetermined time or more, operation of each section that has been stopped according to the job cancel instruction.

11. The print control apparatus according to claim **1**, wherein,

the hardware processor is configured to be capable of analyzing a feature of job data received from a client terminal, and

among newly received jobs, a job analyzed to have a common feature with the job data received at a point of time when the job cancel instruction is accepted is determined by the hardware processor as the job to be the cancel target, and the hardware processor stops the operation of each section related to printing for the job that is the cancel target.

12. The print control apparatus according to claim **1**,
wherein the hardware processor,
is configured to be capable of accepting an error signal from each section of the apparatus as the job cancel instruction, and
stops operation of each section related to printing when the error signal is accepted from each section of the apparatus.

13. The print control apparatus according to claim **11**,
further comprising a display part,
wherein,
processing of the job determined by the hardware processor to be the job to be the cancel target is suspended,
the display part displays the job determined to be the cancel target in a manner that the job can be confirmed, and
the hardware processor accepts an input as to whether to fix cancel of the job that is the cancel target displayed on the display part.

14. The print control apparatus according to claim **11**,
further comprising a display part,
wherein the display part displays a list of history of the job determined to be the cancel target by the hardware processor in such a manner that the list can be confirmed.

15. A print control system, comprising:
a hardware processor, wherein the hardware processor,
receives a plurality of small jobs transmitted from a client terminal based on a print instruction,
performs control to perform printing based on the received small jobs, and
accepts a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction;
a print control apparatus;
a client terminal that transmits a plurality of small jobs based on the print instruction; and
an image forming apparatus that executes a printing operation for the small job,
wherein,
the hardware processor performs control so as to terminate or interrupt printing based on the small job when the job cancel instruction is accepted during reception of the plurality of small jobs.

16. A non-transitory computer-readable storage medium storing a program causing a computer that controls a printing operation to execute,
receiving a plurality of small jobs transmitted from a client terminal based on a print instruction,
performing control to perform printing based on the received small job;
accepting a job cancel instruction that is a printing terminate instruction or a printing interrupt instruction, and
when the job cancel instruction is accepted during reception of the plurality of small jobs, performing control such that the printing based on the small jobs is terminated or interrupted.

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