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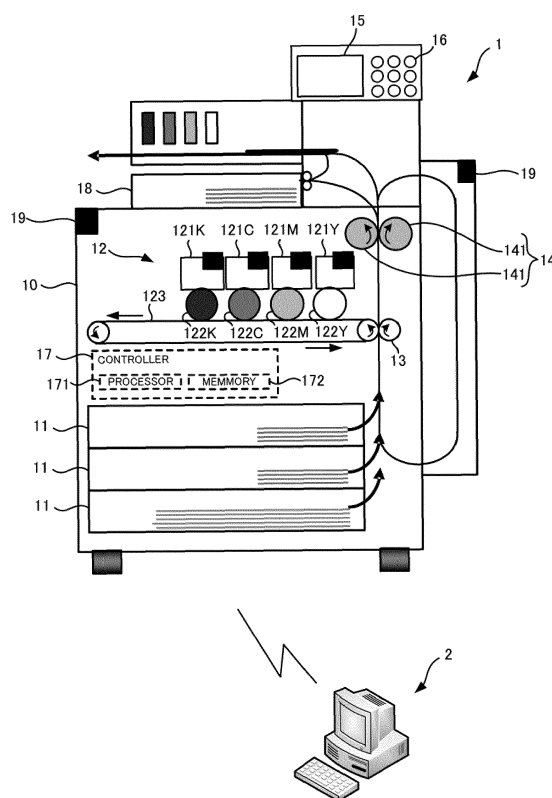
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(54) **IMAGE FORMING APPARATUS WITH HUMAN SENSOR THAT DEALS WITH ABNORMAL WARMING-UP PROCESS, WARMING-UP PROCESS METHOD, AND RECORDING MEDIUM**

(57) According to an embodiment, an image forming apparatus includes a human sensor and a controller. The human sensor detects a human. The controller performs a predetermined process when a warming-up process for increasing a temperature of a fixing device is started in a state where the human sensor does not detect the human.

FIG. 1



Description

FIELD

[0001] Embodiments described herein relate generally to a technique of a warming-up process in an image forming apparatus.

BACKGROUND

[0002] In the related art, an image forming apparatus is known in which a warming-up process is performed when a human sensor detects a human or when a power supply is turned on.

[0003] The image forming apparatus of the related art has a problem in that the warming-up process is performed many times when the power supply is repeatedly turned on and off due to abnormalities in the power supply.

DESCRIPTION OF THE DRAWINGS

[0004]

FIG. 1 is a view illustrating an image forming apparatus.

FIG. 2 is a flow chart for describing a warming-up process method.

FIG. 3 is a view illustrating a warning display for warning indicating a generation of an abnormal warming-up process.

DETAILED DESCRIPTION

[0005] In general, according to one embodiment, an image forming apparatus includes a human sensor and a controller. The human sensor detects a human. The controller performs a predetermined process when a warming-up process for increasing a temperature of a fixing device is started in a state where the human sensor does not detect the human.

[0006] Preferably, the controller counts up a counter when new warming-up process is started before the warming-up process is terminated, and performs the predetermined process when the counter reaches a threshold.

[0007] Preferably, the predetermined process is a process for inhibiting the warming-up process.

[0008] Preferably, the apparatus further comprises: a notifying unit that notifies a user of a generation of abnormalities in the warming-up process.

[0009] Preferably, the notifying unit is a display.

[0010] Preferably, the predetermined process is a process for informing an external apparatus of generation of the abnormalities in the warming-up process.

[0011] Preferably, the predetermined process is a process in which a power supply is turned off.

[0012] Further, according to another embodiment, a

warming-up process method of an image forming apparatus includes performing a predetermined process, when a warming-up process for increasing a temperature of a fixing device is started in a state where a human sensor does not detect a human.

[0013] Preferably, the method further comprises counting up a counter when the warming-up process is newly started before the warming-up process is terminated in the state where the human sensor does not detect a human; and performing the predetermined process when the counter reaches a predetermined number.

[0014] Preferably, the predetermined process is a process for inhibiting the warming-up process when the counter reaches a predetermined number.

[0015] Preferably, the method further comprises notifying a user of a generation of abnormalities in the warming-up process.

[0016] Preferably, the predetermined process is a process for informing an external apparatus of generation of the abnormalities in the warming-up process.

[0017] Preferably, the predetermined process is a process for turning off a power supply.

[0018] Further, according to still another embodiment, a recording medium non-temporally stores a program that causes an image forming apparatus to perform a predetermined process when a warming-up process for increasing a temperature of a fixing device is started in a state where a human sensor does not detect a human.

[0019] Hereinafter, the embodiments will be described with reference to the drawings.

[0020] FIG. 1 is a view illustrating an image forming apparatus 1.

[0021] The image forming apparatus 1 is a multi-function peripheral (MFP) having a plurality of functions such as faxing, printing, and scanning.

[0022] The image forming apparatus 1 pulls a sheet from the inside of a cassette 11, and feeds the sheet to an image forming unit 12. In the image forming unit 12, developing units 121Y to 121K supply toners having various colors to photoreceptors 122Y to 122K, and toner images having various colors are formed on the photoreceptors 122Y to 122K. The photoreceptors 122Y to 122K transfer the toner images having various colors to a transfer belt 123 so that the toner images overlap with each other, and form one toner image having multiple colors on the transfer belt 123. The transfer belt 123 faces and is come into contact with transfer rollers 13. The transfer belt 123 transfers the toner image onto the sheet which passes through between the transfer belt 123 and the transfer rollers 13.

[0023] The image forming apparatus 1 feeds the sheet to a fixing device 14. The fixing device 14 includes a pair of fixing rollers 141. The pair of fixing rollers 141 may be respectively heated by a heater (not illustrated), and the temperature of each fixing roller may be controlled. When performing an image forming process, the image forming apparatus 1 increases the temperature of the pair of fixing rollers 141. The pair of fixing rollers 141 heats and pres-

surizes the sheet which passes through between the pair of fixing rollers 141, and fixes the toner image on the sheet.

[0024] The image forming apparatus 1 feeds the sheet to an after-treatment apparatus (not illustrated), or discharges the sheet to a cassette 18.

[0025] The image forming apparatus 1 includes a touch panel 15 (notifying unit) and an operation unit 16. The touch panel 15 displays setting information, an operation status, log information, or a notification to a user of the image forming apparatus 1. The operation unit 16 is a button or a key. The touch panel 15 and the operation unit 16 receive an instruction of a function operation of the image forming apparatus 1 such as a printing instruction by receiving an input of the user.

[0026] The image forming apparatus 1 may communicate with an external apparatus 2.

[0027] The image forming apparatus 1 includes a controller 17 which overall controls the image forming apparatus 1. The controller 17 includes a processor 171 and a memory 172. The controller 17 performs each process by reading programs in the memory 172 using the processor 171.

[0028] The controller 17 performs a warming-up process when a power supply of the image forming apparatus 1 is turned on from off or when a cover 10 is closed from being opened. The warming-up process means a printing prepare process such as increasing the temperature of the fixing device 14. The warming-up process is terminated when the temperature of the fixing device 14 reaches a target temperature, or the like.

[0029] The image forming apparatus 1 includes a human sensor 19 which detects a human near the image forming apparatus 1. The human sensor 19 receives, for example, infrared rays, and detects whether or not the human exists near the image forming apparatus 1 based on a change in a received amount of the infrared rays radiated from the human. The controller 17 performs the warming-up process when the human sensor 19 detects the human.

[0030] Hereinafter, a flow of a warming-up process method performed by the controller 17 will be described with reference to a flow chart in FIG. 2.

[0031] First, a flow of the warming-up process method when the power supply of the image forming apparatus 1 is turned on from off will be described.

[0032] When the power supply is turned on from off or when a cover of the image forming apparatus 1 is closed from being opened (Act 1: YES), if the human sensor 19 does not detect the human (Act 2: NO), the controller 17 sets a flag of the warming-up process (Act 3).

[0033] The controller 17 counts up the number of times of continuous performing of the warming-up process, and then, for example, changes a counter from 0 to 1 (Act 4). Moreover, the memory 172 stores each flag and counter.

[0034] When the previous warming-up process is terminated (Act 5: YES), the controller 17 restores the counter to 0 (Act 6). The controller 17 starts the warming-up

process, and increases the temperature of the fixing device 14 (Act 7). The controller 17 clears the flag of the warming-up process (Act 8). The warming-up process method returns to Act 1.

[0035] Hereinafter, a flow of the warming-up process method when the power supply fails and is repeatedly turned on and off will be described.

[0036] When the previous warming-up process is not terminated with the flag of the warming-up process set (Act 5: NO), the controller 17 determines whether or not a value of the counter reaches a threshold (Act 9).

[0037] The controller 17 starts the warming-up process (Act 7) when the value of counter does not reach the threshold (Act 9: NO).

[0038] When the power supply fails and is repeatedly turned on and off, the controller 17 continuously performs starting new warming-up process before the warming-up process is terminated until the number of times of performing the warming-up process reaches a specific number (Act 1: YES, Act 2: NO, Act 3, Act 4, Act 5: NO, Act 9: NO, Act 7: NO, and Act 8).

[0039] When the warming-up process is continuously performed a specific number of times, that is, when the value of counter reaches the threshold (Act 9: YES), the controller 17 sets a warning flag (Act 10).

[0040] The controller 17 clears the flag of the warming-up process (Act 11) and inhibits the warming-up process by turning off the power supply (Act 12). The warming-up process method returns to Act 1.

[0041] Hereinafter, a flow of the warming-up process method when the human sensor 19 detects the user in a normal mode in which the power supply fails will be described.

[0042] When a job is not requested to be performed for a certain period of time with the power supply turned on, the controller 17 enters a sleep mode. In the sleep mode, the controller 17 decreases the temperature of the fixing device 14 and decreases a consumption of power than the normal mode.

[0043] When the human sensor 19 detects the human in the sleep mode (Act 1: NO, Act 13: YES), the controller 17 sets the flag of the warming-up process (Act 14). In addition, when the power supply is turned on from off (Act 1: YES) and the human sensor 19 detects the human (Act 2: YES), the controller 17 also sets the flag of the warming-up process (Act 14).

[0044] The controller 17 determines whether or not the warning flag is set (Act 15). When the power supply does not fail, the warning flag is not set (Act 15: NO).

[0045] The controller 17 starts the warming-up process (Act 16), and restores the normal mode from the sleep mode. The controller 17 clears the flag of the warming-up process (Act 17).

[0046] The controller 17 does not perform the warming-up process when the human is detected in the normal mode or when the human sensor 19 does not detect the human in the sleep mode (Act 13: NO). In this case, the warming-up process method returns to Act 1.

[0047] Hereinafter, a flow of the warming-up process method when the user turns on the power supply of the image forming apparatus 1 after the warning flag is set will be described.

[0048] When the user turns on the power supply after the warning flag is set (Act 1: YES), the human sensor 19 detects the human (Act 2: YES).

[0049] The controller 17 sets the flag of the warming-up process (Act 14).

[0050] When determining that the warning flag is set (Act 15: YES), the controller 17 informs the user of a generation of abnormal warming-up process through the touch panel 15 (Act 18). As illustrated in FIG. 3, the controller 17 displays, for example, "Abnormalities are detected at the time of the previous warming-up process. Please check whether the abnormalities are generated in the machine" on the touch panel 15. Accordingly, the user is promoted to examine whether or not the abnormalities are generated in the image forming apparatus 1.

[0051] The controller 17 clears the warning flag (Act 19) and starts the warming-up process (Act 16).

[0052] When the warming-up process is terminated in a case in which the counter has a value (Act 20: YES), the controller 17 clears the counter (Act 21). The controller 17 does not clear the counter in a case in which the counter has not the value, or when the warming-up process is not terminated in a case in which the counter has the value. In this case, or after Act 21, the warming-up process method returns to Act 1.

[0053] According to the embodiment, it is possible to inhibit the warming-up process being continuously performed when the power supply fails and is repeatedly turned on and off, and to inform the user of the generation of the abnormal warming-up process.

[0054] The controller 17 may inform the user of the generation of the abnormalities in the warming-up process without the power supply turned off when the flag of a start of the warming-up process is set (Act 3) in a state in which the human sensor 19 does not detect the human (Act 2: NO).

[0055] The notifying unit may be a lamp or a speaker. The controller 17 may inform the user of the generation of the abnormalities in the warming-up process by blinking the lamp or outputting sound through the speaker.

[0056] The controller 17 may inform the external apparatus 2 of the generation of the abnormalities in the warming-up process.

[0057] As described above, according to the technique disclosed in this specification, the technique of the warming-up process in the image forming apparatus may be provided.

[0058] While certain embodiments have been described, these embodiments have been presented by way of example only, and are not intended to limit the scope of invention. Indeed, the novel apparatus, methods and system described herein may be embodied in a variety of other forms; furthermore, various omissions, substitutions and changes in the form of the apparatus, meth-

ods and system described herein may be made without departing from the spirit of the inventions. The accompanying claims and their equivalents are intended to cover such forms or modifications as would fall within the scope and spirit of the inventions.

Claims

1. An image forming apparatus comprising:

a human sensor that detects a human; and
a controller that performs a predetermined process when a warming-up process for increasing a temperature of a fixing device is started in a state where the human sensor does not detect the human.

2. The apparatus according to claim 1, wherein the controller counts up a counter when new warming-up process is started before the warming-up process is terminated, and performs the predetermined process when the counter reaches a threshold.

3. The apparatus according to claim 1 or 2, wherein the predetermined process is a process for inhibiting the warming-up process.

4. The apparatus according to claim 3, further comprising:

a notifying unit that notifies a user of a generation of abnormalities in the warming-up process.

5. The apparatus according to claim 4, wherein the notifying unit is a display.

6. The apparatus according to any one of claims 1 to 5, wherein the predetermined process is a process for informing an external apparatus of generation of the abnormalities in the warming-up process.

7. The apparatus according to any one of claims 3 to 6, wherein the predetermined process is a process in which a power supply is turned off.

8. A warming-up process method of an image forming apparatus, comprising:

performing a predetermined process when a warming-up process for increasing a temperature of a fixing device is started in a state where a human sensor does not detect a human.

9. The method according to claim 8, further comprising counting up a counter when the warming-up process is newly started before the warming-up process is

terminated in the state where the human sensor does not detect a human; and performing the predetermined process when the counter reaches a predetermined number.

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10. The method according to claim 8 or 9, wherein the predetermined process is a process for inhibiting the warming-up process when the counter reaches a predetermined number.

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11. The method according to any one of claims 8 to 10, further comprising notifying a user of a generation of abnormalities in the warming-up process.

12. The method according to any one of claims 8 to 11, wherein the predetermined process is a process for informing an external apparatus of generation of the abnormalities in the warming-up process.

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13. The method according to any one of claims 8 to 12, wherein the predetermined process is a process for turning off a power supply.

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14. A recording medium that non-temporally stores a program that causes an image forming apparatus to perform a predetermined process according to any one of claims 8 to 13, when a warming-up process for increasing a temperature of a fixing device is started in a state where a human sensor does not detect a human.

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FIG. 1

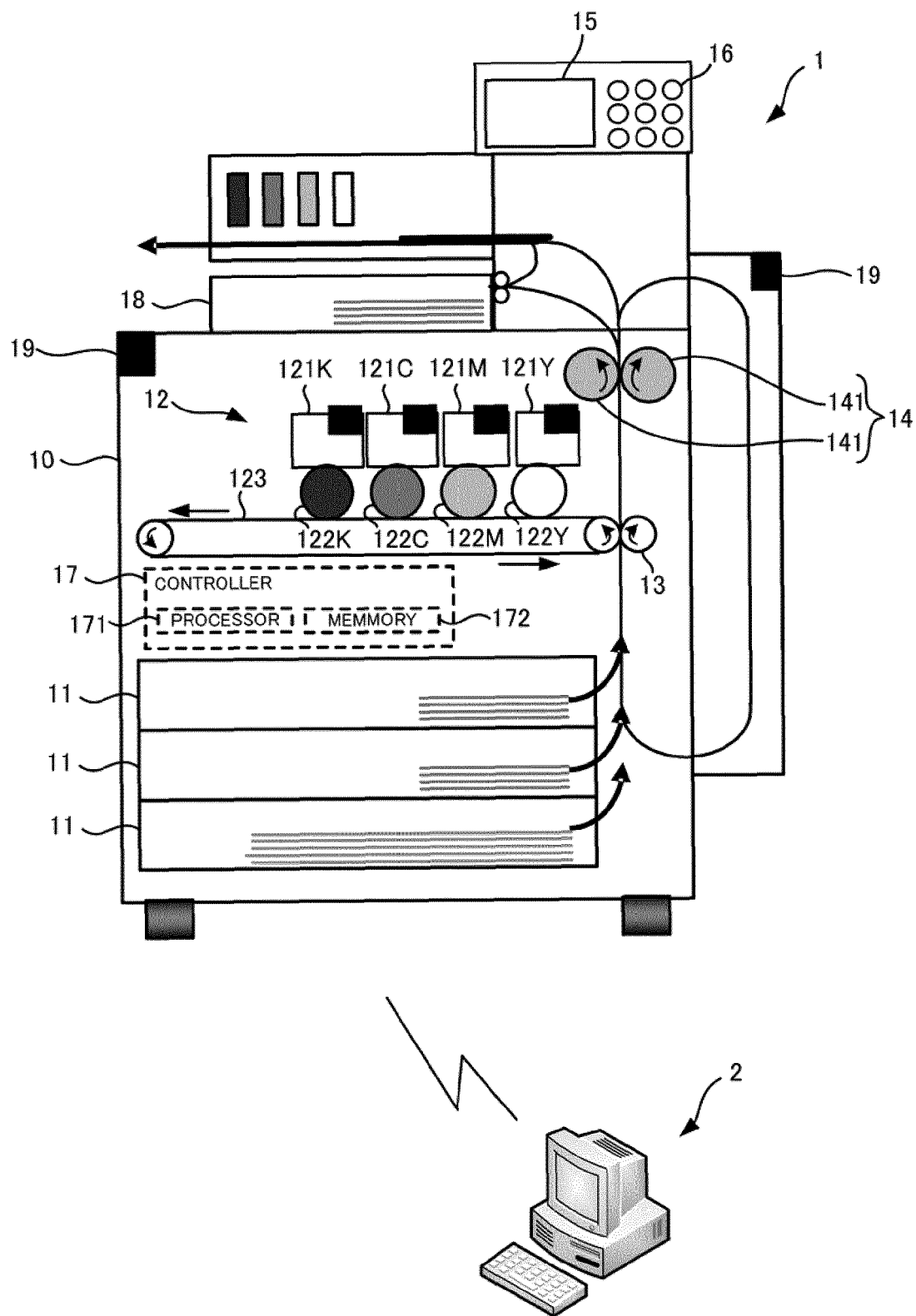


FIG. 2

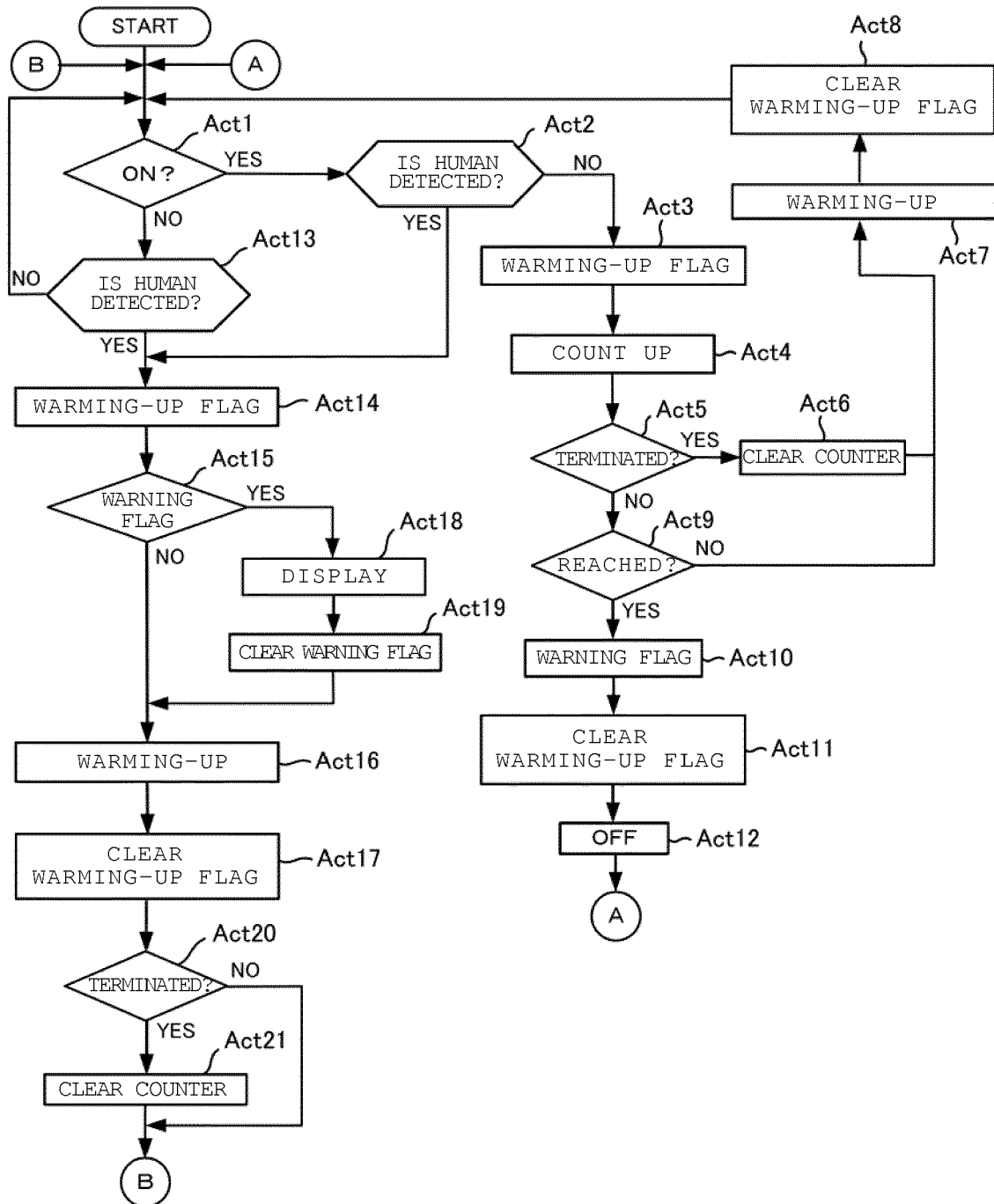
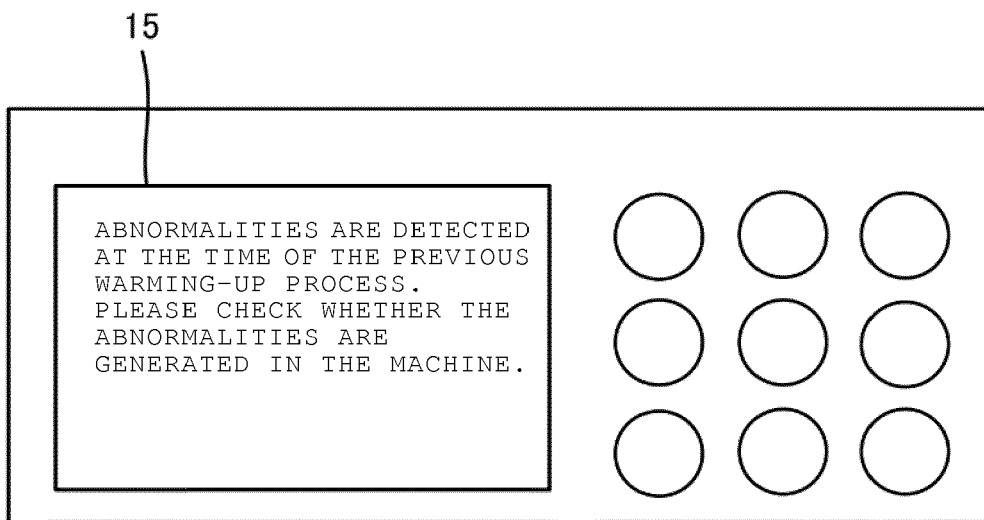


FIG. 3





EUROPEAN SEARCH REPORT

Application Number
EP 15 17 6008

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Place of search Munich		Date of completion of the search 29 January 2016	Examiner Kys, Walter
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**ANNEX TO THE EUROPEAN SEARCH REPORT
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