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(54) CONTROL METHOD OF DISHWASHER, DISHWASHER, AND COMPUTER-READABLE STORAGE MEDIUM

(57) A control method of a dishwasher (100). The dishwasher (100) comprises a housing (110), a temperature sensor unit (120), a heating device (130) and a first fan (140). The housing (110) is formed with a working cavity. The control method comprises the following steps: upon completion of washing of a dishwasher (100), controlling a temperature sensor unit (120) to measure the temperature; determining whether the temperature is less than or equal to a first preset temperature; and if the temperature is less than or equal to the first preset temperature, controlling a heating device (130) and a first fan (140) to operate to produce an air flow in a working cavity to dissipate the heat generated by the heating device (130). Also provided is a dishwasher.

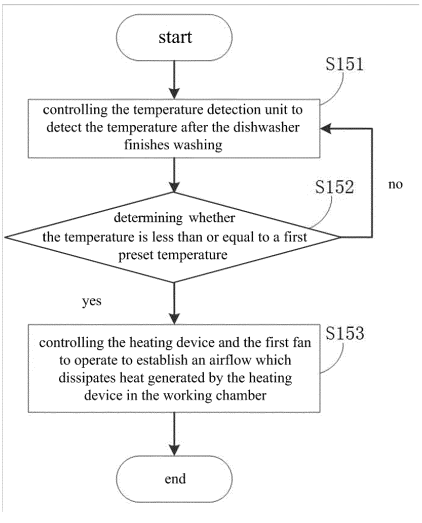

Fig. 1

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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application claims priority to and the benefit of patent application with the application number 201710776080.3, filed to China National Intellectual Property Administration on August 31, 2017, which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present invention relates to an electric home appliance, and more particularly, to a control method of a dishwasher, a dishwasher, and a computer-readable storage medium.

BACKGROUND

[0003] If tableware such as bowls and dishes is still placed in the dishwasher after the washing is finished, problems such as condensation of water vapor, growth of bacteria and the like may occur due to temperature drop in the dishwasher.

SUMMARY

[0004] The embodiment of the invention provides a control method of a dishwasher, a dishwasher and a computer-readable storage medium.

[0005] The embodiment of the invention provides a control method of a dishwasher, in which the dishwasher comprises a housing, a temperature detection unit, a heating device and a first fan, wherein a working chamber is formed in the housing, and the temperature detection unit is configured for detecting a temperature of the working chamber, while the heating device and the first fan are disposed in the working chamber, the control method comprising the following steps:

controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing;
determining whether the temperature is less than or equal to a first preset temperature; and
when the temperature is less than or equal to the first preset temperature, controlling the heating device and the first fan to operate so as to establish an airflow which dissipates heat generated by the heating device in the working chamber.

[0006] In certain embodiments, the control method comprises the following step before the dishwasher finishes washing:

controlling the dishwasher to enter a washing process, a rinsing process and a drying process.
In certain embodiments, the first preset temperature is 25 °C to 35 °C.

[0007] In certain embodiments, the control method comprises the steps of:

determining whether the temperature is greater than or equal to a second preset temperature, wherein the second preset temperature is greater than the first preset temperature; and
stopping the heating device and the first fan when the temperature is greater than or equal to the second preset temperature.

[0008] In certain embodiments, the second preset temperature is 45 °C to 50 °C.

[0009] In certain embodiments, the housing is provided with an air duct communicating outside and the working chamber, and the dishwasher includes a second fan provided in the air duct; the control method comprising the following step:
controlling the second fan to operate when the first fan operates.

[0010] A dishwasher according to an embodiment of the present invention includes:

a housing formed with a working chamber;
a temperature detection unit configured for detecting a temperature of the working chamber;
a heating device;
a first fan, the heating device and the first fan being arranged in the working chamber; and
a processor configured for:

controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing;
determining whether the temperature is less than or equal to a first preset temperature; and
when the temperature is less than or equal to the first preset temperature, controlling the heating device and the first fan to operate so as to establish an airflow which dissipates heat generated by the heating device in the working chamber.

[0011] In certain embodiments, the temperature detection unit comprises a temperature sensor.

[0012] In certain embodiments, the heating device comprises a heating tube.

[0013] In certain embodiments, the heating device and the first fan are disposed at a bottom of the working chamber.

[0014] In certain embodiments, the heating device is disposed adjacent to the first fan.

[0015] In certain embodiments, the processor is configured to control the dishwasher to enter a washing process, a rinsing process, and a drying process.

[0016] In certain embodiments, the first preset temper-

ature is 25 °C to 35 °C.

[0017] In certain embodiments, the processor is configured for:

determining whether the temperature is greater than or equal to a second preset temperature, wherein the second preset temperature is greater than the first preset temperature; and

stopping the heating device and the first fan when the temperature is greater than or equal to the second preset temperature.

[0018] In certain embodiments, the second preset temperature is 45 °C to 50 °C.

[0019] In certain embodiments, the housing is provided with an air duct communicating outside and the working chamber, and the dishwasher includes a second fan provided in the air duct; the processor being configured for controlling the second fan to operate when the first fan operates.

[0020] In certain embodiments, the air duct is disposed at a top of the working chamber.

[0021] In certain embodiments, the temperature detection unit is disposed in the air duct or the working chamber.

[0022] A dishwasher according to an embodiment of the present invention includes:

a housing formed with a working chamber;

a temperature detection unit configured for detecting a temperature of the working chamber;

a heating device;

a first fan, the heating device and the first fan being arranged in the working chamber;

one or more processors;

a memory; and

one or more programs stored in the memory and configured to be executed by the one or more processors for executing instructions of the control method.

[0023] A computer-readable storage medium of an embodiment of the present invention includes a computer program for use in conjunction with a dishwasher, the computer program being executable by a processor to perform the control method.

[0024] According to the control method of the dishwasher, the dishwasher and the computer-readable storage medium of the embodiment of the invention, the temperature of the working chamber is increased by controlling the heating device and the fan to operate through the temperature detected by the temperature detection unit and establishing an airflow with heat, thereby avoiding the problems that the working chamber becomes damp and bacteria grow, and improving the hygiene and sanitary condition for tableware such as bowls and dishes and the like to be stored in the dishwasher after being washed.

[0025] Additional aspects and advantages of the invention will be set forth in part in the description which follows and, in part, will be obvious from the description, or may be learned by practice of the invention.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The foregoing and/or additional aspects and advantages of the invention will be apparent from and elucidated with reference to the embodiments described hereinafter and with reference to the accompanying drawings, in which:

Figure 1 is a flow chart illustrating a control method of a dishwasher according to an embodiment of the present invention;

Figure 2 is a schematic structural view of a dishwasher according to an embodiment of the present invention;

Figure 3 is another flow chart of a control method of a dishwasher according to an embodiment of the present invention;

Figure 4 is yet another flow chart of a control method of a dishwasher according to an embodiment of the present invention;

Figure 5 is yet another flow chart of a control method of a dishwasher according to an embodiment of the present invention;

Figure 6 is another schematic structural view of a dishwasher according to an embodiment of the present invention;

Figure 7 is yet another schematic structural view of a dishwasher according to an embodiment of the present invention;

Figure 8 is a schematic diagram of a connection between a dishwasher and a computer-readable storage medium according to an embodiment of the present invention.

Description of Main Element Symbols:

[0027] dishwasher 100, housing 110, working chamber 111, air duct 112, temperature detection unit 120, heating device 130, first fan 140, processor 150, second fan 160, memory 170, computer-readable storage medium 200.

DETAILED DESCRIPTION

[0028] Description will now be made in detail to the embodiments of the present invention, examples of which are illustrated in the accompanying drawings, wherein like or similar reference numerals refer to the same or similar elements or elements having the same or similar function throughout. The embodiments described below with reference to the drawings are exemplary only for the purpose of illustrating the invention and are not to be construed as limiting the invention.

[0029] Referring to Figures 1 and 2 together, the control method of the embodiment of the present invention may be applied to a dishwasher 100. The dishwasher 100 includes a housing 110, a temperature detection unit 120, a heating device 130, and a first fan 140. The housing 110 is formed with a working chamber 111. The temperature detection unit 120 is configured for detecting the temperature of the working chamber 111. A heating device 130 and a first fan 140 are provided in the working chamber 111. The control method comprises the following steps:

S151: controlling the temperature detection unit 120 to detect the temperature after the dishwasher 100 finishes washing;
S152: determining whether the temperature is less than or equal to a first preset temperature; and
S153: controlling the heating device 130 and the first fan 140 to operate to establish an airflow which dissipates heat generated by the heating device 130 in the working chamber 111 when the temperature is less than or equal to the first preset temperature.

[0030] Referring again to Figure 2, the dishwasher 100 of the embodiment of the present invention includes a housing 110, a temperature detection unit 120, a heating device 130, a first fan 140, and a processor 150. The housing 110 is formed with a working chamber 111. The temperature detection unit 120 is configured for detecting the temperature of the working chamber 111. The heating device 130 and the first fan 140 are provided in the working chamber 111. The processor 150 is configured for:

controlling the temperature detection unit 120 to detect the temperature after the dishwasher 100 finishes washing;
determining whether the temperature is less than or equal to a first preset temperature; and
controlling the heating device 130 and the first fan 140 to operate to establish an airflow which dissipates heat generated by the heating device 130 in the working chamber 111 when the temperature is less than or equal to the first preset temperature.

[0031] That is, the control method of the embodiment of the present invention may be implemented by the dishwasher 100 of the embodiment of the present invention, wherein the steps S151, S152, and S153 may be implemented by the processor 150.

[0032] The control method of the dishwasher 100 and the dishwasher 100 of the embodiment of the present invention use the temperature detected by the temperature detection unit 120 to control the heating device 130 and the fan 140 to operate to establish the airflow with heat, thereby increasing the temperature of the working chamber 111, avoiding the problems of humidifying of the working chamber 111 and growth of bacteria, thereby improving the hygiene and sanitary condition for tableware such as bowls and dishes and the like to be stored in the dishwasher 100 after being washed.

[0033] In some embodiments, the temperature detection unit 120 includes a temperature sensor. In this way, the temperature can be quickly obtained using a temperature sensor.

[0034] As can be appreciated, when the temperature is relatively low, the water vapor in the dishwasher 100 easily condenses into water droplets, thereby adhering to the dishes, making the dishes moist and easy to breed bacteria, so that the heating device 130 and the first fan 140 can be controlled to operate, evaporating the water droplets and taking them out of the working chamber 111 by means of the airflow with heat.

[0035] In certain embodiments, the heating device 130 includes a heating tube. In this manner, the heating device 130 may be utilized to operate to generate heat.

[0036] In some embodiments, the first preset temperature is between 25 °C and 35 °C. In this way, it is ensured that the water vapor in the working chamber 111 is not easily condensed, and the energy consumption of the dishwasher 100 can be reduced.

[0037] Specifically, if the value of the first preset temperature is too small, such as less than 25 °C, the temperature of the working chamber 111 may be lower than 25 °C, and when the temperature of the working chamber 111 is lower than 25 °C, the water vapor in the working chamber 111 is easy to saturate and condense into water drops; if the value of the first preset temperature is too large, for example, greater than 35 °C, it is necessary to increase the operating time of the heating device 130 and the first fan 140 or to increase the operating power of the heating device 130 and the first fan 140, thereby increasing the energy consumption of the dishwasher 100. Accordingly, the first preset temperature may be set to 25 °C to 35 °C. In other embodiments, the first preset temperature may also be adjusted according to user requirements, for example, the first preset temperature may also be between 20 °C and 40 °C.

[0038] The working chamber 111, also called an inner container, may refer to a part of the dishwasher 100 where tableware can be placed and washed.

[0039] In some embodiments, the first fan 140 may be controlled to operate for a predetermined period of time before the temperature detection unit 120 detects the temperature, thereby making the temperature detected by the temperature detection unit 120 more accurate. Specifically, there is a deviation in the temperature detected by the temperature detection unit 120 due to uneven distribution of heat. For example, if the temperature detection unit 120 is disposed near the heating device 130, the temperature detected by the temperature detection unit 120 may be high, and if the temperature detection unit 120 is disposed far away from the heating device 130, the temperature detected by the temperature detection unit 120 may be low. Therefore, the first fan 140 can be controlled to operate for a preset period of time before the temperature detection unit 120 detects

the temperature, so that the air in the working chamber 111 can be circulated, the heat of each position in the working chamber 111 is balanced, and the temperature detected by the temperature detection unit 120 is more accurate.

[0040] In some embodiments, temperature detection unit 120 may detect and obtain multiple temperatures and take an intermediate or average value of the multiple temperatures as the temperature of working chamber 111. Thus, the accuracy of the temperature can be guaranteed.

[0041] In some embodiments, when the temperature is greater than the first preset temperature, the temperature detection unit 120 may be controlled to detect the temperature after a first time interval, i.e., step S151 is re-executed after the first time interval. In addition, the heating device 130 and the first fan 140 can be controlled to keep the original state, that is, to keep operating if the heating device 130 and the first fan 140 were previously in the operating state, and to remain closed if the heating device 130 and the first fan 140 were previously closed.

[0042] Referring again to Figure 2, in some embodiments, the heating device 130 and the first fan 140 are disposed at a bottom of the working chamber 111.

[0043] In this manner, the airflow with heat created by the operation of the heating device 130 and the first fan 140 readily flows through the entire working chamber 111.

[0044] As can be appreciated, the density of the hot air is small, and the airflow with heat formed by the heating device 130 and the first fan 140 tends to rise upward, so that the heating device 130 and the first fan 140 are disposed at the bottom of the working chamber 111, so that the airflow with heat can flow through the whole working chamber 111, and water droplets in the working chamber 111 are evaporated and carried out of the working chamber 111.

[0045] In one embodiment, the first fan 140 is disposed adjacent to the heating device 130 such that the first fan 140 can blow heat generated by operation of the heating device 130 toward the working chamber 111.

[0046] Referring to Figure 3, in some embodiments, the control method includes the following steps before the dishwasher 100 finishes washing:

S154: controlling the dishwasher 100 to enter a washing process, a rinsing process, and a drying process.

[0047] Referring again to Figure 2, in some embodiments, the processor 150 is configured to control the dishwasher 100 to enter a washing process, a rinsing process, and a drying process.

[0048] That is, step S154 may be implemented by processor 150.

[0049] In this way, the dishwasher 100 can clean and dry the dishes in the working chamber 111.

[0050] Specifically, the end of washing of the dishwasher 100 means that the dishwasher 100 has finished the washing process, which generally sequentially includes several processes of washing, rinsing, and drying, and the end of washing of the dishwasher 100 generally means that the drying process has finished. Steps S151, S152, and S153 of an embodiment of the present invention may be regarded as a custody procedure, and steps S151, S152, and S153 may be performed in a plurality of cycles to keep the working chamber 111 dry.

[0051] Referring to Figure 4, in some embodiments, the control method includes the following steps:

S155: determining whether the temperature is greater than or equal to a second preset temperature, wherein the second preset temperature is greater than the first preset temperature; and

S156: stopping the heating device 130 and the first fan 140 when the temperature is greater than or equal to the second preset temperature.

[0052] Referring again to Figure 2, in some embodiments, the processor 150 is configured to:

determining whether the temperature is greater than or equal to a second preset temperature, wherein the second preset temperature is greater than the first preset temperature; and

stopping the heating device 130 and the first fan 140 when the temperature is greater than or equal to the second preset temperature.

[0053] That is, steps S155 and S156 may be implemented by processor 150.

[0054] In this manner, the energy consumption of the dishwasher 100 can be reduced and damage to the heating device 130 and the first fan 140 can be avoided.

[0055] Specifically, when the temperature is relatively high, for example, when the temperature is greater than or equal to the second preset temperature, it is difficult for the water vapor in the working chamber 111 to condense into water droplets, so that the heating device 130 and the first fan 140 can be stopped, thereby reducing the power consumption of the dishwasher 100. On the other hand, it is possible to avoid the problem of damage such as burning, abrasion and the like caused by the fact that the heating device 130 and the first fan 140 are always in operation.

[0056] In some embodiments, when the temperature is less than the second preset temperature, the temperature detection unit 120 may be controlled to detect the temperature after a second time interval, i.e., step S151 is re-executed after the second time interval. In addition, the heating device 130 and the first fan 140 can be controlled to keep the original state, that is, to keep operating if the heating device 130 and the first fan 140 were previously in the operating state; and to remain closed if the heating device 130 and the first fan 140 were previously closed.

[0057] It should be noted that the first time interval and the second time interval may be the same or different and are not specifically limited herein.

[0058] In some embodiments, the second preset temperature is between 45 °C and 50 °C. In this manner, frequent operation and stoppage of the heating device 130 and the first fan 140 can be avoided, and energy consumption of the dishwasher 100 can be reduced.

[0059] Specifically, if the value of the second preset temperature is too small, for example, less than 45 °C, the second preset temperature may be closer to the first preset temperature, so that the temperature of the working chamber 111 is easily less than or equal to the first preset temperature after the heating device 130 and the first fan 140 are stopped for a short period of time, that is, the heating device 130 and the first fan 140 are operated again within a short time after being stopped. The heating device 130 and the first fan 140 are frequently operated and stopped, which may cause damage to the heating device 130 and the first fan 140; if the value of the second preset temperature is too large, for example, greater than 50 °C, the operating time of the heating device 130 and the first fan 140 needs to be increased or the operating power of the heating device 130 and the first fan 140 needs to be increased, thereby increasing the power consumption of the dishwasher 100. Therefore, the second preset temperature may be set to 45 °C to 50 °C. In other embodiments, the second preset temperature may also be adjusted according to user requirements, for example, the second preset temperature may also be between 45 °C and 60 °C.

[0060] Referring to Figures 5 and 6 together, in some embodiments, the housing 110 is provided with an air duct 112 communicating outside and the working chamber 111, and the dishwasher 100 includes a second fan 160 disposed within the air duct 112; the control method comprises the following steps:

S157: controlling the second fan 160 to operate when the first fan 140 operates.

[0061] Referring again to Figure 6, in some embodiments, the housing 110 is provided with an air duct 112 communicating outside (exterior of the dishwasher 100) and the working chamber 111, the dishwasher 100 including a second fan 160 disposed within the duct 112; the processor 150 is configured to control the second fan 160 to operate when the first fan 140 operates.

[0062] That is, step S157 may be implemented by processor 150.

[0063] In this manner, the first fan 140 and the second fan 160 may cooperate to establish an airflow communicating the outside and the working chamber 111, thereby improving the dehumidification effect.

[0064] Specifically, the second fan 160 may be provided in the air duct 112 communicating the outside and the working chamber 111. The airflow with heat formed by the operation of the heating device 130 and the first fan 140 evaporates the water droplets so that the airflow carries the water vapor, and the second fan 160 directs the air flow from the inside of the working chamber 111 to the outside so that the water vapor can be discharged from the working chamber 111 to the outside.

[0065] Referring again to Figure 6, in some embodiments, the air duct 112 is disposed at the top of the working chamber 111.

[0066] In this way, the airflow with heat formed by the operation of the heating device 130 and the first fan 140 easily flows to the outside.

[0067] It will be appreciated that the density of the hot air is small, and the airflow with heat formed by the heating device 130 and the first fan 140 tends to rise, so that the air duct 112 is disposed at the top of the working chamber 111 so that the airflow with heat rises and then flows out of the air duct 112. In addition, the second fan 160 is arranged in the air duct 112 and the air duct 112 is arranged at the top of the working chamber 111, so that the airflow with heat can be conveniently guided to the outside when the second fan 160 works.

[0068] In some embodiments, since the space of the working chamber 111 is limited, for example, the working chamber 111 is small, the temperature detection unit 120 cannot be directly installed in the working chamber 111, and therefore, the temperature detection unit 120 can be installed in the air duct 112, and the temperature in the air duct 112 can be detected by the temperature detection unit 120. In some embodiments, the temperature within the air duct 112 may be considered the temperature of the working chamber 111.

[0069] In some embodiments, the temperature detection unit 120 may be disposed directly within the working chamber 111 to accurately obtain the temperature of the working chamber 111, and is not specifically limited thereto.

[0070] Referring to Figure 7, a dishwasher 100 according to an embodiment of the present invention includes a housing 110, a temperature detection unit 120, a heating device 130, a first fan 140, one or more processors 150, a memory 170, and one or more programs. One or more programs are stored in memory 170 and configured to be executed by one or more processors 150 for executing instructions of the control method of any of the above-described embodiments of the present invention.

[0071] As one example, the program may be used to execute instructions for the following control method:

S151: controlling the temperature detection unit 120 to detect the temperature after the dishwasher 100 finishes washing;

S152: determining whether the temperature is less than or equal to a first preset temperature; and

S153: controlling the heating device 130 and the first fan 140 to operate to establish an airflow which dissipates heat generated by the heating device 130 in the working chamber 111 when the temperature is less than or equal to the first preset temperature.

[0072] Referring to Figure 8, a computer-readable storage medium 200 of an embodiment of the present invention includes a computer program for use in conjunction with a dishwasher 100, the computer program being ex-

ecutable by a processor 150 to perform the control method of any of the above-described embodiments of the present invention.

[0073] As one example, the computer program may be executed by processor 150 to perform the following control methods:

S151: controlling the temperature detection unit 120 to detect the temperature after the dishwasher 100 finishes washing;
S152: determining whether the temperature is less than or equal to a first preset temperature; and
S153: controlling the heating device 130 and the first fan 140 to operate to establish an airflow which dissipates heat generated by the heating device 130 in the working chamber 111 when the temperature is less than or equal to a first preset temperature.

[0074] It should be noted that the computer-readable storage medium 200 may be a storage medium built into the dishwasher 100 or may be a pluggable storage medium capable of being insertedinto the dishwasher 100.

[0075] In describing embodiments of the present invention, the terms "first" and "second" are used for descriptive purposes only and are not to be construed as indicating or implying relative importance or implicitly indicating the number of technical features indicated. Thus, features defined with "first" and "second" may explicitly or implicitly include one or more of the described features. In describing embodiments of the present invention, the meaning of "multiple" is two or more, unless specifically defined otherwise.

[0076] In describing embodiments of the present invention, it is to be understood that, unless specifically stated and defined otherwise, the terms "mounted", "joined", and "connected" are to be broadly construed as being, for example, fixedly connected, removably connected, or integrally connected; they can be mechanically connected or electrically connected or can communicate with each other; they may be connected directly or indirectly through intervening media, either internal to the two elements or in an interactive relationship between the two elements. The specific meaning of the above terms in the embodiments of the present invention will be understood by those of ordinary skill in the art as the case may be.

[0077] In the description of this specification, the description of the terms "one embodiment", "some embodiments", "illustrative embodiments", "examples", "specific examples", or " some examples", etc., means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the invention. In this specification, schematic representations of the above terms do not necessarily refer to the same embodiment or example. Furthermore, the particular features, structures, materials, or characteristics described may be combined in any suitable manner in any one or more embodiments or examples.

[0078] Any process or method description in the flowchart or otherwise described herein may be understood to represent modules, segments, or portions of code comprising one or more executable instructions for implementing the steps of a particular logical function or process, and the scope of the preferred embodiments of the present invention includes additional implementations, which may not be in the order shown or discussed, including performing functions in a substantially simultaneous manner or in a reverse order according to the functions involved. This should be understood by those skilled in the art to which embodiments of the present invention pertain.

[0079] Logic and/or steps shown in the flowcharts or otherwise described herein, for example, as an ordered listing of executable instructions that may be considered to implement logical functions, may be embodied in any computer-readable medium for use by an instruction execution system, apparatus, or device (e.g., a computer-based system, system including a processing module, or other instruction execution system, apparatus, or device, system for fetching and executing instructions). For the purposes of this specification, a "computer-readable medium" can be any means that can contain, store, communicate, propagate, or transport the program for use by or in connection with instruction execution system, apparatus, or device. More specific examples (a non-exhaustive list) of the computer-readable medium include the following: an electrical connection (electronic device) having one or more wiring lines, a portable computer cartridge (magnetic device), a random access memory (RAM), a read-only memory (ROM), an erasable programmable read-only memory (EPROM or Flash memory), an optical fiber device, and a portable compact disc read-only memory (CDROM). In addition, the computer-readable medium may even be paper or other suitable medium upon which the program is printed, as the program may be electronically obtained, such as by optically scanning the paper or other medium, followed by editing, interpreting, or otherwise processing in a suitable manner if necessary, and then stored in a computer memory.

[0080] It is to be understood that portions of embodiments of the present invention may be implemented in hardware, software, firmware, or a combination thereof. In the embodiments described above, the steps or methods may be implemented in software or firmware stored in memory and executed by a suitable instruction execution system. For example, if implemented in hardware, as in another embodiment, it may be implemented using any one or a combination of the following techniques known in the art: discrete logic circuits with logic gates for implementing logic functions on data signals, application specific integrated circuits with appropriate combinational logic gates, programmable gate arrays (PGAs), field programmable gate arrays (FPGAs), etc.

[0081] It will be appreciated by one of ordinary skill in

the art that all or a portion of the steps carried by a method of implementing the above-described embodiments may be performed by program instructing an associated hardware, which may be stored in a computer-readable storage medium, and which when executed, includes one or a combination of the steps of the method embodiments.

[0082] Furthermore, various functional units in the various embodiments of the present invention may be integrated in one processing module, may be physically separate units, or may be integrated in one module in two or more units. The integrated module can be realized in the form of hardware or software functional modules. The integrated module, if implemented in the form of a software functional module and sold or used as a stand-alone product, may also be stored in a computer-readable storage medium.

[0083] The above-mentioned storage medium may be a read-only memory, a magnetic or optical disk, or the like.

[0084] While embodiments of the present invention have been shown and described above, it is to be understood that the above-described embodiments are illustrative and not restrictive of the invention, as changes, modifications, substitutions and variations of the above-described embodiments may occur to those skilled in the art without departing from the scope of the invention.

Claims

1. A control method of a dishwasher, **characterized in that** the dishwasher comprises a housing, a temperature detection unit, a heating device and a first fan, wherein a working chamber is formed in the housing, and the temperature detection unit is configured for detecting a temperature of the working chamber, the heating device and the first fan are disposed in the working chamber, and the control method comprises the following steps:

    controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing;
    determining whether the temperature is less than or equal to a first preset temperature; and
    when the temperature is less than or equal to the first preset temperature, controlling the heating device and the first fan to operate so as to establish an airflow which dissipates heat generated by the heating device in the working chamber.

2. The control method according to claim 1, **characterized in that** the control method comprises the following step before the dishwasher finishes washing:
controlling the dishwasher to enter a washing process, a rinsing process and a drying process.

3. The control method according to claim 1, **characterized in that** the first preset temperature is 25 °C to 35 °C.

4. The control method according to claim 1, **characterized in that** the control method comprises the steps of:

    determining whether the temperature is greater than or equal to a second preset temperature, wherein the second preset temperature is greater than the first preset temperature; and
    stopping the heating device and the first fan when the temperature is greater than or equal to the second preset temperature.

5. The control method according to claim 4, **characterized in that** the second preset temperature is 45 °C to 50 °C.

6. The control method according to claim 1, **characterized in that** the housing is provided with an air duct communicating outside and the working chamber, and the dishwasher comprises a second fan provided in the air duct; the control method comprises the following step:
controlling the second fan to operate when the first fan operates.

7. A dishwasher, **characterized by** comprising:

    a housing formed with a working chamber;
    a temperature detection unit configured for detecting a temperature of the working chamber;
    a heating device;
    a first fan, the heating device and the first fan being disposed in the working chamber; and
    a processor configured for:

        controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing;
        determining whether the temperature is less than or equal to a first preset temperature; and
        when the temperature is less than or equal to the first preset temperature, controlling the heating device and the first fan to operate so as to establish an airflow which dissipates heat generated by the heating device in the working chamber.

8. The dishwasher according to claim 7, **characterized in that** the temperature detection unit comprises a temperature sensor.

9. The dishwasher according to claim 7, **characterized in that** the heating device comprises a heating tube.

10. The dishwasher according to claim 7, **characterized in that** the heating device and the first fan are disposed at a bottom of the working chamber.

11. The dishwasher according to claim 10, **characterized in that** the heating device is disposed adjacent to the first fan.

12. The dishwasher according to claim 7, **characterized in that** the processor is configured to control the dishwasher to enter a washing process, a rinsing process, and a drying process.

13. The dishwasher according to claim 7, **characterized in that** the first preset temperature is 25 °C to 35 °C.

14. The dishwasher according to claim 7, **characterized in that** the processor is configured for:

determining whether the temperature is greater than or equal to a second preset temperature, wherein the second preset temperature is greater than the first preset temperature; and
stopping the heating device and the first fan when the temperature is greater than or equal to the second preset temperature.

15. The dishwasher according to claim 14, **characterized in that** the second preset temperature is 45 °C to 50 °C.

16. The dishwasher according to claim 7, **characterized in that** the housing is provided with an air duct communicating outside and the working chamber, and the dishwasher comprises a second fan provided in the air duct; the processor is configured for controlling the second fan to operate when the first fan operates.

17. The dishwasher according to claim 16, **characterized in that** the air duct is disposed at a top of the working chamber.

18. The dishwasher according to claim 16, **characterized in that** the temperature detection unit is disposed in the air duct or the working chamber.

19. A dishwasher, **characterized by** comprising:

a housing formed with a working chamber;
a temperature detection unit configured for detecting a temperature of the working chamber;
a heating device;
a first fan, the heating device and the first fan being disposed in the working chamber;
one or more processors;
a memory; and
one or more programs stored in the memory and configured to be executed by the one or more processors for executing instructions of a control method according to any one of claims 1 to 6.

20. A computer-readable storage medium, **characterized by** comprising a computer program for use in conjunction with a dishwasher, the computer program being executable by a processor to perform a control method according to any one of claims 1-6.

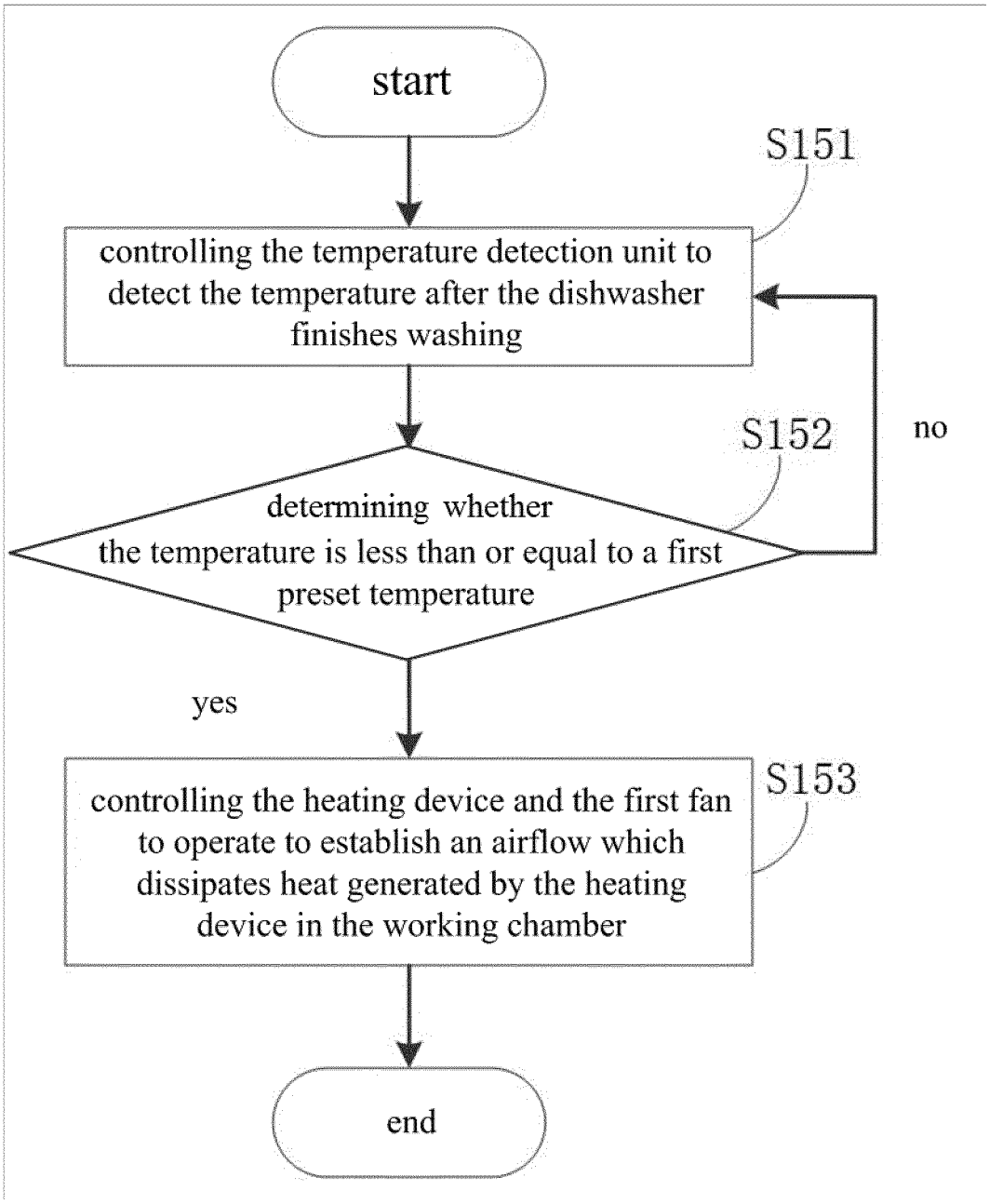
start
S151
controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing
S152
determining whether the temperature is less than or equal to a first preset temperature
no
yes
S153
controlling the heating device and the first fan to operate to establish an airflow which dissipates heat generated by the heating device in the working chamber
end

Fig. 1

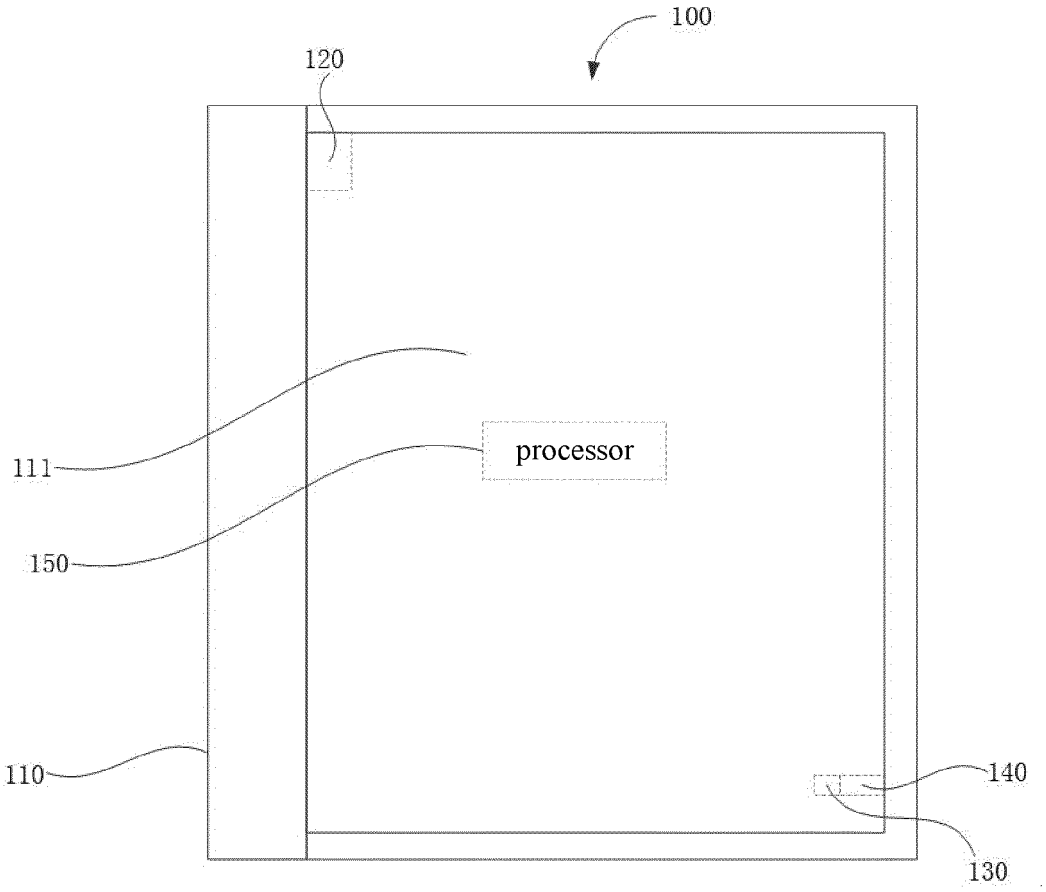

Fig. 2

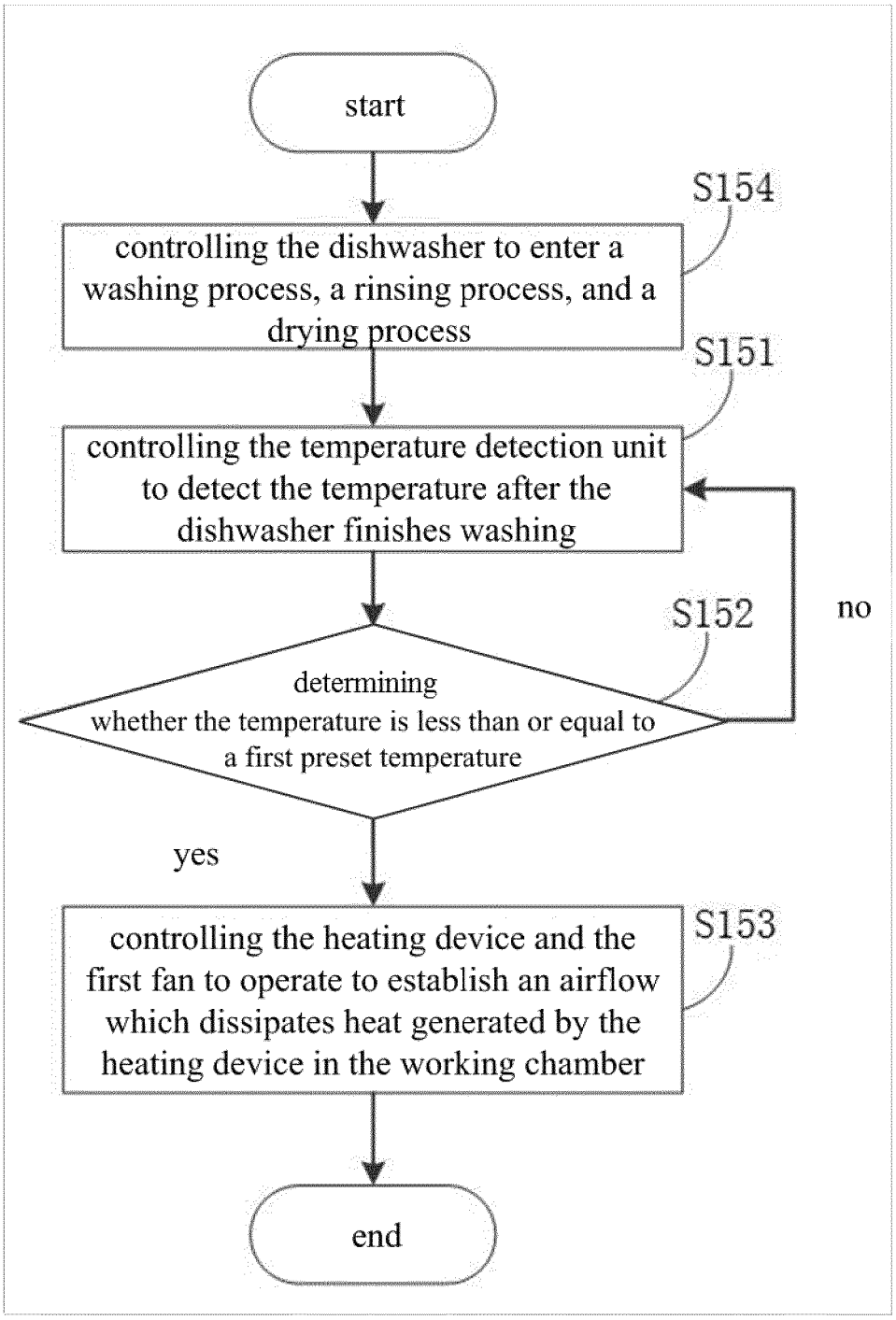
start
S154
controlling the dishwasher to enter a washing process, a rinsing process, and a drying process
S151
controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing
S152
determining whether the temperature is less than or equal to a first preset temperature
no
yes
S153
controlling the heating device and the first fan to operate to establish an airflow which dissipates heat generated by the heating device in the working chamber
end

Fig. 3

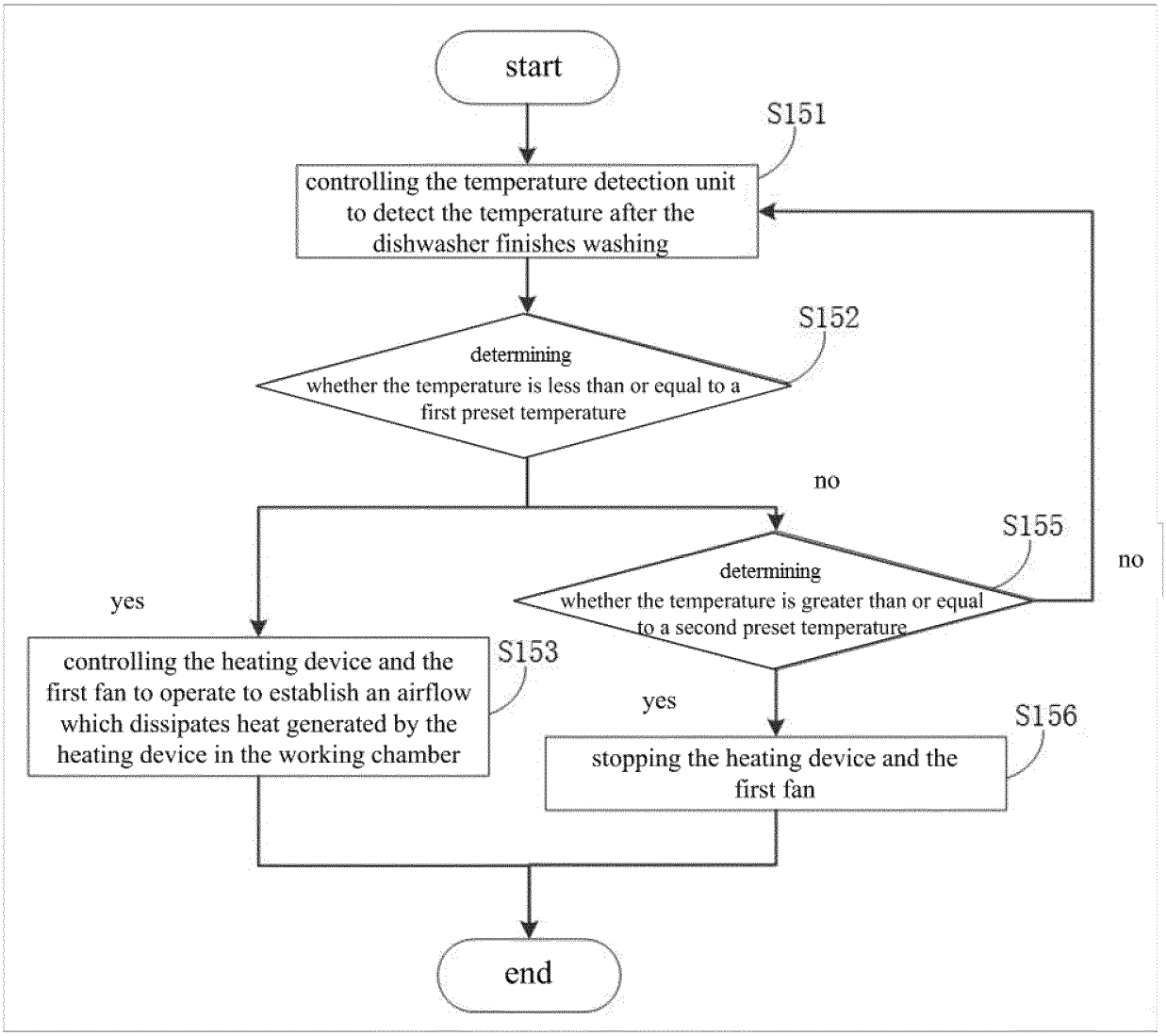
start
S151
controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing
S152
determining whether the temperature is less than or equal to a first preset temperature
no
yes
S155
determining whether the temperature is greater than or equal to a second preset temperature
no
yes
S153
controlling the heating device and the first fan to operate to establish an airflow which dissipates heat generated by the heating device in the working chamber
S156
stopping the heating device and the first fan
end

Fig. 4

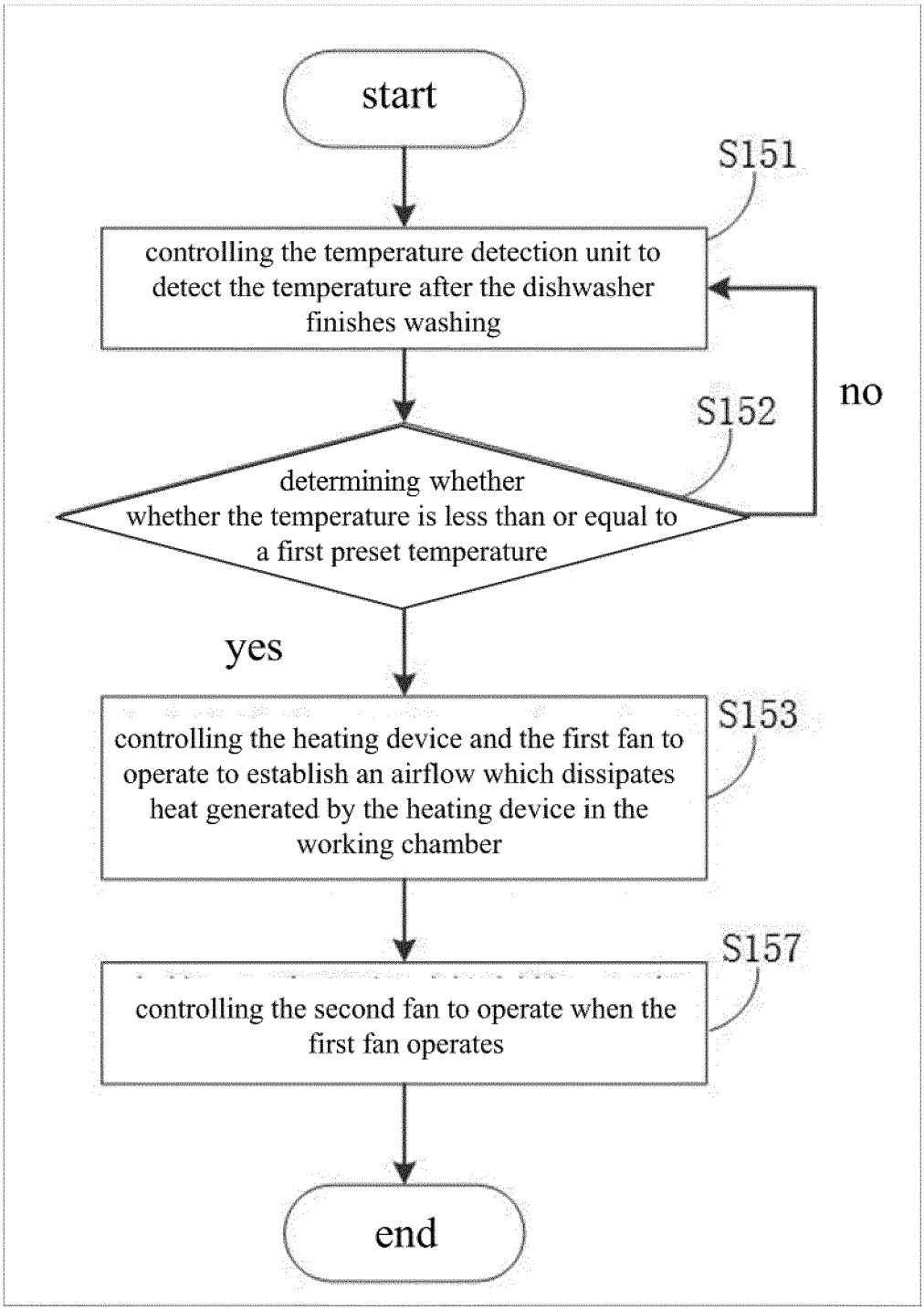
start
S151
controlling the temperature detection unit to detect the temperature after the dishwasher finishes washing
S152
determining whether whether the temperature is less than or equal to a first preset temperature
no
yes
S153
controlling the heating device and the first fan to operate to establish an airflow which dissipates heat generated by the heating device in the working chamber
S157
controlling the second fan to operate when the first fan operates
end

Fig. 5

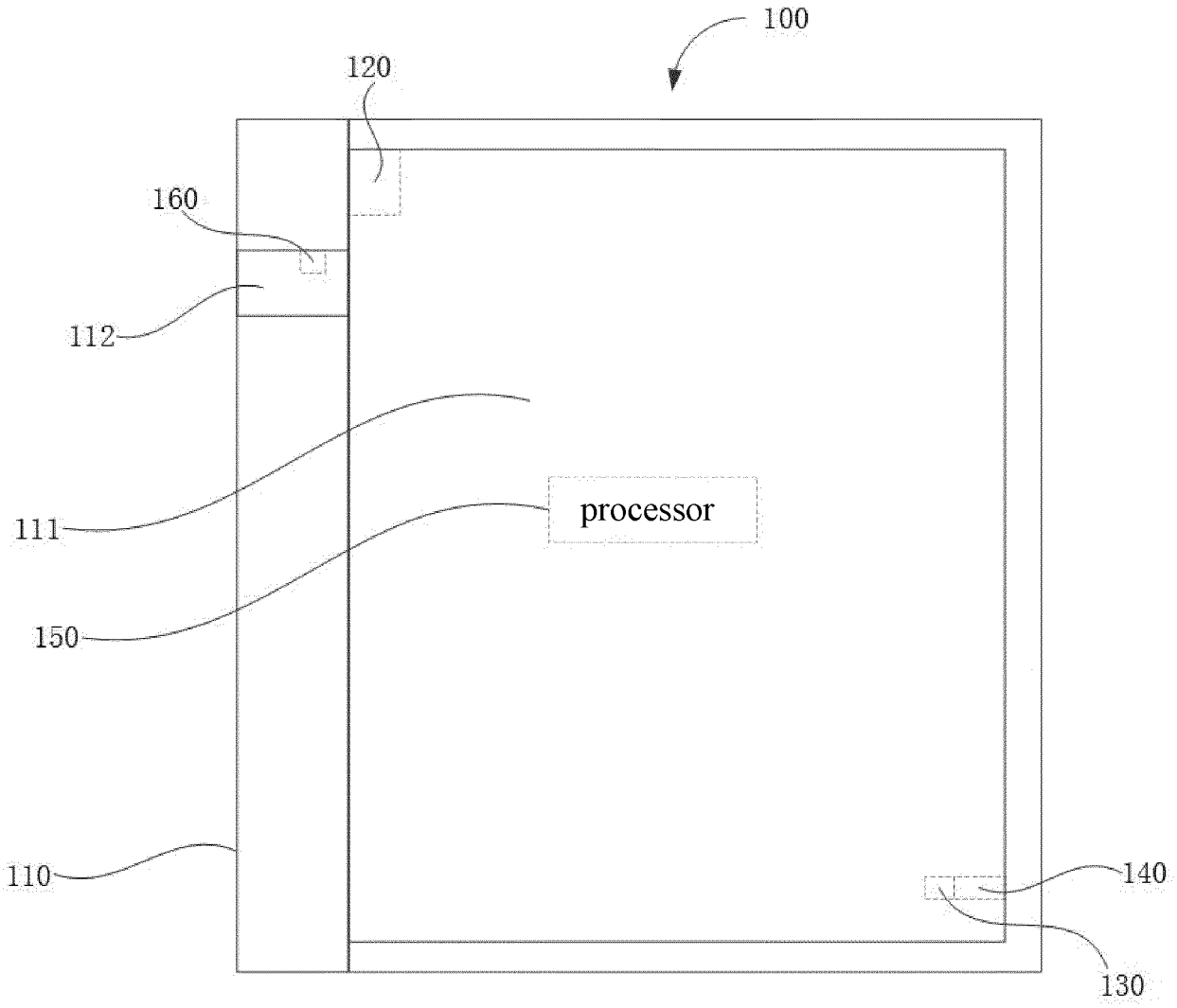

Fig. 6

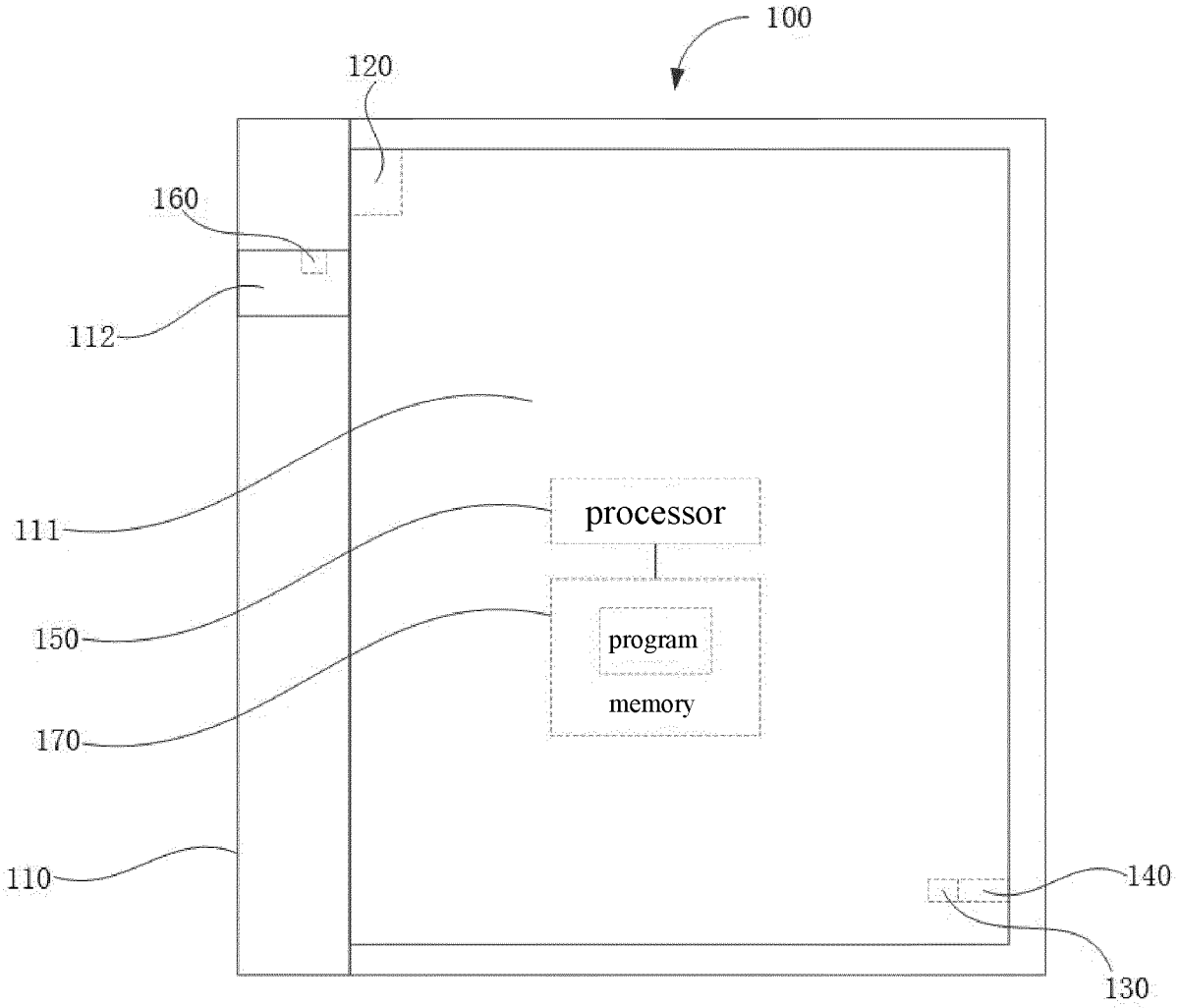
100
120
160
112
111
processor
150
program
memory
170
110
140
130

Fig. 7

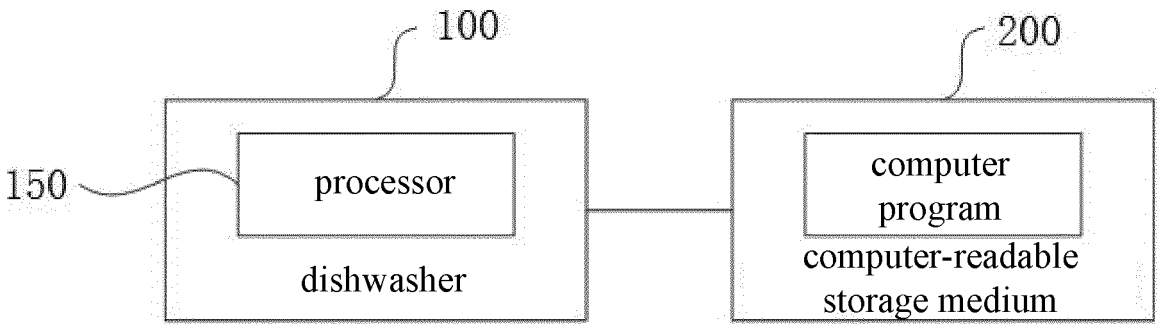
100
200
150
processor
dishwasher
computer program
computer-readable storage medium

Fig. 8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/073693

A. CLASSIFICATION OF SUBJECT MATTER

A47L 15/00 (2006.01) i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS, CNTXT, VEN, CJFD: 美的, 黄华明, 韩冰, 温度, 辛载奎, 风机, 加热, 控制, 洗碗机, dishwasher, control+, temperature, b1ow+, fan, heat+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 107440654 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 08 December 2017 (08.12.2017), entire document	1-19
Y	CN 106725184 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 31 May 2017 (31.05.2017), figures 1-4, and description, paragraphs [0004]-[0070]	1-19
Y	CN 104706298 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 17 June 2015 (17.06.2015), figures 1-5, and description, paragraphs [0023]-[0063]	1-19
A	US 5337500 A (TOSHIBA K.K.) 16 August 1994 (16.08.1994), entire document	1-19
A	DE 102007059516 A1 (BSH BOSCH SIEMENS HAUSGERAETE) 18 June 2009 (18.06.2009), entire document	1-19

☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 May 2018	16 May 2018
Name and mailing address of the ISA State Intellectual Property Office of the P. R. China No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088, China Facsimile No. (86-10) 62019451	Authorized officer SHU, Chang Telephone No. (86-10) 62085708

Form PCT/ISA /210 (second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/073693

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 1498584 A (SAMSUNG ELECTRONICS CO., LTD.) 26 May 2004 (26.05.2004), entire document	1-19

Form PCT/ISA /210 (continuation of second sheet) (July 2009)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2018/073693

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.:20
because they relate to subject matter not required to be searched by this Authority, namely:
The content of claim 20 relates to the mere presentations of information and computer programs as defined in Rule 39.1, and therefore belongs to the search subject matter excluded by the International Searching Authority.

2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:

3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.

2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of additional fees.

3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:

4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on protest

☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.

☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.

☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA /210 (continuation of first sheet (2)) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2018/073693

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
CN 107440654 A	08 December 2017	None	
CN 106725184 A	31 May 2017	None	
CN 104706298 A	17 June 2015	None	
US 5337500 A	16 August 1994	GB 9301568 D0	17 March 1993
		JP H05211978 A	24 August 1993
		GB 2263969 B	12 July 1995
		GB 2263969 A	11 August 1993
DE 102007059516 A1	18 June 2009	WO 2009074416 A1	18 June 2009
		RU 2010125032 A	20 January 2012
		EP 2222219 B1	14 September 2011
		CN 101896113 B	10 April 2013
		AT 524100 T	15 September 2011
		EP 2289389 A1	02 March 2011
		CN 101896113 A	24 November 2010
		ES 2369513 T3	01 December 2011
		RU 2493766 C2	27 September 2013
		US 2010236575 A1	23 September 2010
		PL 2222219 T3	29 February 2012
		EP 2222219 A1	01 September 2010
		EP 2289389 B1	04 April 2012
		ES 2381992 T3	04 June 2012
		AT 551942 T	15 April 2012
CN 1498584 A	26 May 2004	JP 3971364 B2	05 September 2007
		US 7093604 B2	22 August 2006
		EP 1415587 A2	06 May 2004
		EP 1415587 A3	29 June 2005
		JP 2004154566 A	03 June 2004
		CN 1235539 C	11 January 2006

Form PCT/ISA /210 (patent family annex) (July 2009)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2018/073693

Patent Documents referred in the Report	Publication Date	Patent Family	Publication Date
		US 2004134519 A1	15 July 2004

Form PCT/ISA /210 (patent family annex) (July 2009)

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 201710776080 **[0001]**