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(54) REFRIGERATOR CONTROL METHOD

(57) A refrigerator control method comprises: collecting working parameters of an ice making system; when the working parameters meet a preset normal defrosting condition of an ice making evaporator, controlling a defrosting unit corresponding to the ice making evaporator to be started; and when information on an amount of ice in an ice bin is detected to be full ice information, and when the working parameters meet a preset full ice defrosting condition of the ice making evaporator, controlling the defrosting unit corresponding to the ice making evaporator to be started.

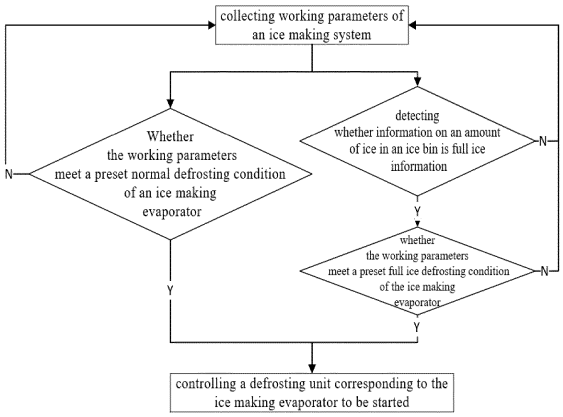

FIG.3

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Description

TECHNICAL FIELD OF THE INVENTION

[0001] The present application relates to the field of household appliances, and in particular, to a refrigerator control method, a storage medium and a refrigerator.

BACKGROUND OF THE INVENTION

[0002] Currently, a refrigerator becomes an indispensable household appliance in home life. The refrigerator is provided therein with a refrigerating system for refrigeration comprising an evaporator, and after the refrigerating system is used for a period of time, frost forms on a surface of the evaporator, and therefore, in order to guarantee a refrigeration effect of the refrigerating system, the evaporator is required to be defrosted periodically. When the evaporator is defrosted, a temperature in a refrigerator compartment rises.

[0003] In order to meet demands of users, ice making devices are further mounted in some refrigerators. The ice making device may be mounted on a cabinet or a door of the refrigerator, and the ice making device may comprise an ice bin for storing ice. However, the ice making device is generally not considered in the defrosting process of the existing refrigerator, and defrosting is started when the evaporator reaches a defrosting cycle. The temperature rise in the defrosting process often causes ice cubes in the ice bin to melt or an ice making cycle to be prolonged, thus increasing energy consumption of the refrigerator.

SUMMARY OF THE INVENTION

[0004] In order to solve the above problems, the present application provides a refrigerator control method, a computer storage medium and a refrigerator.

[0005] In the refrigerator control method according to the present application, when an ice bin is full of ice, and when a normal defrosting condition is not met at this point, whether an ice making evaporator meets a full ice defrosting condition is judged, and when an ice amount of the ice bin meets the full ice defrosting condition, defrosting of the ice making evaporator is started in advance, such that an influence of the defrosting of the ice making evaporator on an ice making device can be minimized, and meanwhile, energy consumption can be saved.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006]

FIG. 1 is a schematic diagram of a refrigerator according to an embodiment of the present application;
FIG. 2 is another schematic diagram of the refrigerator shown in FIG. 1;
FIG. 3 is a schematic flow diagram of a refrigerator control method according to a first embodiment of the present application;
FIG. 4 is a schematic flow diagram of a refrigerator control method according to a second embodiment of the present application;
FIG. 5 is a schematic detailed flow diagram of the refrigerator control method according to the second embodiment of the present application;
FIG. 6 is a schematic flow diagram of a refrigerator control method according to a third embodiment of the present application;
FIG. 7 is a schematic detailed flow diagram of the refrigerator control method according to the third embodiment of the present application; and
FIG. 8 is a schematic diagram of a refrigerator according to an embodiment of the present application.

DETAILED DESCRIPTION OF THE INVENTION

[0007] In order to make those skilled in the art to better understand the technical solutions of the present application, the technical solutions in the embodiments of the present application are clearly and completely described with reference to the accompanying drawings in the embodiments of the present application, and apparently, the described embodiments are not all but only a part of the embodiments of the present application. All other embodiments obtained by a person of ordinary skill in the art based on the embodiments of the present application without creative efforts shall fall within the protection scope of the present application.

[0008] Referring to FIGS. 1 and 2, an embodiment of the present application provides a refrigerator 100, comprising a cabinet 110, a storage space formed in the cabinet 110 may comprise a refrigerating compartment 111 and a freezing compartment 112, and a refrigerating door 121 for opening and closing the refrigerating compartment 111 and a freezing door 122 for opening and closing the freezing compartment 112 may be connected to the cabinet 110. An ice making device 150 is mounted in the refrigerator 100, an ice making compartment 113 can be provided on the refrigerating door 121, the ice making device 150 can be mounted inside the ice making compartment 113, and an ice making door for opening and closing the ice making compartment 113 and a dispenser communicated with the ice making compartment 113 can also be mounted on the refrigerating door 121. The ice making device 150 may comprise an ice making tray and an ice bin 151 provided under the ice making tray, and a user may open the ice making door to take out the ice bin 151 inside the ice making compartment 113, or may directly take out ice cubes in the ice bin 151 through the dispenser without opening the refrigerating door 121 and the ice making door.

[0009] The refrigerator 100 may further comprise a water supply device for supplying water into the ice making tray, the water supply device supplys liquid water into the ice making tray when ice making is started, and after the

liquid water in the ice making tray is completely frozen, the ice making device 150 performs an ice turning operation to discharge the ice cubes in the ice making tray into the ice bin 151 for storage. A flexible ice making tray may be adopted in the ice making device 150, and the ice may be turned by twisting the ice making tray, or by mounting an ice turning structure, such as an ice rake 152, or the like.

[0010] The ice making device 150 may further comprise an ice amount detection assembly for detecting information on an amount of the ice in the ice bin 151, and the ice amount detection assembly may be configured as an ice detection rod mounted on one side of the ice making tray, or a sensor for detecting a height or weight of the ice in the ice bin 151, such as an infrared sensor, an ultrasonic sensor, a pressure sensor, or the like, mounted at the ice bin 151 or another location.

[0011] The ice amount detection assembly may work according to a predetermined program to detect the information on the amount of the ice in the ice bin 151. When the water in the ice making tray is completely frozen to generate an ice turning signal, the ice amount detection assembly may be controlled to detect the information on the amount of the ice in the ice bin 151, and when the information on the amount of the ice in the ice bin 151 indicates a non-full ice state, the ice making device 150 may be controlled to turn the ice, and when the information on the amount of the ice in the ice bin 151 indicates a full ice state, the ice making device 150 may be inhibited from turning the ice. The ice amount detection assembly may also detect the information on the amount of the ice in the ice bin 151 every time ice taking is completed, or detect the information on the amount of the ice in the ice bin 151 after detecting that the ice making door is opened and then closed.

[0012] The refrigerator 100 further comprises a refrigerating system which may comprise a compressor, a condenser, an ice making evaporator 131, an ice making capillary tube, an ice making air return tube, a cabinet evaporator 141, a cabinet capillary tube, and a cabinet air return tube. After flowing through the condenser, a refrigerant flowing out of the compressor may flow through the ice making capillary tube, the ice making evaporator 131 and the ice making air return tube in sequence and then flow back to the compressor to supply cold air to the ice making compartment 113, or may flow through the cabinet capillary tube, the cabinet evaporator 141 and the cabinet air return tube in sequence and then flow back to the compressor to supply cold air to the refrigerating compartment 111 and the freezing compartment 112.

[0013] The refrigerator 100 may further comprise an ice making evaporator compartment 130 and a cabinet evaporator compartment 140, the ice making evaporator 131 may be mounted inside the ice making evaporator compartment 130, the ice making evaporator compartment 130 may be communicated with the ice making compartment 113 through an air duct, and an ice making fan may be provided inside the ice making evaporator compartment 130, and the ice making fan may operate to supply cold air generated by the ice making evaporator 131 to an interior of the ice making compartment 113. The cabinet evaporator 141 may be mounted inside the cabinet evaporator compartment 140, and the cabinet evaporator compartment 140 may be communicated with the refrigerating compartment 111 and the freezing compartment 112 to supply the cold air to the refrigerating compartment 111 and the freezing compartment 112.

[0014] The ice making evaporator 131 further has a corresponding defrosting unit the defrosting unit may comprise a defrosting heating wire provided on the ice making evaporator 131, and when the ice making evaporator 131 has excessive frost and a defrosting condition of the ice making evaporator 131 is satisfied, the defrosting heating wire may be turned on to defrost the ice making evaporator 131. A temperature sensor may be further mounted inside the ice making compartment 113, and the temperature sensor may detect a temperature change inside the ice making compartment 113.

[0015] FIG. 3 shows a refrigerator 100 control method according to a first embodiment of the present application. The refrigerator 100 control method comprises:

collecting working parameters of an ice making system;

when the working parameters meet a preset normal defrosting condition of an ice making evaporator 131, controlling a defrosting unit corresponding to the ice making evaporator 131 to be started; and

when information on an amount of ice in an ice bin 151 is detected to be full ice information, and when the working parameters meet a preset full ice defrosting condition of the ice making evaporator 131, controlling the defrosting unit corresponding to the ice making evaporator 131 to be started.

[0016] In the present embodiment, the ice making system may comprise an ice making device 150 and a refrigerating system corresponding to an ice making compartment 113, such as a compressor, the ice making evaporator 131, and an ice making fan. When the ice making evaporator 131 has excessive frost, in order not to affect running of the ice making evaporator 131, the defrosting unit corresponding to the ice making evaporator 131 is required to be started to defrost the ice making evaporator 131.

[0017] When the working parameters of the ice making system satisfy the preset normal defrosting condition, the ice making evaporator 131 may be determined to be required to be defrosted, and at this point, a defrosting instruction may be issued regardless of the amount of the ice in the ice bin 151. The working parameters of the ice making system may comprise a cumulative running time of the compressor after last defrosting of the ice making evaporator 131 is finished and/or a number of ice making times of the ice making device 150 after the last defrosting

of the ice making evaporator 131 is finished.

[0018] When the information on the amount of the ice in the ice bin 151 is detected to be the full ice information, since the amount of the ice in the ice bin 151 is large, ice cubes in the ice bin 151 may emit a large amount of cold energy, a temperature rise generated in a defrosting process of the ice making evaporator 131 does not cause a temperature of the ice making compartment 113 to be excessively high, and an influence on the ice cubes in the ice bin 151 is small; meanwhile, when the ice bin 151 is in a full ice state, the ice making device 150 does not perform an ice turning operation, such that the ice making device 150 does not immediately start a next ice making cycle, defrosting of the ice making evaporator 131 in the full ice state does not affect the ice making cycle, and therefore, this point is an optimal defrosting time. When the working parameters of the ice making system do not meet the preset normal defrosting condition, whether the working parameters of the ice making system meet the full ice defrosting condition or not can be judged, and when the full ice defrosting condition is met, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started, and the ice making evaporator 131 is defrosted in the full ice state, such that a negative effect caused by defrosting of the ice making evaporator 131 is minimized, and meanwhile, energy consumption can be saved.

[0019] Further, the situation that the working parameters meet the normal defrosting condition of the ice making evaporator 131 may comprise the following situation: the cumulative running time of the compressor after the last defrosting of the ice making evaporator 131 is finished is greater than or equal to a preset normal defrosting cycle of the ice making evaporator 131, or the number of ice making times of the ice making device 150 is greater than or equal to a preset number of normal defrosting ice making times of the ice making evaporator 131.

[0020] The situation that the working parameters meet the preset full ice defrosting condition may comprise the following situation: the cumulative running time of the compressor after the last defrosting of the ice making evaporator 131 is finished is greater than or equal to a preset full ice defrosting cycle of the ice making evaporator 131, or the number of ice making times of the ice making device 150 is greater than or equal to a preset number of full ice defrosting ice making times.

[0021] The normal defrosting cycle of the ice making evaporator 131 is greater than the full ice defrosting cycle, and the number of normal defrosting ice making times is greater than the number of full ice defrosting ice making times.

[0022] Certainly, the situation that the working parameters meet the normal defrosting condition of the ice making evaporator 131 may also comprise the following situations: the cumulative running time of the compressor after the last defrosting of the ice making evaporator 131 is finished is greater than or equal to the preset normal defrosting cycle of the ice making evaporator 131, and the number of ice making times of the ice making device 150 is greater than or equal to the preset number of normal defrosting ice making times of the ice making evaporator 131. The situation that the working parameters meet the preset full ice defrosting condition may comprise the following situations: the cumulative running time of the compressor after the last defrosting of the ice making evaporator 131 is finished is greater than or equal to the preset full ice defrosting cycle of the ice making evaporator 131, and the number of ice making times of the ice making device 150 is greater than or equal to the preset number of full ice defrosting ice making times.

[0023] As a specific example, when the normal defrosting cycle of the ice making evaporator 131 is 20 hours, the full ice defrosting cycle may be 15 hours, and when the cumulative running time of the compressor is detected to reach 20 hours after the last defrosting of the ice making evaporator 131 is finished, the ice making evaporator 131 may be determined to meet the normal defrosting condition regardless of the amount of the ice in the ice bin 151, and the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started. When the ice bin 151 is full of ice, whether the cumulative running time of the compressor is greater than or equal to 15 hours after the last defrosting of the ice making evaporator 131 is finished can be judged, and when the cumulative running time is greater than or equal to 15 hours, the ice making evaporator 131 may be determined to meet the full ice defrosting condition, and the defrosting unit corresponding to the ice making evaporator 131 may be controlled to be turned on in advance to defrost the ice making evaporator 131.

[0024] When the preset number of normal defrosting ice making times of the ice making evaporator 131 is 20, the preset number of full ice defrosting ice making times can be 15, and when the ice making device 150 is detected to make ice 20 times after the last defrosting is finished, whether the ice bin is in the full ice state or a non-full ice state, the ice making evaporator 131 can be determined to meet the normal defrosting condition, and a defrosting signal for the ice making evaporator 131 can be issued to control the defrosting unit corresponding to the ice making evaporator 131 to be started to defrost the ice making evaporator 131. When the received information on the amount of the ice in the ice bin 151 is the full ice information, whether the number of ice making times of the ice making device 150 after the last defrosting of the ice making evaporator 131 is finished is greater than or equal to 15 can be judged, and when the number is greater than or equal to 15, the ice making evaporator 131 can be determined to meet the full ice defrosting condition, and a defrosting signal for the ice making evaporator 131 may be issued to control the defrosting unit corresponding to the ice making evaporator 131 to be turned on in advance to start defrosting of the ice making evaporator 131.

[0025] In this way, when the ice bin 151 is full of ice, the ice making evaporator 131 can be defrosted in ad-

vance, such that the adverse effect caused by the defrosting of the ice making evaporator 131 is minimized, the temperature rise of the ice making compartment 113 caused by the defrosting of the ice making evaporator 131 is reduced, the energy consumption is reduced, and meanwhile, a risk of melting the ice cubes in the ice bin 151 can be reduced.

[0026] FIG. 4 shows a refrigerator 100 control method according to a second embodiment of the present application. The refrigerator 100 control method comprises:

collecting working parameters of an ice making system;

when the working parameters meet a preset normal defrosting condition of an ice making evaporator 131, judging whether an ice making compartment 113 is required to be precooled according to information on an amount of ice in an ice bin 151;

when the ice making compartment 113 is required to be precooled, controlling a refrigerating system to refrigerate the ice making compartment 113, and when a temperature of the ice making compartment 113 is monitored to be equal to or lower than a preset precooling temperature, controlling a defrosting unit corresponding to the ice making evaporator 131 to be started;

when the ice making compartment 113 is not required to be precooled, controlling the defrosting unit corresponding to the ice making evaporator 131 to be started;

when the information on the amount of the ice in the ice bin 151 is detected to be full ice information, and when the working parameters meet a preset full ice defrosting condition of the ice making evaporator 131, controlling the defrosting unit corresponding to the ice making evaporator 131 to be started.

[0027] The refrigerator control method according to the present embodiment is a further improvement of the refrigerator control method according to the first embodiment. The refrigerator 100 control method according to the present embodiment is different from the refrigerator 100 control method according to the first embodiment in that when the working parameters of the ice making system meet the preset normal defrosting condition of the ice making evaporator 131, whether the ice making compartment 113 is precooled is judged according to the information on the amount of the ice in the ice bin 151, and when the ice making compartment 113 is required to be precooled, the refrigerating system is controlled to be started to refrigerate the ice making compartment 113, and when the temperature of the ice making compartment 113 reaches the corresponding precooling temperature, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started, thus avoiding that due to the defrosting of the ice making evaporator 131, the temperature of the ice making compartment 113 is excessively high, ice cubes in the ice bin 151 melt, or an ice making cycle of an ice making device 150 is excessively long.

[0028] The precooling temperature may be a fixed temperature, or may be changed according to parameters affecting the temperature of the ice making compartment, such as working conditions of the ice making device 150, or the like, and the precooling temperature may be stored in a memory of the refrigerator 100 in advance.

[0029] As a specific example, when the working parameters of the ice making system meet the defrosting condition of the ice making evaporator 131, and when the ice making compartment is required to be precooled, the corresponding precooling temperature of the ice making compartment 113 may be obtained first, and the temperature of the ice making compartment 113 may be monitored; for example, a temperature sensor in the ice making compartment 113 may be controlled to detect the temperature of the ice making compartment 113, and certainly, the temperature sensor in the ice making compartment 113 may periodically detect the temperature in the ice making compartment 113 and upload and store the detected temperature into the memory of the refrigerator 100, and when the working parameters of the ice making system meet the defrosting condition of the ice making evaporator 131, the stored temperature of the ice making compartment 113 may be directly called.

[0030] When the precooling temperature is -8°C and the current temperature of the ice making compartment 113 is -3°C, the refrigerating system is controlled to refrigerate the ice making compartment 113, and when the temperature of the ice making compartment 113 is reduced to the precooling temperature of -8°C, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started to defrost the ice making evaporator 131. Certainly, when the current temperature of the ice making compartment 113 is lower than - 8°C, for example, -9°C, the ice making compartment 113 is not required to be refrigerated, and the defrosting unit corresponding to the ice making evaporator 131 can be directly started.

[0031] In this way, when the temperature of the ice making compartment 113 is -8°C, the ice making evaporator 131 is defrosted, and if the temperature of the ice making compartment 113 is increased by 5°C in the defrosting process, the temperature of the ice making compartment 113 is still -3°C after the defrosting of the ice making evaporator 131 is finished.

[0032] Thus, even when the temperature of the ice making compartment 113 is increased during the defrosting of the ice making evaporator 131, the temperature of the ice making compartment 113 is not excessively high, and the ice cubes stored in the ice bin 151 and a subsequent ice making process are not affected.

[0033] In one embodiment, the "judging whether an ice making compartment 113 is required to be precooled according to information on an amount of ice in an ice bin 151" comprises:

when the amount of the ice in the ice bin 151 is greater than or equal to a first preset value, determining that the ice making compartment 113 is not required to be precooled; and

when the amount of the ice in the ice bin 151 is less than the first preset value, determining that the ice making compartment 113 is required to be precooled.

[0034] When greater than the first preset value, the amount of the ice in the ice bin 151 is large, and at this point, a temperature rise generated in the defrosting process of the ice making evaporator 131 does not cause the temperature of the ice making compartment 113 to excessively rise, and also does not cause the ice cubes in the ice bin 151 to melt, such that when the amount of the ice in the ice bin 151 is large, since an influence of the defrosting of the ice making evaporator 131 on the temperature of the ice making compartment 113 is small, the defrosting unit can be directly started for defrosting without precooling, energy consumption is further saved, and noise caused by a compressor in the precooling process is avoided.

[0035] In another embodiment, the "judging whether an ice making compartment 113 is required to be precooled according to information on an amount of ice in an ice bin 151" comprises:

when the information on the amount of the ice in the ice bin is non-full ice information, determining that the ice making compartment 113 is not required to be precooled; and

when the information on the amount of the ice in the ice bin is the full ice information, determining that the ice making compartment 113 is required to be precooled.

[0036] Further, referring to FIG. 5, in the present embodiment, the refrigerator 100 control method further comprises:

when the ice making compartment 113 is required to be precooled, matching the corresponding precooling temperature according to the ice amount information.

[0037] An ice amount information-precooling temperature comparison table can be stored in the memory of the refrigerator 100, the precooling temperature can be in positive correlation with the amount of the ice in the ice bin 151, and the more the ice in the ice bin 151, the more the cold energy released by the ice cubes, the smaller the temperature rise of the ice making compartment 113 in the defrosting process of the ice making evaporator 131, and therefore, the higher the matched precooling temperature.

[0038] As a specific example, a full ice amount of the ice bin 151 is Q, and when the current temperature of the ice making compartment 113 is -3°C, and a current ice amount of the ice bin 151 is Q, the temperature of the ice making compartment 113 may be increased by 2°C during the defrosting of the ice making evaporator 131, and after the defrosting is finished, the temperature of the ice making compartment 113 is -1°C, and the ice cubes in the ice bin 151 may not melt, such that defrosting may be performed without precooling the ice making compartment. When the current ice amount of the ice bin 151 is 0.8Q, the temperature of the ice making compartment 113 may be increased by 4°C in the defrosting process of the ice making evaporator 131, and at this point, the ice making compartment 113 is required to be precooled before defrosting, and the precooling temperature may be -5°C; when the ice amount of the ice bin 151 is 0.6Q, the defrosting of the ice making evaporator 131 may cause the temperature of the ice making compartment 113 to rise by 6°C, and therefore, the corresponding precooling temperature may be -7°C; in this way, the temperature of the ice making compartment 113 can be guaranteed to be below 0°C after the defrosting of the ice making evaporator 131 is finished, the ice cubes in the ice bin 151 cannot melt, and ice making by the ice making device after the defrosting is finished cannot be influenced.

[0039] In the present embodiment, the "matching the corresponding precooling temperature according to the ice amount information" may comprise:

when the current ice amount is greater than or equal to a second preset value, determining that the precooling temperature is a first precooling temperature;

otherwise, determining that the precooling temperature is a second precooling temperature;

the second preset value being smaller than the first preset value, and the second precooling temperature being lower than the first precooling temperature.

[0040] As a specific example, when the full ice amount of the ice bin 151 is Q, the first preset value may be 0.8Q, and the second preset value may be 0.5Q; when the current ice amount of the ice bin 151 is greater than or equal to the first preset value of 0.8Q, the ice making compartment 113 is not required to be precooled, and the defrosting unit corresponding to the ice making evaporator 131 may be directly started to defrost the ice making evaporator 131; when the current ice amount of the ice bin 151 is less than the first preset value of 0.8Q and greater than or equal to the second preset value of 0.5Q, the corresponding precooling temperature of the ice making compartment 113 may be T1, and at this point, when the temperature of the ice making compartment 113 is greater than T1, the refrigerating system may be turned on first to precool the ice making compartment 113, and when the temperature of the ice making compartment 113 is lowered to T1, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started to defrost the ice making evaporator 131; when the current ice amount of the ice bin 151 is less than the

second preset value of 0.5Q, the corresponding precooling temperature of the ice making compartment 113 may be T2, and T2 is less than T1 to ensure that the ice cubes in the ice bin 151 in the ice making compartment 113 are not affected, and at this point, when the temperature of the ice making compartment 113 is greater than T2, the refrigerating system may be turned on first to precool the ice making compartment 113, and when the temperature of the ice making compartment 113 is lowered to T2, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started to defrost the ice making evaporator 131.

[0041] Therefore, whether the ice making compartment 113 is precooled and a proper precooling temperature is matched can be judged according to the current ice amount of the ice bin 151, the energy consumption is reduced, a defrosting efficiency is improved, a negative influence on the ice making device 150 caused by the excessively high temperature of the ice making compartment 113 is avoided, and meanwhile, the precooling operation can be reasonably controlled, excessive precooling is avoided, and the energy consumption is reduced.

[0042] FIG. 6 shows a refrigerator 100 control method according to a third embodiment of the present application. The refrigerator 100 control method comprises:

collecting working parameters of an ice making system;

when the working parameters meet a preset normal defrosting condition of an ice making evaporator 131, or when information on an amount of ice in an ice bin 151 is detected to be full ice information and the working parameters are detected to meet a preset full ice defrosting condition of the ice making evaporator 131, controlling a refrigerating system to refrigerate an ice making compartment 113; and

when a temperature of the ice making compartment 113 reaches a precooling temperature, controlling a defrosting unit corresponding to the ice making evaporator 131 to be started.

[0043] The refrigerator 100 control method according to the present embodiment is different from the refrigerator 100 control method according to the second embodiment in that when the ice bin 151 is full of ice, the refrigerating system is controlled to cool the ice making compartment 113 to the precooling temperature, and then, the defrosting unit corresponding to the ice making evaporator 131 is controlled to start defrosting. In this way, an excessively high temperature of the ice making compartment 113 in a full ice state caused by an abnormal condition may be further prevented. When in the full ice state, a user opens a refrigerating door 121 or an ice making door for a long time, which causes the temperature of the ice making compartment 113 to be excessively high, and when the ice making evaporator 131 is detected to meet the full ice defrosting condition, the corresponding defrosting unit is directly started to defrost the ice making evaporator 131, which may further increase the temperature in the ice making compartment 113, so as to melt ice cubes in the ice bin 151. Therefore, the ice making compartment 113 can be precooled when the ice is full, and then, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started.

[0044] Further, referring to FIG. 7, in the present embodiment, the refrigerator 100 control method further comprises:

matching a corresponding precooling temperature according to the ice amount information for the ice bin 151.

[0045] The precooling temperature may be positively correlated with a current ice amount of the ice bin 151, and the larger the current ice amount of the ice bin 151, the higher the corresponding precooling temperature.

[0046] Specifically, a full ice amount of the ice bin 151 is Q, and when the ice bin 151 is full of ice, the precooling temperature may be T1, and when the ice bin 151 is not full of ice, and the ice amount is greater than or equal to a preset value, such as 0.5Q, the corresponding precooling temperature may be T2, and when the ice amount of the ice bin 151 is less than the preset value, such as 0.5Q, the corresponding precooling temperature may be T3, T1 is greater than T2, and T2 is greater than T3.

[0047] When the temperature of the ice making compartment 113 is lower than or equal to the corresponding precooling temperature, the defrosting unit corresponding to the ice making evaporator 131 may be directly started, and when the temperature of the ice making compartment 113 is higher than the corresponding precooling temperature, the refrigerating system is started to refrigerate the ice making compartment 113, and when the temperature of the ice making compartment 113 reaches the corresponding precooling temperature, the defrosting unit corresponding to the ice making evaporator 131 is controlled to be started.

[0048] Thus, the precooling temperature can be controlled according to the ice amount of the ice bin 151, such that insufficient precooling or excessive precooling can be prevented, a temperature in the ice bin 151 can be prevented from being excessively low, and meanwhile, energy consumption can be saved.

[0049] Referring to FIG. 8, an embodiment of the present application further provides a refrigerator 100, comprising a memory 102 and a processor 101, wherein the memory 102 and the processor 101 are communicatively connected through a communication bus 104. The memory 102 stores a computer program operable on the processor 101, and the processor 101 implements the steps of the refrigerator control method according to the above embodiment when executing the computer program. The refrigerator 100 further comprises a communication interface 103 connected with the communication bus 104 and configured to be communicated with other apparatuses within the refrigerator 100.

[0050] An embodiment of the present application further provides a computer-readable storage medium having a computer program stored thereon, the computer

program, when executed by a processor, implementing the steps in the refrigerator control method according to the above embodiment.

[0051] Therefore, in summary, in the refrigerator control method according to the present application, whether the working parameters of the ice making system meet the full ice defrosting condition is actively judged when the ice bin is in the full ice state, and when the working parameters meet the full ice defrosting condition, the ice making evaporator is defrosted in advance in the full ice state, such that the influence of the defrosting of the ice making evaporator can be minimized, and meanwhile, the energy consumption can be reduced.

[0052] It should be understood that although the present specification is described based on embodiments, not every embodiment contains only one independent technical solution. Such a narration way of the present specification is only for the sake of clarity. Those skilled in the art should take the present specification as an entirety. The technical solutions in the respective embodiments may be combined properly to form other embodiments which may be understood by those skilled in the art.

[0053] A series of the detailed descriptions set forth above is merely specific description of feasible embodiments of the present application, and is not intended to limit the protection scope of the present application. Equivalent embodiments or modifications made within the spirit of the present application shall fall within the protection scope of the present application.

Claims

1. A refrigerator control method, comprising:

   collecting working parameters of an ice making system;
   when the working parameters meet a preset normal defrosting condition of an ice making evaporator, controlling a defrosting unit corresponding to the ice making evaporator to be started; and
   when information on an amount of ice in an ice bin is detected to be full ice information, and when the working parameters meet a preset full ice defrosting condition of the ice making evaporator, controlling the defrosting unit corresponding to the ice making evaporator to be started.

2. The refrigerator control method according to claim 1, wherein the working parameters comprise a cumulative running time of a compressor and/or a number of ice making times of an ice making device after last defrosting of the ice making evaporator is finished.

3. The refrigerator control method according to claim 2, wherein the situation that the working parameters meet the preset normal defrosting condition comprises the following situations:

   the cumulative running time of the compressor after the last defrosting of the ice making evaporator is finished reaches a preset normal defrosting cycle of the ice making evaporator, and/or the number of ice making times of the ice making device reaches a preset number of normal defrosting ice making times;
   the situation that the working parameters meet the preset full ice defrosting condition comprises the following situations:

   the cumulative running time of the compressor after the last defrosting of the ice making evaporator is finished is greater than or equal to a preset full ice defrosting cycle of the ice making evaporator, and/or the number of ice making times of the ice making device is greater than or equal to a preset number of full ice defrosting ice making times;
   the normal defrosting cycle of the ice making evaporator is greater than the full ice defrosting cycle, and the number of normal defrosting ice making times is greater than the number of full ice defrosting ice making times.

4. A refrigerator control method, comprising:

   collecting working parameters of an ice making system;
   when the working parameters meet a preset normal defrosting condition of an ice making evaporator, judging whether an ice making compartment is required to be precooled according to information on an amount of ice in an ice bin;
   when the ice making compartment is required to be precooled, controlling a refrigerating system to refrigerate the ice making compartment, and when a temperature of the ice making compartment is monitored to be equal to or lower than a precooling temperature, controlling a defrosting unit corresponding to the ice making evaporator to be started;
   when the ice making compartment is not required to be precooled, controlling the defrosting unit corresponding to the ice making evaporator to be started; and
   when information on an amount of ice in an ice bin is detected to be full ice information, and when the working parameters meet a preset full ice defrosting condition of the ice making evaporator, controlling the defrosting unit corre-

sponding to the ice making evaporator to be started.

5. The refrigerator control method according to claim 4, wherein the "judging whether an ice making compartment is required to be precooled according to information on an amount of ice in an ice bin" comprises:

when the information on the amount of the ice is non-full ice information, determining that the ice making compartment is required to be precooled; and
when the information on the amount of the ice is full ice information, determining that the ice making compartment is not required to be precooled.

6. The refrigerator control method according to claim 4, wherein the "judging whether an ice making compartment is required to be precooled according to information on an amount of ice in an ice bin" comprises:

when the amount of the ice in the ice bin is greater than or equal to a first preset value, determining that the ice making compartment is not required to be precooled; and
when the amount of the ice in the ice bin is less than the first preset value, determining that the ice making compartment is required to be precooled.

7. The refrigerator control method according to claim 4, further comprising:
when the ice making compartment is required to be precooled, matching the corresponding precooling temperature according to the ice amount information.

8. The refrigerator control method according to claim 4, wherein the working parameters comprise a cumulative running time of a compressor and/or a number of ice making times of an ice making device after last defrosting of the ice making evaporator is finished.

9. The refrigerator control method according to claim 8, wherein the situation that the working parameters meet the preset normal defrosting condition comprises the following situations:

the cumulative running time of the compressor after the last defrosting of the ice making evaporator is finished reaches a preset normal defrosting cycle of the ice making evaporator, and/or the number of ice making times of the ice making device reaches a preset number of normal defrosting ice making times;
the situation that the working parameters meet the preset full ice defrosting condition comprises the following situations:

the cumulative running time of the compressor after the last defrosting of the ice making evaporator is finished is greater than or equal to a preset full ice defrosting cycle of the ice making evaporator, and/or the number of ice making times of the ice making device is greater than or equal to a preset number of full ice defrosting ice making times;
the normal defrosting cycle of the ice making evaporator is greater than the full ice defrosting cycle, and the number of normal defrosting ice making times is greater than the number of full ice defrosting ice making times.

10. A refrigerator control method, comprising:

collecting working parameters of an ice making system;
when the working parameters meet a preset normal defrosting condition, or when information on an amount of ice in an ice bin is detected to be full ice information and the working parameters are detected to meet a preset full ice defrosting condition, controlling a refrigerating system to refrigerate an ice making compartment; and
when a temperature of the ice making compartment is monitored to be lower than or equal to a precooling temperature, controlling a defrosting unit corresponding to the ice making evaporator to be started.

11. The refrigerator control method according to claim 10, comprising:
matching a corresponding precooling temperature according to the ice amount information for the ice bin.

12. The refrigerator control method according to claim 10, wherein the working parameters comprise a cumulative running time of a compressor and/or a number of ice making times of an ice making device after last defrosting of the ice making evaporator is finished.

13. The refrigerator control method according to claim 10, wherein the situation that the working parameters meet the preset normal defrosting condition comprises the following situations:

the cumulative running time of the compressor after the last defrosting of the ice making evap-

orator is finished reaches a preset normal defrosting cycle of the ice making evaporator, and/or the number of ice making times of the ice making device reaches a preset number of normal defrosting ice making times;
the situation that the working parameters meet the preset full ice defrosting condition comprises the following situations:

the cumulative running time of the compressor after the last defrosting of the ice making evaporator is finished is greater than or equal to a preset full ice defrosting cycle of the ice making evaporator, and/or the number of ice making times of the ice making device is greater than or equal to a preset number of full ice defrosting ice making times;
the normal defrosting cycle of the ice making evaporator is greater than the full ice defrosting cycle, and the number of normal defrosting ice making times is greater than the number of full ice defrosting ice making times.

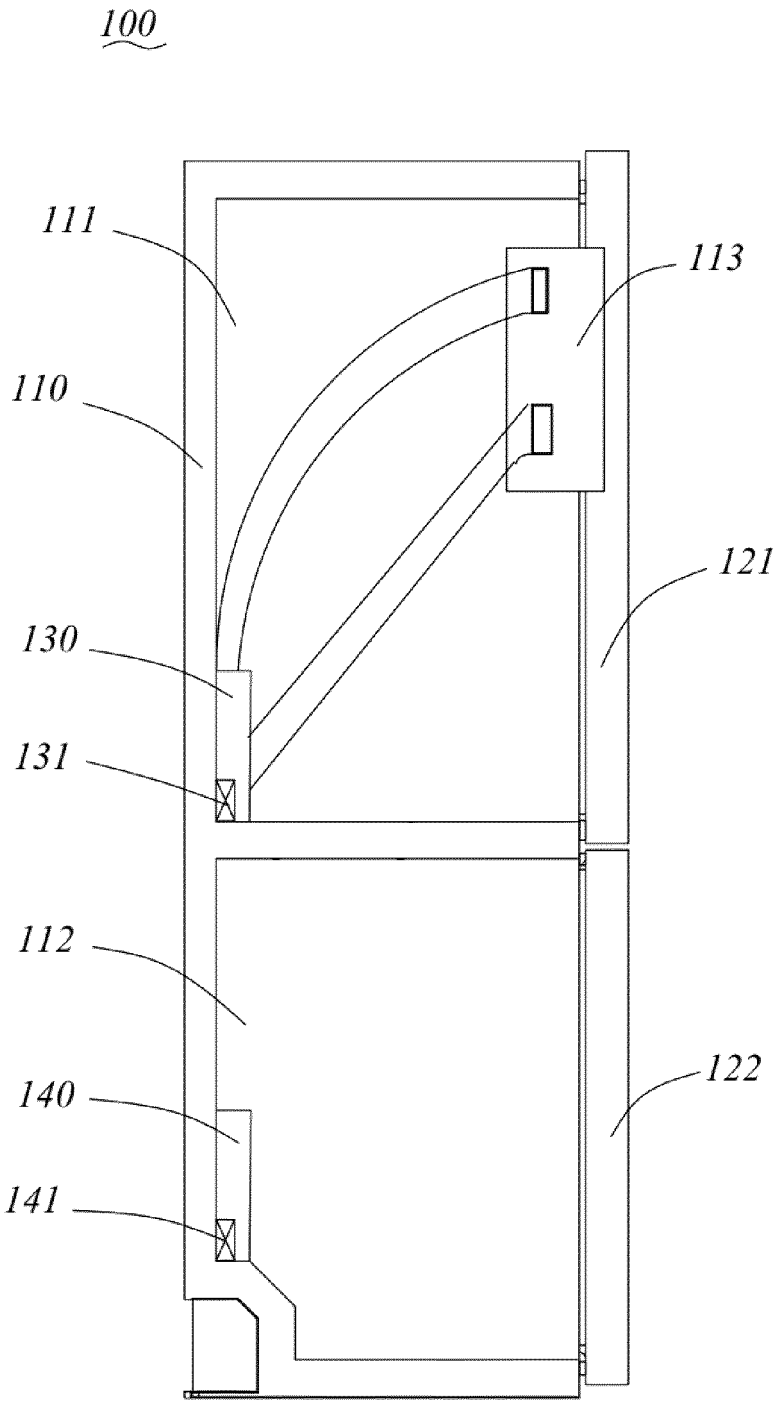

FIG.1

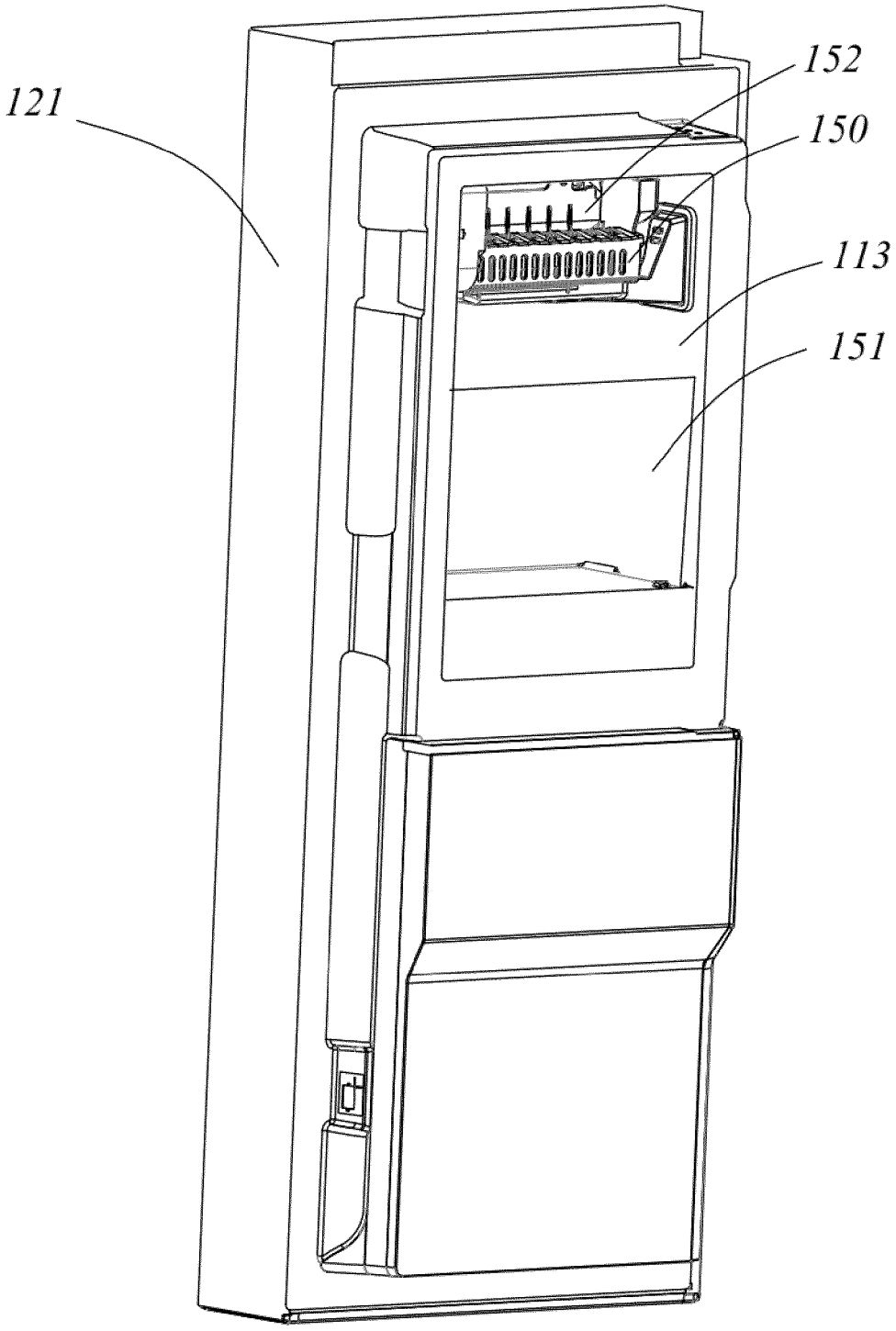

FIG.2

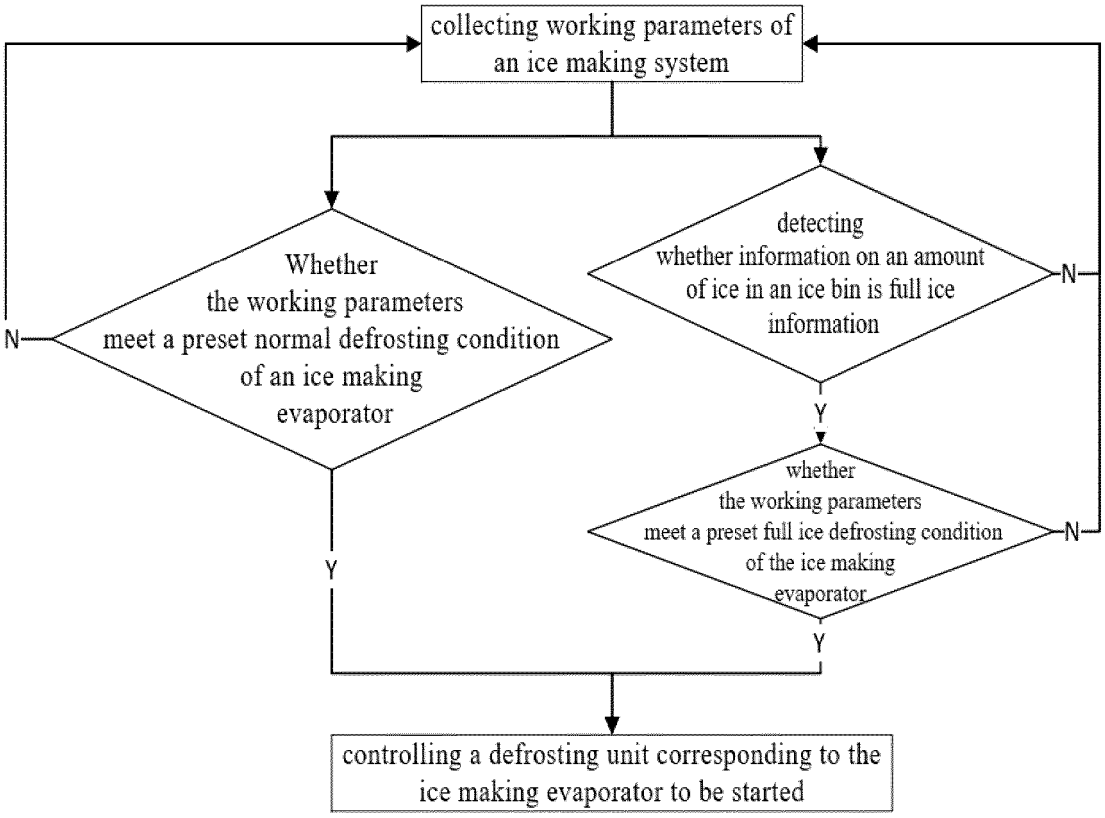
collecting working parameters of an ice making system
Whether the working parameters meet a preset normal defrosting condition of an ice making evaporator
N
Y
detecting whether information on an amount of ice in an ice bin is full ice information
N
Y
whether the working parameters meet a preset full ice defrosting condition of the ice making evaporator
N
Y
controlling a defrosting unit corresponding to the ice making evaporator to be started

FIG.3

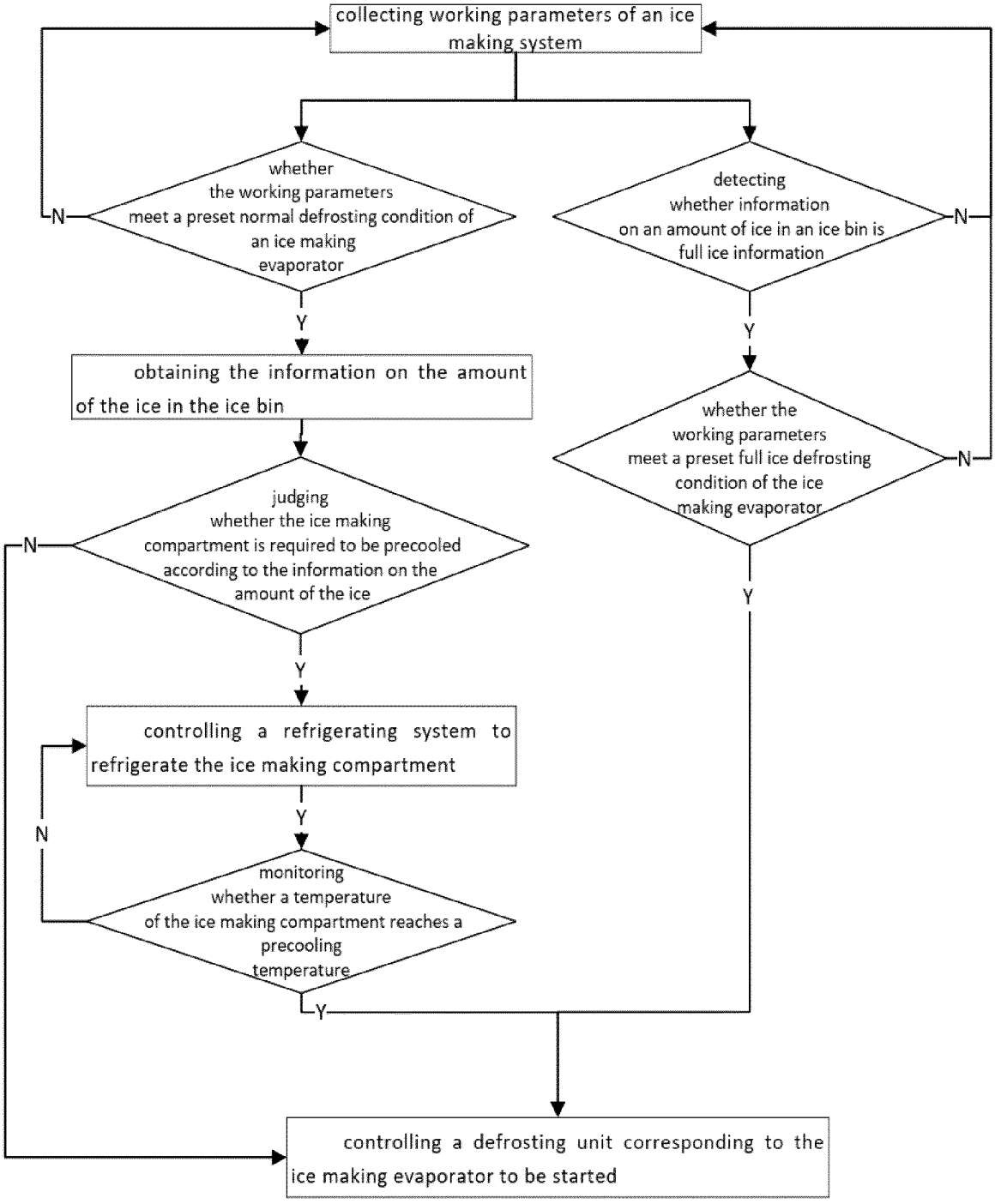
collecting working parameters of an ice making system
whether the working parameters meet a preset normal defrosting condition of an ice making evaporator
N
Y
detecting whether information on an amount of ice in an ice bin is full ice information
N
Y
obtaining the information on the amount of the ice in the ice bin
whether the working parameters meet a preset full ice defrosting condition of the ice making evaporator
N
Y
judging whether the ice making compartment is required to be precooled according to the information on the amount of the ice
N
Y
controlling a refrigerating system to refrigerate the ice making compartment
Y
N
monitoring whether a temperature of the ice making compartment reaches a precooling temperature
Y
controlling a defrosting unit corresponding to the ice making evaporator to be started

FIG.4

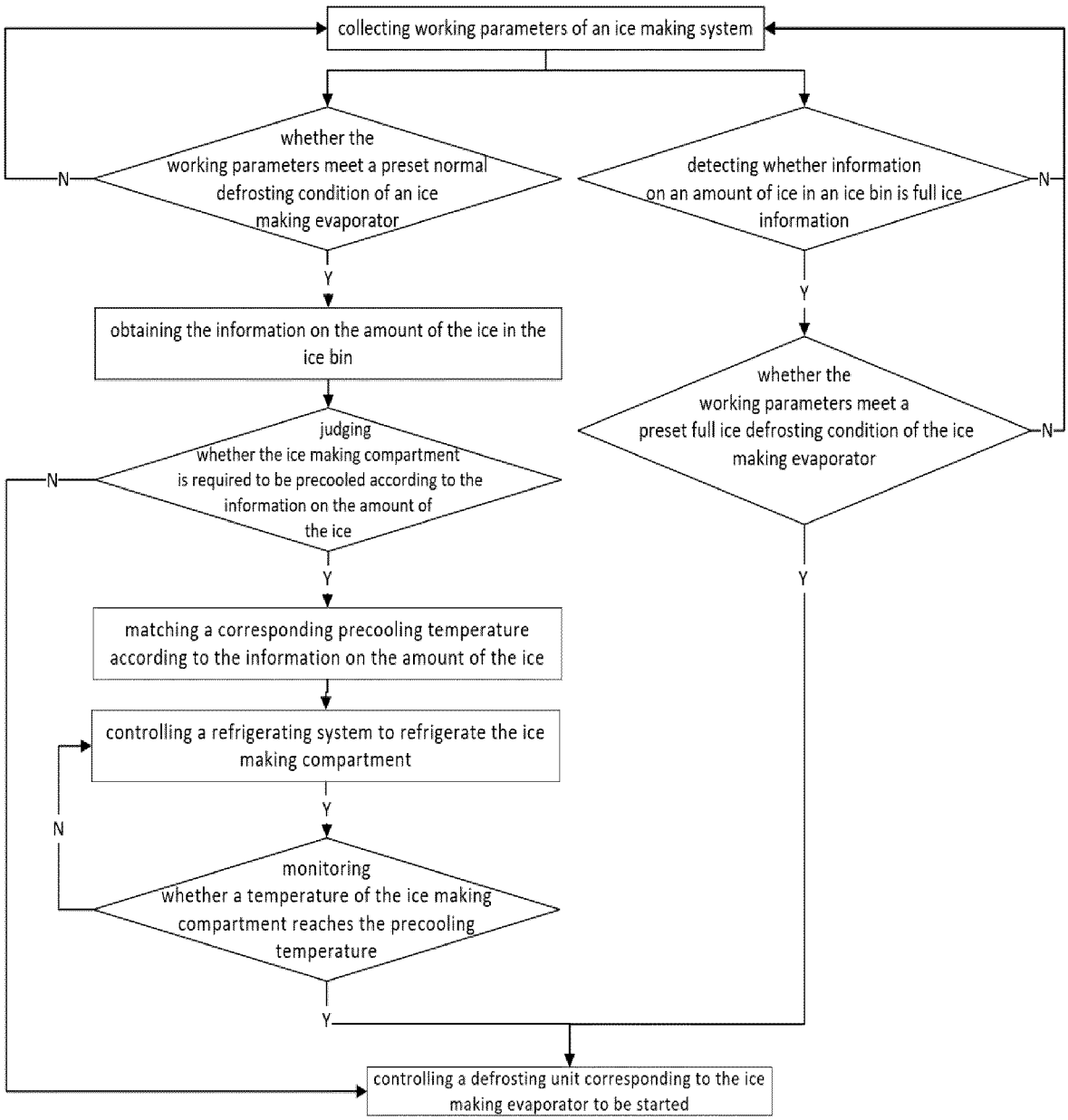
collecting working parameters of an ice making system
whether the working parameters meet a preset normal defrosting condition of an ice making evaporator
N
Y
obtaining the information on the amount of the ice in the ice bin
judging whether the ice making compartment is required to be precooled according to the information on the amount of the ice
N
Y
matching a corresponding precooling temperature according to the information on the amount of the ice
controlling a refrigerating system to refrigerate the ice making compartment
N
Y
monitoring whether a temperature of the ice making compartment reaches the precooling temperature
Y
detecting whether information on an amount of ice in an ice bin is full ice information
N
Y
whether the working parameters meet a preset full ice defrosting condition of the ice making evaporator
N
Y
controlling a defrosting unit corresponding to the ice making evaporator to be started

FIG.5

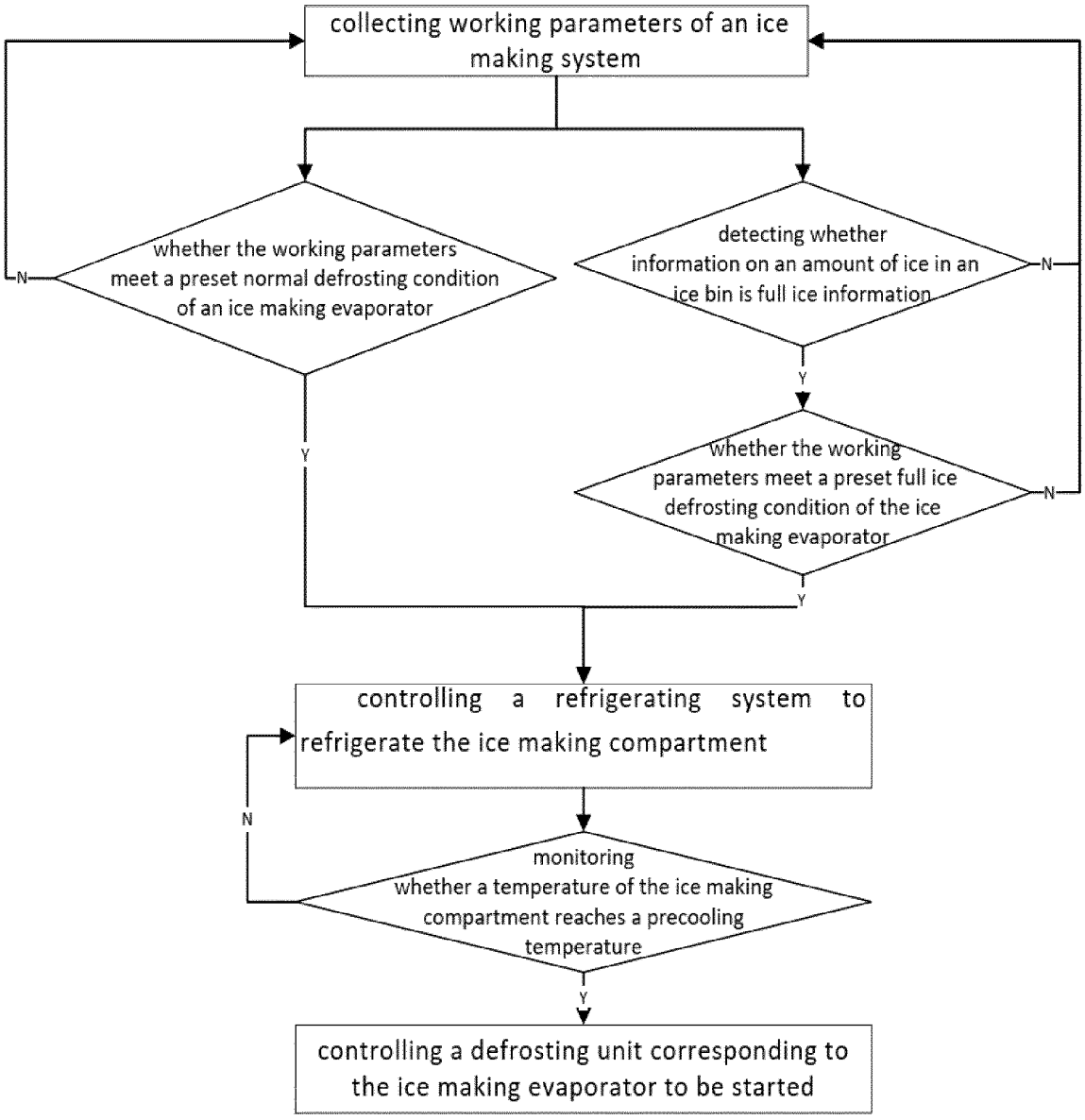
collecting working parameters of an ice making system
whether the working parameters meet a preset normal defrosting condition of an ice making evaporator
N
Y
detecting whether information on an amount of ice in an ice bin is full ice information
N
Y
whether the working parameters meet a preset full ice defrosting condition of the ice making evaporator
N
Y
controlling a refrigerating system to refrigerate the ice making compartment
monitoring whether a temperature of the ice making compartment reaches a precooling temperature
N
Y
controlling a defrosting unit corresponding to the ice making evaporator to be started

FIG.6

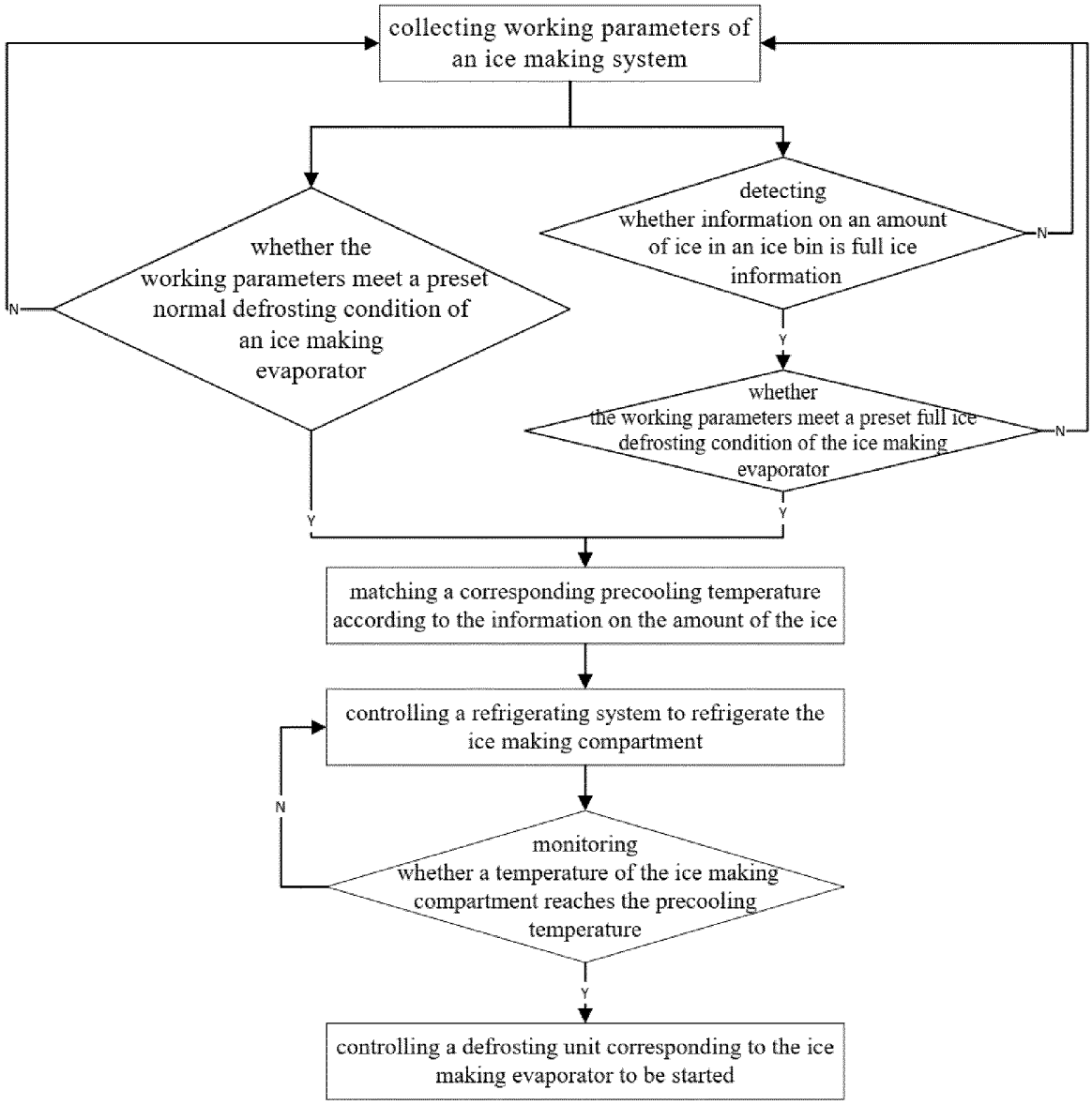
collecting working parameters of an ice making system
whether the working parameters meet a preset normal defrosting condition of an ice making evaporator
detecting whether information on an amount of ice in an ice bin is full ice information
whether the working parameters meet a preset full ice defrosting condition of the ice making evaporator
N
Y
matching a corresponding precooling temperature according to the information on the amount of the ice
controlling a refrigerating system to refrigerate the ice making compartment
monitoring whether a temperature of the ice making compartment reaches the precooling temperature
controlling a defrosting unit corresponding to the ice making evaporator to be started

FIG.7

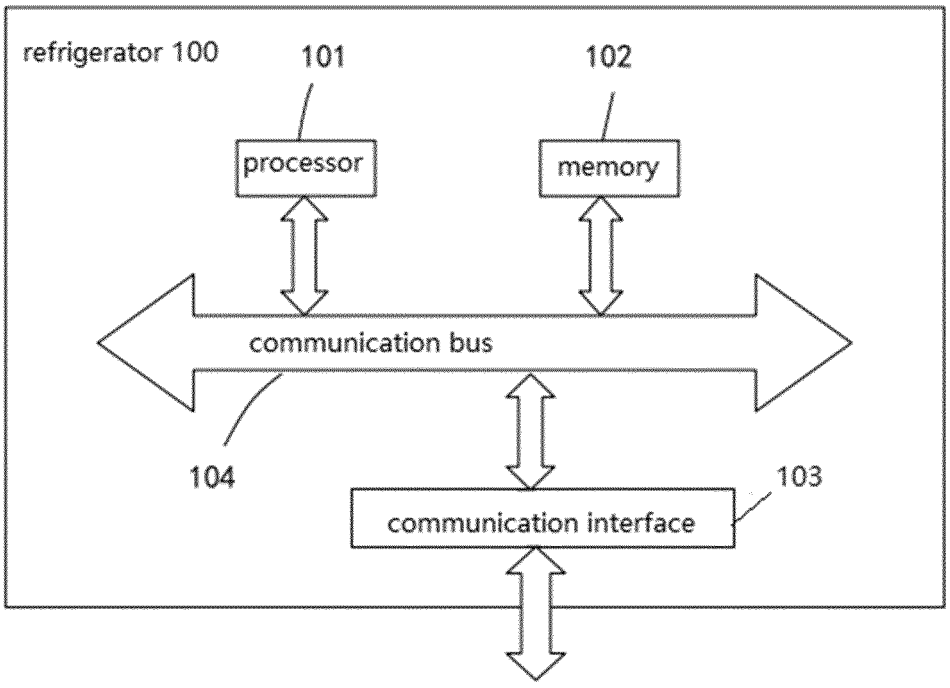
refrigerator 100
101
102
processor
memory
communication bus
104
103
communication interface

FIG.8

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2022/115366

A. CLASSIFICATION OF SUBJECT MATTER

F25D 29/00(2006.01)i; F25D 21/00(2006.01)i; F25D 23/12(2006.01)i; F25C 1/00(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)

F25C; F25D

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; CNKI; VEN; WOTXT; USTXT; EPTXT: 冰箱, 制冷, 制冰, 蒸发器, 除霜, 化霜, 融霜, 加热, 储冰, 满, 冰量, refrigerator, refrigeration, ice maker, evaporator, defrost, heat, store, full, amount

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 110160308 A (HEFEI MIDEA REFRIGERATOR CO., LTD. et al.) 23 August 2019 (2019-08-23) description, paragraphs [0052]-[0069], and figure 1	10-13
Y	CN 107062771 A (TCL HOME APPLIANCES (HEFEI) CO., LTD.) 18 August 2017 (2017-08-18) description, paragraphs [0021]-[0036], and figure 1	10-13
A	CN 110160308 A (HEFEI MIDEA REFRIGERATOR CO., LTD. et al.) 23 August 2019 (2019-08-23) entire document	1-9
A	CN 107062771 A (TCL HOME APPLIANCES (HEFEI) CO., LTD.) 18 August 2017 (2017-08-18) entire document	1-9
A	CN 109631487 A (HEFEI MIDEA REFRIGERATOR CO., LTD. et al.) 16 April 2019 (2019-04-16) entire document	1-13

☐ 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
01 November 2022	**16 November 2022**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088, China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2022/115366

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 110160308 A	23 August 2019	None	
CN 107062771 A	18 August 2017	CN 107062771 B	17 September 2019
CN 109631487 A	16 April 2019	WO 2020140238 A1	09 July 2020
		CA 3124733 A1	09 July 2020
		AU 2019418359 A1	15 July 2021
		EP 3882546 A1	22 September 2021
		EP 3882546 A4	17 November 2021
		US 2022099354 A1	31 March 2022

Form PCT/ISA/210 (patent family annex) (January 2015)