

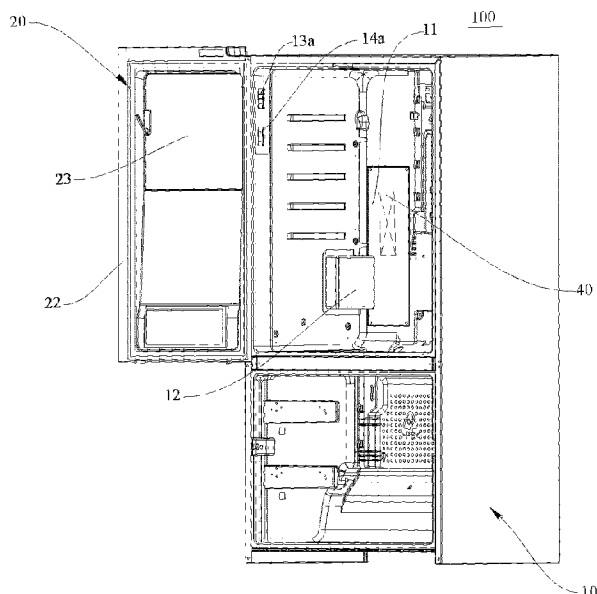


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(54) Title: REFRIGERATOR INTEGRATED WITH ICE MAKER



(57) **Abrégé/Abstract:**

Disclosed is a refrigerator (100) integrated with an ice maker, the refrigerator (100) includes a refrigerator cabinet (10), a refrigerator door (20), an ice maker (30), an ice-making evaporator (40) and a blower (50); an air return duct (14), a blower chamber (12), an ice-making evaporation chamber (11) and an air supply duct (13) are sequentially connected; a free end of the air supply duct (13) is formed as an air supply port (13a) and a free end of the air return duct (14) is formed as an air return port (14a); the refrigerator door (20) is provided with an ice-making chamber (21), the ice-making chamber (21) is provided with an air inlet (211) and an air outlet (212), the air inlet (211) is in communication with the air supply port (13a) and the air outlet (212) is in communication with the air return port (14a) when the refrigerator door (20) is closed; the refrigerator door (20) is pivotally connected to the side wall of the refrigerator cabinet (10) where the blower chamber (12) is located.

ABSTRACT

Disclosed is a refrigerator (100) integrated with an ice maker, the refrigerator (100) includes a refrigerator cabinet (10), a refrigerator door (20), an ice maker (30), an ice-making evaporator (40) and a blower (50); an air return duct (14), a blower chamber (12), an ice-making evaporation chamber (11) and an air supply duct (13) are sequentially connected; a free end of the air supply duct (13) is formed as an air supply port (13a) and a free end of the air return duct (14) is formed as an air return port (14a); the refrigerator door (20) is provided with an ice-making chamber (21), the ice-making chamber (21) is provided with an air inlet (211) and an air outlet (212), the air inlet (211) is in communication with the air supply port (13a) and the air outlet (212) is in communication with the air return port (14a) when the refrigerator door (20) is closed; the refrigerator door (20) is pivotally connected to the side wall of the refrigerator cabinet (10) where the blower chamber (12) is located.

REFRIGERATOR INTEGRATED WITH ICE MAKER

CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims priority to Chinese Patent Application No. 201711185506.4 entitled “Refrigerator Integrated with Ice Maker” filed November 23, 2017, by Hefei Hualing Co., Ltd., Hefei Midea Refrigerator Co., Ltd., and Midea Group Co., Ltd.

FIELD OF THE INVENTION

The disclosure relates to the field of household appliances, in particular to a refrigerator integrated with an ice maker.

BACKGROUND OF THE INVENTION

In the related art, generally, cold air required by an ice maker on a refrigerator is provided by a freezing evaporator arranged at the lower part of the refrigerator, while the ice maker is arranged at the upper part of the refrigerator, and thus a long air duct is required to transmit the cold air from the freezing evaporator to the ice maker, which not only causes consumption of the cold, but also requires a high speed blower to transmit air, resulting in a great noise of the refrigerator. In addition, the air blown from the freezing evaporator may bring peculiar smell along with it because it passes through the freezing chamber, as a result, the ice cubes are poor in taste and unhygienic.

SUMMARY OF THE INVENTION

An objective of the present disclosure is to solve at least one of the technical problems existing in the prior art by providing a refrigerator integrated with an ice maker, which is reasonable in space utilization and good in the ice-making effect.

The refrigerator integrated with the ice maker according to an embodiment of the disclosure comprises: a refrigerator cabinet, a refrigerator door, an ice maker, an ice-making evaporator and a blower, wherein a refrigerating chamber and a freezing chamber are defined in the refrigerator cabinet, a rear wall of the refrigerator cabinet is provided with an ice-making evaporation chamber,

one of a left side wall and a right side wall of the refrigerator cabinet is provided with a blower chamber, the ice-making evaporation chamber is located on the back of the refrigerating chamber, an air supply duct and an air return duct are further provided in the refrigerator cabinet; the air return duct, the blower chamber, the ice-making evaporation chamber and the air supply duct are sequentially connected, a free end of the air supply duct is formed as an air supply port and a free end of the air return duct is formed as an air return port, the refrigerator door is provided with an ice-making chamber provided with an air inlet and an air outlet, the air inlet is in communication with the air supply port and the air outlet is in communication with the air return port when the refrigerator door is closed, the refrigerator door is pivotally connected to the side wall of the refrigerator cabinet where the blower chamber is located, the ice maker is located in the ice-making chamber, the ice-making evaporator is located in the ice-making evaporation chamber, and the blower is located in the blower chamber.

According to the refrigerator integrated with the ice maker, the refrigerator door is provided with the ice-making chamber for installing the ice maker, the ice-making evaporation chamber is provided on the rear wall of the refrigerator cabinet for installing the ice-making evaporator to cool the ice maker, the blower chamber is provided on the side wall of the refrigerator cabinet for installing the blower and guiding the low-temperature airflow generated by the ice-making evaporator into the ice-making chamber through the air supply duct to provide the low-temperature airflow for the ice maker, and then the ice maker makes ice.

In this manner, the space arrangement of the refrigerator is more reasonable, the length of the air duct is reduced, the cold loss of the low-temperature airflow generated by the ice-making evaporator is less, hence the ice-making efficiency of the ice maker is improved, the probability that the low-temperature airflow carries peculiar smell can be reduced, and the ice-making effect of the ice maker is better.

Additional aspects and advantages of the disclosure will be set forth in part in the description which follows, and will in part be apparent from the description, or may be learned by implementing the disclosure.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic view of a refrigerator according to an embodiment of the present disclosure from an angle;

FIG. 2 is a schematic view of the refrigerator according to an embodiment of the present disclosure from another angle;

FIG. 3 is a schematic view of the refrigerator according to an embodiment of the present disclosure from yet another angle;

FIG. 4 is a schematic view of a refrigerator door of the refrigerator according to an embodiment of the present disclosure;

FIG. 5 is a schematic view of an air supply duct, an air return duct, a blower, an ice-making evaporator, and the refrigerator door of the refrigerator according to an embodiment of the present disclosure from an angle;

FIG. 6 is a schematic view of the air supply duct, the air return duct, the blower, the ice-making evaporator, and the refrigerator door of the refrigerator according to an embodiment of the present disclosure from another angle;

FIG. 7 is a schematic view of the air supply duct and the air return duct according to an embodiment of the present disclosure;

FIG. 8 is a schematic view of an air duct assembly of the refrigerator according to an embodiment of the present disclosure;

FIG. 9 is a schematic view of a door cover plate of the refrigerator according to an embodiment of the present disclosure;

FIG. 10 is a sectional view of FIG. 9 along line A-A;

FIG. 11 is a sectional view of FIG. 9 along line B-B;

FIG. 12 is an exploded schematic view of an inner container of a cabinet body of the refrigerator according to an embodiment of the present disclosure; and

FIG. 13 is an exploded schematic view of the refrigerator cabinet of the refrigerator according to an embodiment of the present disclosure.

DETAILED DESCRIPTION OF THE INVENTION

Reference is now be made in detail to the embodiments of the present disclosure, examples of which are illustrated in the accompanying drawings, wherein like or similar reference numerals refer to the like or similar elements or elements having the like or similar function throughout the drawings. The embodiments described below by reference to the drawings are exemplary, intended to be illustrative of the disclosure and not to be construed as limiting the disclosure.

A refrigerator 100 integrated with an ice maker according to an embodiment of the present disclosure will now be described with reference to FIGS. 1 to 13.

As shown in FIGS. 1 to 4, the refrigerator 100 integrated with the ice maker according to an embodiment of the present disclosure includes a refrigerator cabinet 10, a refrigerator door 20, an ice maker 30, an ice-making evaporator 40 and a blower 50.

Wherein a refrigerating chamber and a freezing chamber are defined in the refrigerator cabinet 10, a rear wall of the refrigerator cabinet is provided with an ice-making evaporation chamber 11, one of a left side wall and a right side wall of the refrigerator cabinet 10 is provided with a blower chamber 12, the ice-making evaporation chamber 11 is located on the back of the refrigerating chamber, an air supply duct 13 and an air return duct 14 are further provided in the refrigerator cabinet 10; the air return duct 14, the blower chamber 12, the ice-making evaporation chamber 11 and the air supply duct 13 are sequentially connected, a free end of the air supply duct 13 is formed as an air supply port 13a and a free end of the air return duct 14 is formed as an air return port 14a, the refrigerator door 20 is provided with an ice-making chamber 21 provided with an air inlet 211 and an air outlet 212, the air inlet 211 is in communication with the air supply port 13a and the air outlet 212 is in communication with the air return port 14a when the refrigerator door 20 is closed, the refrigerator door 20 is pivotally connected to the side wall of the refrigerator cabinet 10 where the blower chamber 12 is located, the ice maker 30 is located in the ice-making chamber 21, the ice-making evaporator 40 is located in the ice-making evaporation chamber 11, and the blower 50 is located in the blower chamber 12.

According to the refrigerator 100 integrated with the ice maker of the embodiment of the present disclosure, the refrigerator door 20 is provided with the refrigerating chamber 21 for installing the ice maker 30, and the ice-making evaporation chamber 11 is provided on the rear

wall of the refrigerator cabinet 10 for installing the ice-making evaporator 40 to provide a low-temperature airflow for the ice maker 30, and the blower chamber 12 is provided on the side wall of the refrigerator cabinet 10 for installing the blower 50 and guiding the low-temperature airflow generated by the ice-making evaporator 40 into the ice-making chamber 21 through the air supply duct 13 to provide the low-temperature airflow for the ice maker 30, and then the ice maker 30 makes ice.

In this manner, the space arrangement of the refrigerator is more reasonable, the refrigerator has a larger capacity, the length of the air passage is reduced, the cold loss of the low-temperature airflow generated by the ice-making evaporator 40 is less, the independent ice-making evaporator 40 is used for specially providing the cold for the ice-making chamber, hence the ice-making efficiency of the ice-making machine 30 is improved, the probability that the low-temperature airflow has peculiar smell can be reduced, and the ice-making effect of the ice-making machine 30 is better.

In addition, the blower chamber 12 may be directly defined by the refrigerator cabinet 10 so that the blower 50 is directly installed in the blower chamber 12; alternatively, an installation space of the blower 50 is provided on the refrigerator cabinet 10, a housing of the blower 50 is formed as the blower chamber 12, and the blower 50 is directly installed in the installation space.

It should be noted that the refrigerator door 20 is pivotally connected to the refrigerator cabinet 10, the air inlet 211 is in communication with the air supply port 13a when the refrigerator door 20 is closed and the air outlet 212 is in communication with the air return port 14a to provide low-temperature air flow to the ice maker 30; when the refrigerator door 20 is opened, the air inlet 211 is not communicated with the air supply port 13a and the air outlet 212 is not communicated with the air return port 14a to stop providing low-temperature air flow to the ice maker 30; furthermore, if the refrigerator is a left-hand refrigerator that opens right-to-left, the blower 50 is correspondingly arranged on the left side wall of the refrigerator to drive the low-temperature air flow to the air inlet 211 from the air supply port 13a on the left side wall of the refrigerator cabinet 10; if the refrigerator is a right-hand refrigerator that opens left-to-right, the blower 50 is correspondingly installed on the right side wall of the refrigerator to drive the low-temperature air flow to the air inlet 211 from the air supply port 13a on the right side wall of the refrigerator cabinet

10.

As shown in FIGS. 1, 2, 6 and 7, the air supply duct 13 is positioned above the air return duct 14, the ice-making evaporation chamber 11 and the blower chamber 12, the blower chamber 12 is positioned behind the air return duct 14, the inlet of the air supply duct 13 is connected to the upper end of the ice-making evaporation chamber 11, and the outlet of the air return duct 14 is connected to the front end of the blower chamber 12.

That is to say, the air supply duct 13, the ice-making evaporation chamber 11, the blower chamber 12, the ice-making chamber 21, and the air return duct 14 form an air flow passage, and the air supply duct 13 is positioned above. Therefore, the low-temperature air flow flows into the ice-making chamber 21 from the air supply duct 13, the high-temperature air flow in the ice-making chamber 21 flows back to the ice-making evaporation chamber 11 from the air return port 14a, and then the position of the air supply duct 13 above enables the low-temperature air flow to quickly flow into the ice-making chamber 21 under the action of gravity and the high-temperature airflow in the ice-making chamber 21 is rapidly drawn back by the blower 50 to accelerate the circulation of the low-temperature airflow, thereby increasing the ice-making speed of the ice maker 30.

In the specific embodiment shown in FIG. 2, the ice-making evaporation chamber 11 is in communication with the blower chamber 12 through a connection chamber (located in a connection section 133 shown in FIG. 13), the front end of the connection chamber is in communication with the rear end of the blower chamber 12, and the rear end of the connection chamber is in communication with the lower part of the ice-making evaporation chamber 11.

Specifically, the lower part of the ice-making evaporation chamber 11 is attached to one end of the connection chamber located at the rear wall of the refrigerator cabinet 10, and one end of the connection chamber located at the side wall of the refrigerator cabinet 10 is in communication with the blower chamber 12 and fastened by screws; furthermore, areas where the connection chamber is connected to the blower chamber 12 and with the ice-making evaporation chamber 11 are sealed by adhesive tape and viscous foam. In this manner, not only can the foaming agent be prevented from entering the chamber to block the airflow passage, but also the air tightness of the airflow passage can be improved, to prevent leakage of low-temperature airflow and improve the

ice-making efficiency.

It is to be noted that the connection section 133 having a right angle between the ice-making evaporation chamber 11 and the blower chamber 12 and the connection chamber defined by the connection section 133 allow the low-temperature air flow in the ice-making evaporator 40 to completely flow into the blower chamber 12 through the right-angled connection chamber.

As shown in FIGS. 12 and 13, the refrigerator cabinet 10 includes a cabinet body 15, a first cover plate 16 and a second cover plate 17, wherein the cabinet body 15 includes a casing 151, an inner container 152 and an insulating layer 153 clamped between the casing 151 and the inner container 152, the air supply duct 13, the air return duct 14 and a connection air duct are all embedded in the insulating layer 153, and the rear wall of the cabinet body 15 is provided with a first accommodating groove penetrating through the inner container 152 and part of the insulating layer 153; the first cover plate 16 covers and closes the first accommodating groove and together define the ice-making evaporation chamber 11, a part of the insulating layer 153 of the side wall of the cabinet body 15 protrudes inwards and passes through the inner container 152, a second accommodating groove is defined in the part of the insulating layer 153, the second cover plate 17 covers and closes the second accommodating groove, and the second accommodating groove and the second cover plate together define the blower chamber 12.

Specifically, the insulation layer 153 is arranged between the outer casing 151 and the inner container 152 of the cabinet body 15, part of the insulation layer 153 is hollowed out or the air duct assembly 24 is embedded in the insulation layer 153 to form the air supply air duct 13, the air return duct 14 and the connection air duct; the first accommodating groove is further formed in the rear wall of the cabinet body 15, and the ice-making evaporator 40 is installed in the first accommodating groove; the second accommodating groove is formed in the side wall of the cabinet body 15, the blower 50 is installed in the second accommodating groove, the first cover plate 16 and the rear wall of the casing 151 of the cabinet body 15 are fastened by screws to cover the ice-making evaporator 40, and the second cover plate 17 and the side wall of the casing 151 of the cabinet body 15 are fastened by screws to define the blower chamber 12 together with the second accommodating groove.

In this manner, not only can the arrangement of the blower 50 and the ice-making evaporation

chamber 11 on the refrigerator cabinet 10 be more reasonable, so that the refrigerating chamber of the refrigerator has a larger storage space, but also condensation at the ice-making evaporation chamber 11 in the refrigerating chamber can be prevented.

In addition, the bottom of the ice-making evaporation chamber 11 is also provided with a water outlet for discharging condensed water generated during defrosting of the ice-making evaporator 40, and the first cover plate 16 may be provided with an inner plate 161, an outer plate 162 and a cover plate insulating layer 163 (see FIG. 12). Furthermore, by providing the cover plate insulating layer 163, the first cover plate 16 may reduce the loss of the cold of the ice-making evaporation chamber 11 to lower the temperature of the low-temperature airflow entering the ice-making chamber 21, and the ice-making speed of the ice maker 30 is thus increased.

It should be noted that after being installed in the first accommodating groove, the ice-making evaporator 40 is fixed by the first cover plate 16, and the front surface of the first cover plate 16 is flush with the surface of the inner container 152 of the refrigerator cabinet 10, so that the space inside the refrigerating chamber is larger, the blower 50 is installed in the second accommodating groove, and the side wall of the second accommodating groove is made of the same material as the insulating layer 153, so that not only can the blower 50 be fixedly supported, but also leakage of the low-temperature airflow in the blower chamber 12 can be prevented.

With reference to FIGS. 3, 4, 8 and 9, the refrigerator door 20 includes a door body 22, a door cover plate 23 and the air duct assembly 24, wherein the ice-making chamber 21 is defined by the door body 22, an ice storage box 60 is further provided in the ice-making chamber 21, the door cover plate 23 is pivotally connected to the door body 22, the air duct assembly 24 is located in the ice-making chamber 21 and divides the ice-making chamber 21 into an ice-making chamber 21 above for installing the ice maker 30 and an ice storage chamber below for installing the ice storage box 60. The ice maker 30 is installed in the ice-making chamber 21, the ice storage box 60 is installed in the ice storage chamber, the air inlet 211 has an upper branch port 2111 and a lower branch port 2112 which are communicated with each other, the upper branch port 2111 is in communication with the ice-making chamber 21, the lower branch port 2112 is in communication with the air duct assembly 24, the air outlet 212 is in communication with the ice storage chamber, and the air duct assembly 24 has an air guide passage 241 that opens at its upper part and a lower

air guide port 242 that is in communication with the air guide passage 241 and faces the ice storage chamber.

Specifically, the ice maker 30 is located at the upper part of the ice-making chamber 21 and is fixed to a screw column of a boss on the inner wall of the ice-making chamber 21 by a screw, and a water filling pipe is provided at the upper right inside the ice-making chamber 21 for filling water into the ice maker 30 to make ice, and the air guide passage 241 is located below the ice maker 30, assembled with the ice maker 30 and fixed to the ice maker 30 by the screw column, the right end of the air guide passage 241 is attached to the air inlet 211 of the ice-making chamber 21, so that the low-temperature air flow directly flows into the air guide passage 241, the ice-making efficiency is thus improved; the upper branch port 2111 guides the low-temperature air flow to be blown over the ice-making machine 30, the lower branch port 2112 guides the low-temperature air flow to be blown over the bottom of the ice-making machine 30, and then the low-temperature air flow blown over from the lower part enters the ice storage chamber through the lower air guide port 242 to cool the ice storage box 60 so as to prevent ice stored in the ice storage box 60 from melting; and the ice-making chamber 21 is internally provided with convex ribs, on one hand, to guide the low-temperature air flow, on the other hand, to fixedly support the ice maker 30 and the air guide passage 241.

In this manner, not only can the low-temperature airflow be distributed in the ice-making chamber 21 to improve the ice-making effect of the ice maker 30 and prevent the ice cubes in the ice storage box 60 from melting, but also the connection of the ice maker 30 and the air guide passage 241 becomes more stable to improve the operational stability of the ice maker 30.

As shown in FIGS. 4 and 8, the air guide passage 241 of the air duct assembly 24 is connected between both side walls of the ice-making chamber 21, and one end of the air guide passage 241 is in communication with the lower branch port 2112. Therefore, one end of the air guide passage 241 is in communication with the lower branch port 2112, so that part of the low-temperature air flow can flow into the ice storage box 60 through the lower branch port 2112, thereby preventing ice in the ice storage box 60 from melting and keeping the temperature in the ice storage box 60 constant.

As shown in FIGS. 10 and 11, the door cover plate 23 has a hollow structure, and the side of

the door cover plate 23 facing the ice-making chamber 21 is provided with a plurality of bosses. Therefore, the door cover plate 23 with the hollow structure can have a better heat insulation effect without adding a heat insulation material in the door cover plate 23, the refrigerator door 20 is lighter and thinner, the production cost of the refrigerator can be reduced, the processing of the refrigerator door 20 is facilitated, and the refrigerating chamber can have a larger volume so as to store more articles.

In some embodiments, the plurality of bosses have cavities therein, so that the boss also has a good heat insulation effect to further reduce the loss of the cold in the freezing chamber.

In the specific embodiment shown in FIGS. 10 and 11, the plurality of bosses are strip-shaped and include a left boss 231, a top boss 233 and a right boss 232 which are sequentially connected, wherein the left boss 231 is adjacent to the left edge of the door cover plate 23, the top boss 233 is adjacent to the upper edge of the door cover plate 23, and the right boss 232 is adjacent to the right edge of the door cover plate 23. Therefore, the arrangement of the left boss 231, the right boss 232 and the top boss 233 enables the door cover plate 23 to be stronger in the structure, and the door cover plate 23 can be kept in distance from the ice storage box 60 by the left boss 231, the right boss 232 and the top boss 233, avoiding difficulties in opening the door cover plate 23 due to icing, and the door cover plate 23 can be opened more simply and conveniently.

In some embodiments, the cavity of the left boss 231 tapers from left to right and the cavity of the right boss 232 tapers from right to left. Therefore, the structure of the plurality of bosses is more reasonable, and when there are more ice cubes in the ice storage box 60, it is possible to prevent the refrigerator door 20 from being closed due to interference between the bosses and the ice cubes.

As shown in FIG. 7, the air supply duct 13 includes: a first sub air supply section 131 and a second sub air supply section 132, wherein the first sub air supply section 131 and the blower chamber 12 are located in the same side wall, the first sub air supply section 131 gradually inclines downwards from front to back, the air supply port 13a is formed at the front end of the first sub air supply section 131; the second sub air supply section 132 is located in the rear wall, and the second sub air supply section 132 gradually extends downwards away from the side wall where the blower chamber 12 is located.

That is to say, the first sub air supply section 131 is located on the side wall of the refrigerator cabinet 10, and the second sub air supply section 132 is located on the rear wall of the refrigerator cabinet 10. Therefore, the supply port 13a and the return port 14a at the upper end of the side wall of the refrigerator cabinet 10 are communicated with the ice-making evaporation chamber 11 at the lower end of the rear wall of the refrigerator cabinet 10 by providing the first sub supply section 131 and the second sub supply section 132, so that the low-temperature airflow generated by the ice-making evaporator 40 can directly flow out through the supply duct 13.

In some embodiments, the air return duct 14 gradually extends downwards from front to back, and the first sub air supply section 131 and the air return duct 14 gradually move away from each other from front to back. Therefore, the air supply duct 13 is spaced apart from the return duct 14 to reduce heat exchange between the air supply duct 13 and the air flow in the return duct 14, thereby reducing the cold loss of the low-temperature air flow in the air supply duct 13.

With reference to FIG. 7, an air guide groove 18 is provided in each of the air supply duct 13 and the return duct 14. In this manner, not only can the low-temperature air flow be guided by the air guide groove 18 to increase the flow velocity and prevent the air flow from accumulating in the air supply duct 13 or the return duct 14, but also the structural strength of the air supply duct 13 and the return duct 14 is improved.

In some embodiments, the supply air duct 13 and the air return duct 14 are formed by sequentially joining a plurality of air ducts. Specifically, the air supply duct 13 is composed of the first sub air supply section 131, the connection section 133 (with the connection chamber defined therein) and the second sub air supply section 132, and the connection area has adhesive foam and adhesive tapes attached thereto to improve the air tightness of the duct.

Therefore, the air supply duct 13 and the air return duct 14 are divided into a plurality of air ducts to be independently processed, so that the processing of the air supply duct 13 and the air return duct 14 is simpler, and the production cost of the air ducts is reduced.

In the following, an ice-making process of the ice maker 30 of the embodiment of the present disclosure will be described with reference to FIG. 5.

As shown in FIG. 5, the ice-making evaporator 40 is installed on the rear wall of the refrigerator cabinet 10, the ice-making evaporator 40 is in communication with the blower 50

through the air supply duct 13 and the air return duct 14, the blower 50 is installed on the side wall of the refrigerator cabinet 10, the low-temperature air flow in the ice-making evaporator 40 flows into the ice-making chamber 21 through the air supply duct 13, and the high-temperature air flow in the ice-making chamber 21 flows back to the ice-making chamber 21 through the air return duct 14. The ice-making chamber 21 is located on the refrigerator door 20 and is in communication with the air supply air duct 13 through the air inlet 211 and with the air return duct 14 through the air outlet 212, and the ice-making chamber 21 is internally provided with the ice maker 30 and the air guide passage 241 located below the ice maker 30.

Therefore, the ice-making evaporator 40 lowers the temperature of the airflow which then flows into the ice-making chamber 21 through the air supply duct 13 under the driving of the blower 50, part of the air flow supplies cold to the ice-making chamber 21 directly through the upper branch port 2111, and the other part of the air flow directly enters the air duct assembly 24 through the lower branch port 2112 and is distributed by the air guide passage 241, not only supplied to the ice-making machine 30 to make ice, but also supplied to the ice storage box 60 to keep the temperature of the ice storage box 60 constant. In this manner, the high-temperature air flow in the ice-making chamber 21 is drawn away from the ice-making chamber 21 by the blower 50, flows to the ice-making evaporator 40 through the air return duct 14 to be cooled down, and flows to the ice-making chamber 21 again after being cooled down to complete the air flow circulation of the ice maker 30 (the air flow direction is shown by an arrow in FIG. 5).

In the description of the present disclosure, it is to be understood that the terms indicating orientation and positional relationships, such as “center”, “longitudinal”, “transverse”, “length”, “width”, “thickness”, “upper”, “lower”, “front”, “rear”, “left”, “right”, “vertical”, “horizontal”, “top”, “bottom”, “inner”, “outer”, “clockwise”, “counterclockwise”, “axial”, “radial” and “circumferential”, are based on that is shown in the drawings, intended merely for facilitating description and render simplicity, and not intended to indicate or imply that the referenced device or element must have a particular orientation, or be constructed and operated in a particular orientation. It is therefore not to be construed as limiting the present disclosure.

Furthermore, the terms “first” and “second” are used for illustrative purposes only and are not to be construed as indicating or implying relative importance or the number of technical

features. Therefore, features defined by “first” and “second” may explicitly or implicitly include one or more such features. In the description of the present disclosure, the meaning of “plurality” is two or more unless specifically defined otherwise.

In the present disclosure, unless expressly stated and defined otherwise, the terms “installed”, “connected”, “attached”, “fixed” and the like are to be construed broadly, for example, as either fixed or detachable connection, or an integration; as either a mechanical connection or an electrical connection; as either a direct connection or an indirect connection through an intermediary; as either internal communication between two elements or an interactive relationship between the two elements. The specific meaning of the above terms in this disclosure will be construed by those of ordinary skill in the art depending on circumstances.

In this disclosure, unless expressly stated and defined otherwise, the “above” or “below” relationship between a first feature and a second feature may mean that the first and second features are in direct contact, or that the first and second features are in indirect contact via an intermediary. Furthermore, in the case of the first feature is “above”, “over” and “on” the second feature, the first feature may be directly above or obliquely above the second feature, or simply the level of the first feature is higher than that of the second feature. In the case of the first feature “below”, “under” and “beneath” the second feature, first feature may be directly below or obliquely below the second feature, or simply the level of the first feature is lower than that of the second feature.

In the description of the present specification, the terms “an embodiment”, “some embodiments”, “examples”, “specific examples” or “some examples” and the like mean 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 present disclosure. In the present specification, the above terms are not necessarily directed to the same embodiment or example. Furthermore, the specific features, structures, materials, or characteristics described may be combined in any one or more embodiments or examples in a suitable manner. Moreover, various embodiments or examples described in this specification, as well as features of various embodiments or examples, may be combined by those skilled in the art without conflicting with each other.

Although embodiments of the present disclosure have been shown and described above, it is

to be understood that the above-described embodiments are illustrative and are not limiting the disclosure; changes, modifications, substitutions and variations of the above-described embodiments can be made by those of ordinary skill in the art without departing the scope of the disclosure.

WHAT IS CLAIMED IS:

1. A refrigerator integrated with an ice maker, comprising:

a refrigerator cabinet defining a refrigerating chamber and a freezing chamber in the refrigerator cabinet, having a rear wall provided with an ice-making evaporation chamber, a left side wall and a right side wall one of which provided with a blower chamber, the ice-making evaporation chamber being located at a back side of the refrigerating chamber; an air supply duct and an air return duct being further provided in the refrigerator cabinet, and the air return duct, the blower chamber, the ice-making evaporation chamber, and the air supply duct being sequentially connected, a free end of the air supply duct being formed as an air supply port, and a free end of the air return duct being formed as an air return port;

a refrigerator door provided with an ice-making chamber, the ice-making chamber having an air inlet and an air outlet, wherein the air inlet is in communication with the air supply port and the air outlet is in communication with the air return port when the refrigerator door is closed, and the refrigerator door is pivotally connected to a side wall of the refrigerator cabinet where the blower chamber is located;

an ice maker located in the ice-making chamber;

an ice-making evaporator located in the ice-making evaporation chamber; and

a blower located in the blower chamber;

wherein the air supply duct is positioned above the air return duct, the ice-making evaporation chamber and the blower chamber, the blower chamber is positioned behind the air return duct, an inlet of the air supply duct is connected to an upper end of the ice-making evaporation chamber, and an outlet of the air return duct is connected to a front end of the blower chamber.

2. The refrigerator according to claim 1, wherein the air supply duct is located above the air return duct, the ice-making evaporation chamber, and the blower chamber, the blower chamber is located behind the air return duct, an inlet of the air supply duct is connected to an upper end of the ice-making evaporation chamber, and an outlet of the air return duct is connected to a front end of the blower chamber.

3. The refrigerator according to any one of claims 1 to 2, wherein the ice-making evaporation chamber is in communication with the blower chamber through a connection chamber, a front end of the connection chamber is in communication with a rear end of the blower chamber, and a rear

end of the connection chamber is in communication with a lower part of the ice-making evaporation chamber.

4. The refrigerator according to any one of claims 1 to 3, wherein the refrigerator cabinet comprises:

a cabinet body comprising a casing, an inner container, and an insulating layer sandwiched between the casing and the inner container, and the air supply duct, the air return duct and a connecting duct being embedded in the insulating layer;

a first cover plate, a rear wall of the cabinet body being provided with a first accommodating groove penetrating through the inner container and a part of the insulating layer, the first cover plate covering and closing the first accommodating groove, and the first cover plate and the first accommodating groove together defining the ice-making evaporation chamber; and

a second cover plate, a part of the insulating layer of a side wall of the cabinet body protruding inwards and passing through the inner container, the part of the insulating layer defining a second accommodating groove therein, the second cover plate covering and closing the second accommodating groove, and the second accommodating groove and the second cover plate together defining the blower chamber.

5. The refrigerator according to any one of claims 1 to 4, wherein the refrigerator door comprises:

a door body defining the ice-making chamber therein, and an ice storage box being further provided in the ice-making chamber;

a door cover plate pivotally connected to the door body; and

an air duct assembly located in the ice-making chamber and dividing the ice-making chamber into an upper ice-making chamber for installing the ice maker and a lower ice storage chamber for installing the ice storage box, the ice maker being installed in the ice-making chamber, and the ice storage box being installed in the ice storage chamber;

wherein the air inlet has an upper branch port and a lower branch port in communication with each other, the upper branch port is in communication with the ice-making chamber, the lower branch port is in communication with the air duct assembly, the air outlet is in communication with the ice storage chamber, and the air duct assembly has an air guide passage having an opening an upper part and a lower air guide port in communication with the air guide passage and facing the ice storage chamber.

6. The refrigerator according to claim 5, wherein the air guide passage of the air duct assembly is connected between two side walls of the ice-making chamber, and an end of the air guide passage is in communication with the lower branch port.

7. The refrigerator according to claim 5, wherein the door cover plate has a hollow structure, and a side of the door cover plate facing the ice-making chamber is provided with a plurality of bosses.

8. The refrigerator according to claim 7, wherein the plurality of bosses have cavities therein.

9. The refrigerator according to claim 7, wherein the plurality of bosses are strip-shaped and comprise a left boss, a top boss, and a right boss which are sequentially connected, the left boss is adjacent to a left edge of the door cover plate, the top boss is adjacent to an upper edge of the door cover plate, and the right boss is adjacent to a right edge of the door cover plate.

10. The refrigerator according to claim 9, wherein a cavity of the left boss diminishes gradually from a left to a right, and a cavity of the right boss diminishes gradually from the right to the left.

11. The refrigerator according to any one of claims 1 to 10, wherein the air supply duct comprises:

a first sub air supply section, the first sub air supply section and the blower chamber being located at a same side wall, the first sub air supply section gradually inclining downwards from a front to a back, and the air supply port being formed at a front end of the first sub air supply section; and

a second sub air supply section, the second sub air supply section being located in the rear wall and gradually extending downwards away from the side wall where the blower chamber is located.

12. The refrigerator according to claim 11, wherein the air return duct gradually extends downwards from the front to the back, and the first sub air supply section and the air return duct are gradually away from each other from the front to the back.

13. The refrigerator according to claim 1, wherein an air guide groove is provided in each of the air supply duct and the air return duct.

14. The refrigerator according to claim 1, wherein the air supply duct and the air return duct are formed by a plurality of air ducts, and the plurality of air ducts are sequentially jointed.

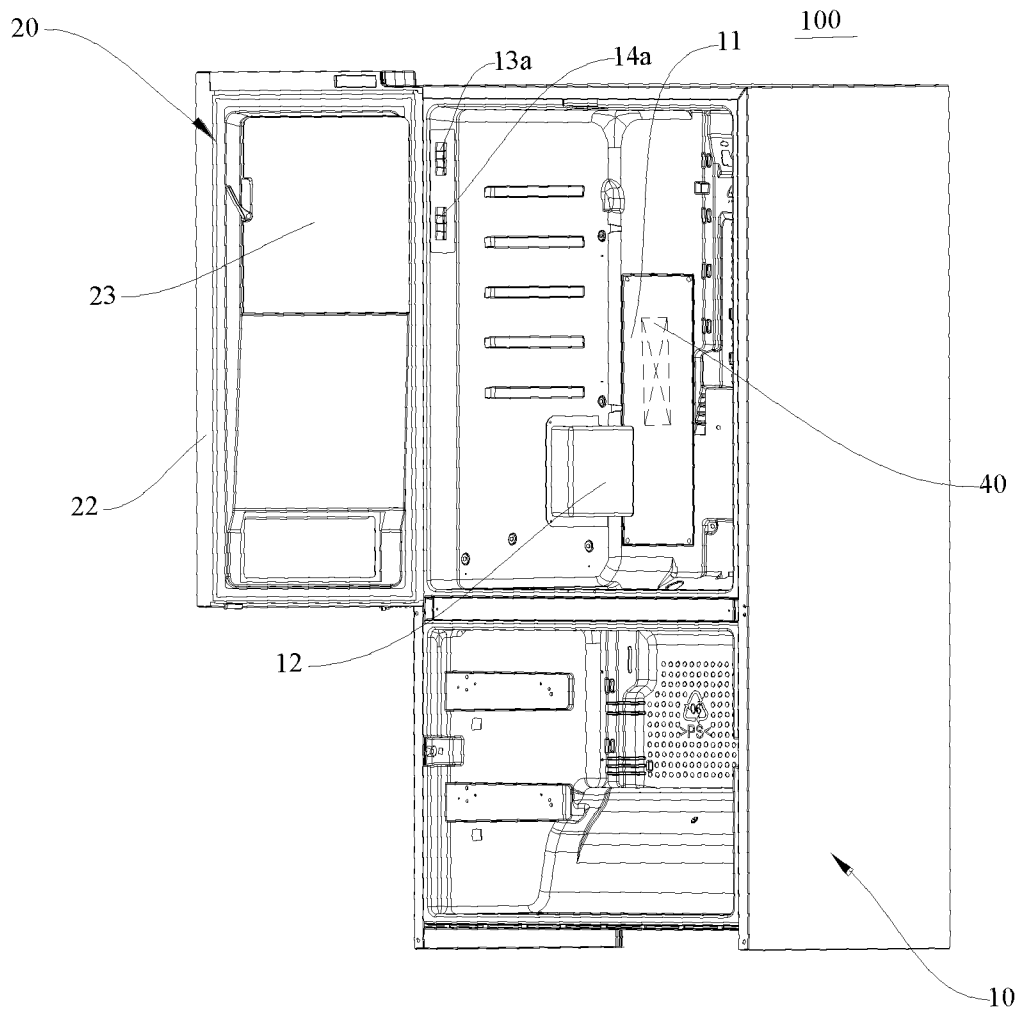


FIG. 1

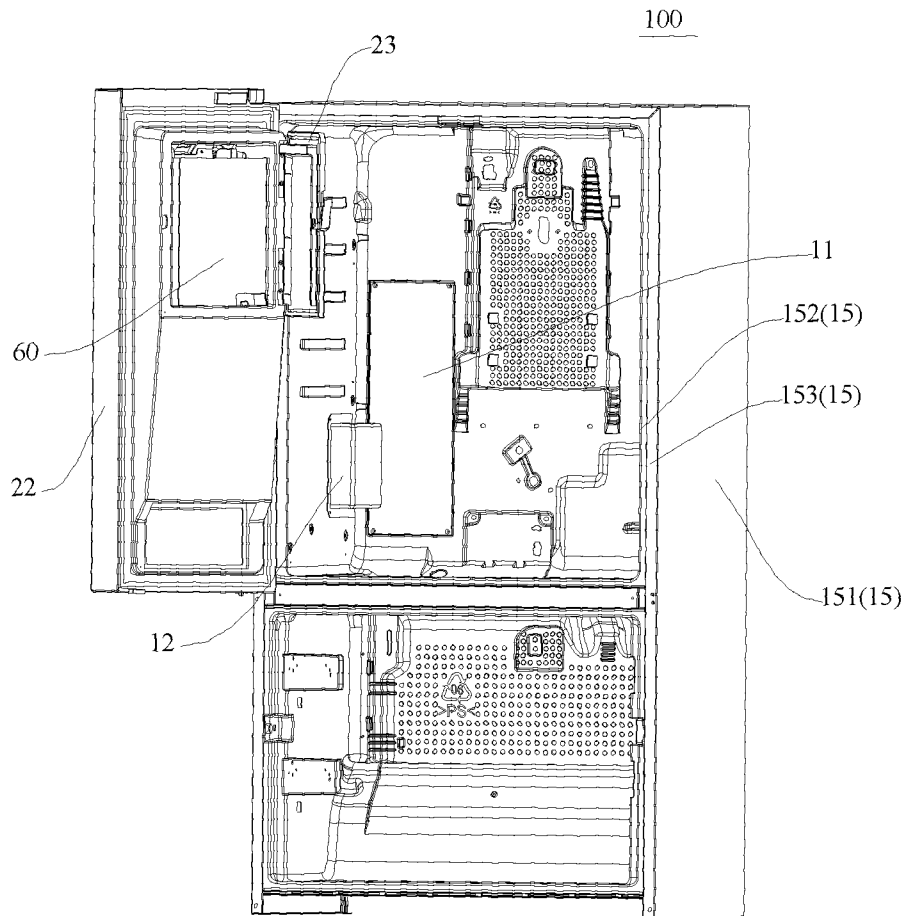


FIG. 2

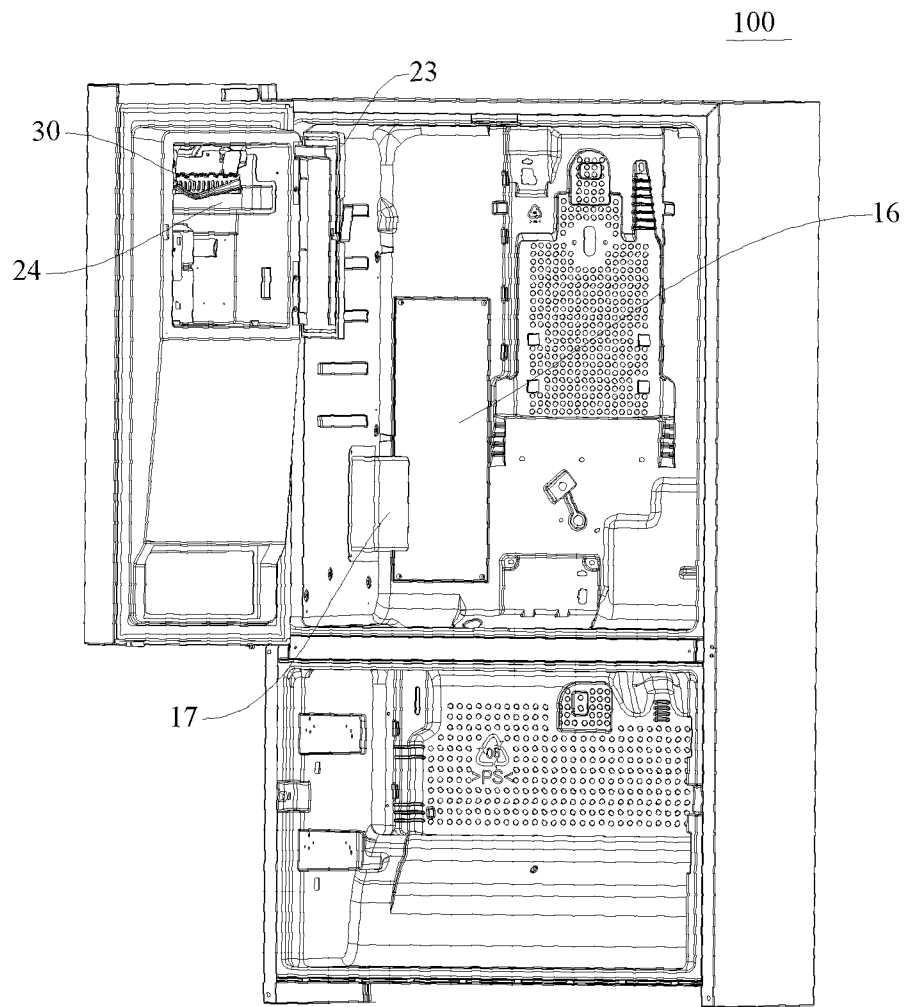


FIG. 3

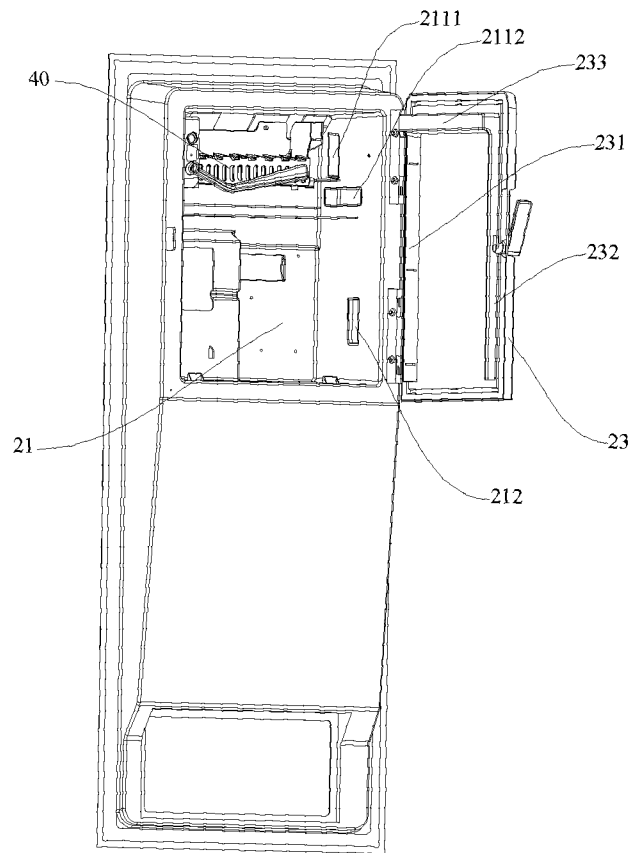


FIG. 4

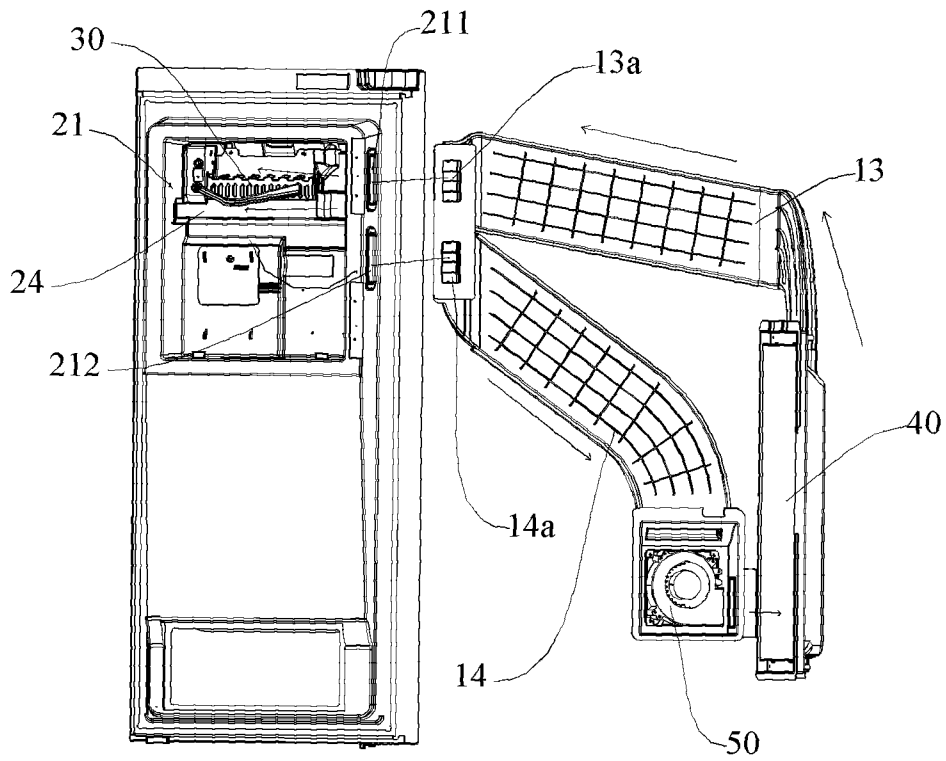


FIG. 5

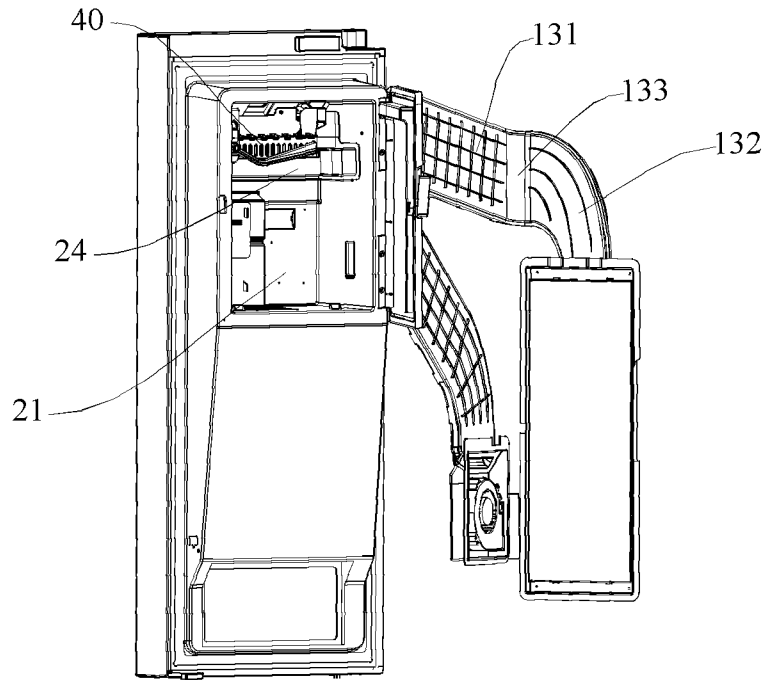


FIG. 6

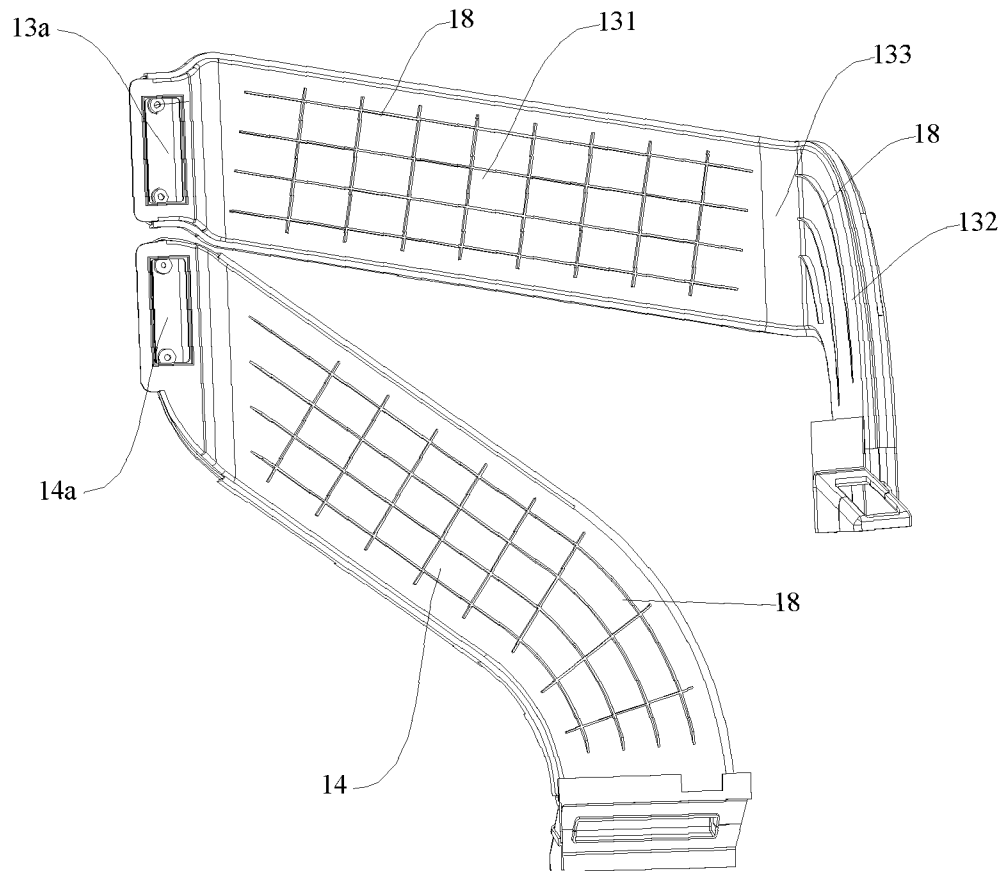


FIG. 7

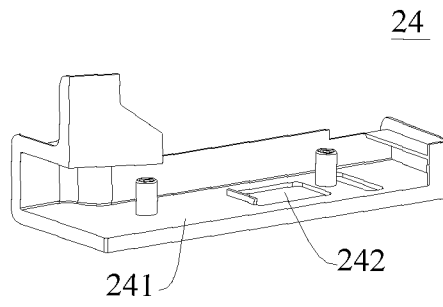


FIG. 8

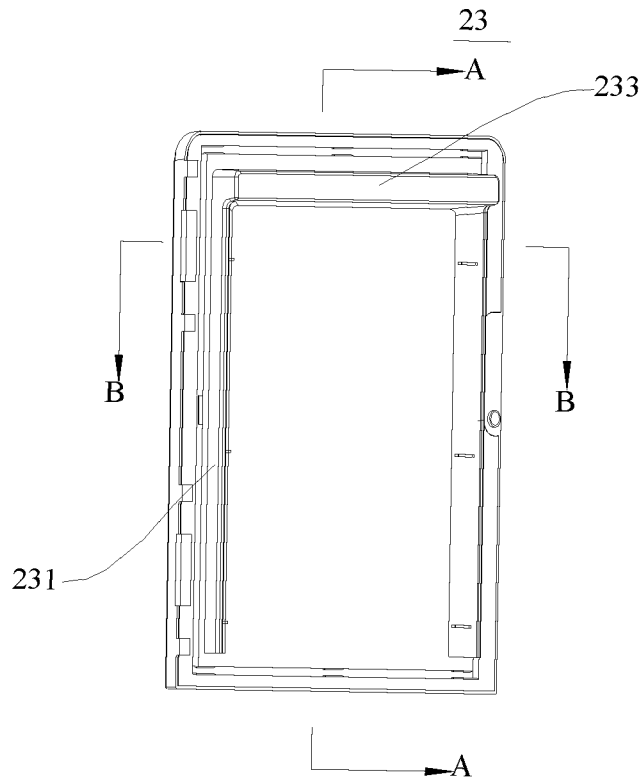


FIG. 9

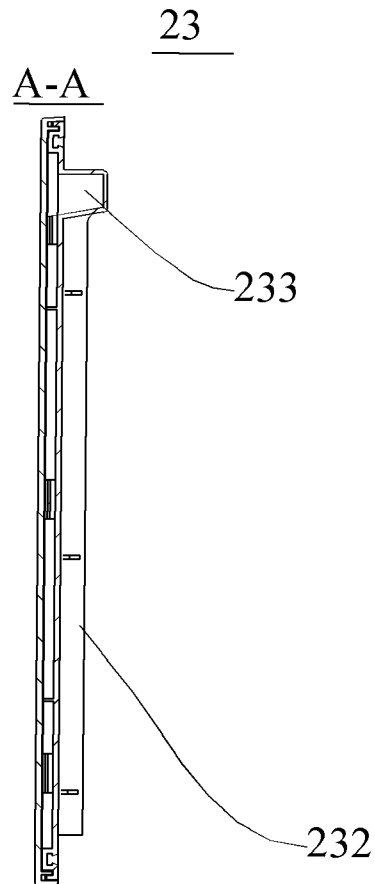


FIG. 10

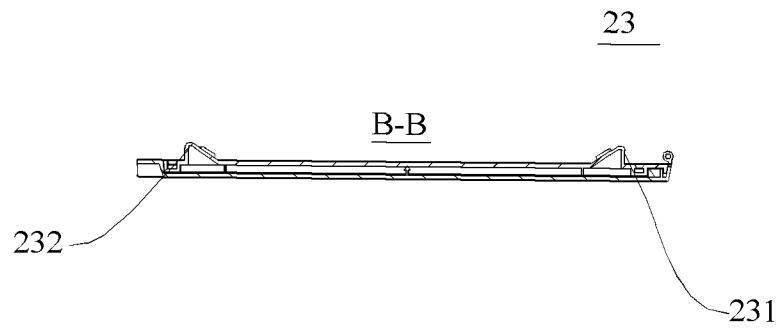


FIG. 11

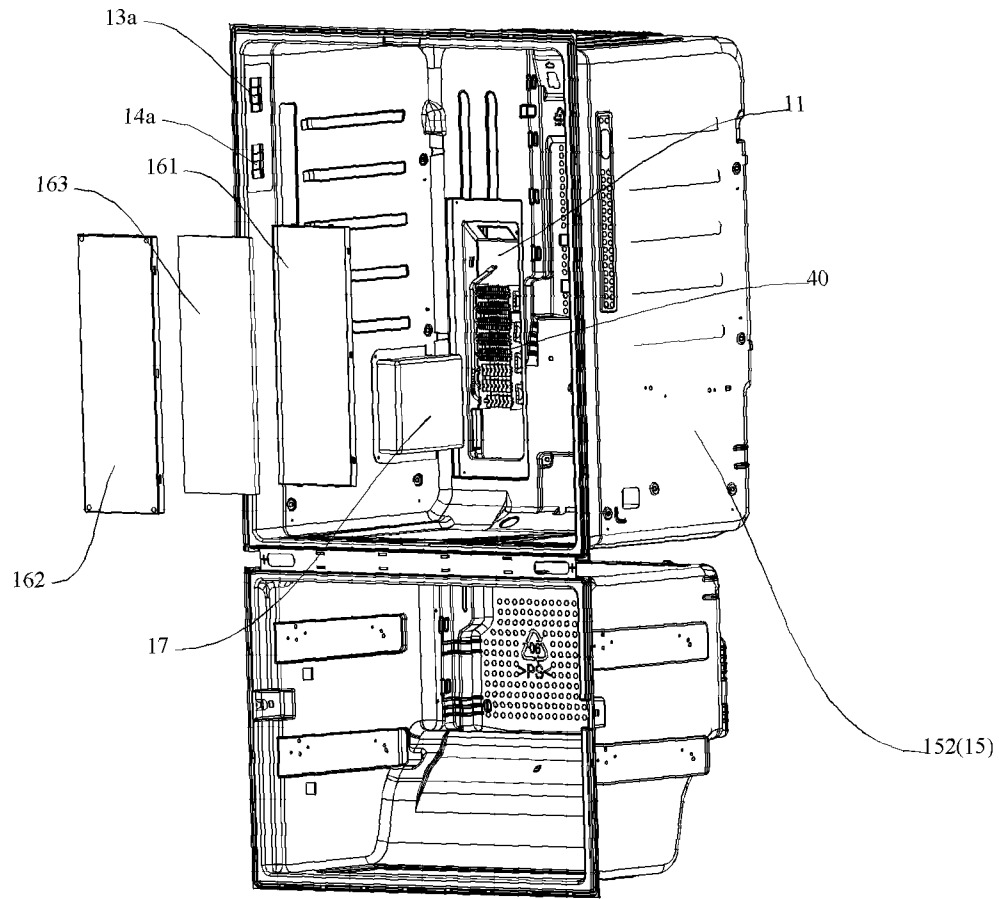


FIG. 12

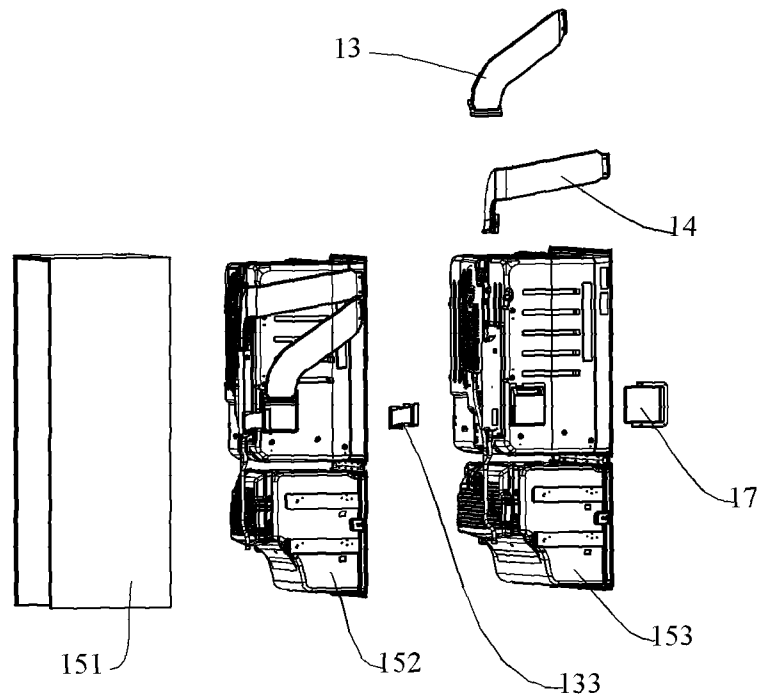


FIG. 13

