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(54) **REFRIGERATOR**

(57) The present invention provides a refrigerator, comprising: a cabinet body defining a refrigerating chamber, a moisturizing drawer being arranged in the refrigerating chamber; a door body pivotally connected to the cabinet body and configured to open and close the refrigerating chamber; a refrigeration system configured to provide cold energy for the refrigerating chamber; and an ice-making chamber arranged in the door body and having an ice-making assembly arranged therein, the ice-making chamber and the refrigerating chamber being heat-insulated when the door body is closed. The door body is provided with a drainage pipeline; an inlet end of the drainage pipeline is connected to the ice-making

chamber; the door body is further provided with a water storage box and a humidifying apparatus communicated with the water storage box; an outlet end of the drainage pipeline leads to the water storage box; the cabinet body is provided with an exhaust passage communicated with the moisturizing drawer; a first exhaust vent and a second exhaust vent are arranged on an inner side and an opposite outer side of the cabinet body, respectively; the first exhaust vent is communicated with the exhaust passage when the door body is closed; and the humidifying apparatus is selectively communicated with the first exhaust vent to humidify the moisturizing drawer or communicated with the second exhaust vent.

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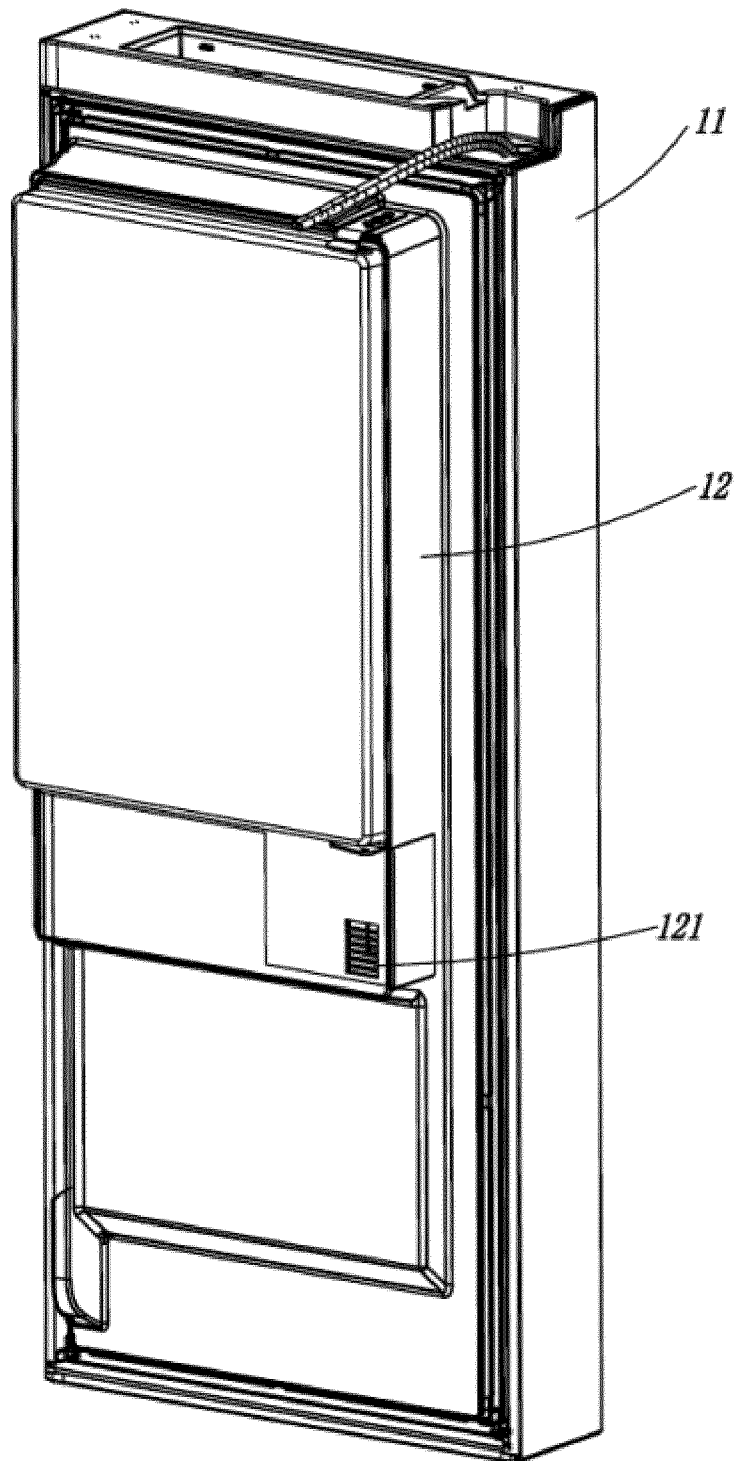


FIG. 3

Description

TECHNICAL FIELD

[0001] The present invention relates to the field of refrigeration appliances, and in particular relates to a refrigerator with an ice maker.

BACKGROUND ART

[0002] An ice maker typically arranged in a freezing chamber of a refrigerator is configured to make ice by means of cold air in the freezing chamber. However, for a refrigerator with a refrigerating chamber and the freezing chamber distributed vertically, a user has to bend down to open a door body of the freezing chamber when taking ice. In order to make it convenient for the user to take ice, in some existing refrigerators, the refrigerating chambers or door bodies of the refrigerating chambers are provided with independent ice-making chambers, ice makers are arranged in the ice-making chambers, and dispenser capable of distributing ice made by the ice makers are arranged on the outer sides of the door bodies, so that ice can be taken without opening the door bodies.

[0003] However, when the door body of the refrigerating chamber is provided with an independent ice-making chamber, defrosting water produced by the ice maker or other components will accumulate in the ice-making chamber. In an existing refrigerator, to discharge the defrosting water, a pipeline is employed to guide the defrosting water from the ice-making chamber into a water tray below the dispenser outside the door body, which may cause some health hazards due to water accumulated in the water tray, and bring inconvenience to the user. As a result, it is necessary to further improve the existing technology.

SUMMARY OF THE INVENTION

[0004] An objective of the present invention is to provide a user-friendly refrigerator.

[0005] In order to achieve the above-mentioned object, the present invention provides a refrigerator, comprising:

a cabinet body, the cabinet body defining a refrigerating chamber;
a door body pivotally connected to the cabinet body and configured to open and close the refrigerating chamber;
a refrigeration system configured to provide cold energy for the refrigerating chamber; and
an ice-making chamber arranged in the door body and having an ice-making assembly arranged therein, the ice-making chamber and the refrigerating chamber being heat-insulated when the door body is closed,
wherein the door body is provided with a drainage

pipeline; an inlet end of the drainage pipeline is connected to the ice-making chamber; the door body is further provided with a water storage box and a humidifying apparatus communicated with the water storage box; an outlet end of the drainage pipeline leads to the water storage box; a first exhaust vent and a second exhaust vent are arranged on an inner side, facing the refrigerating chamber, and an opposite outer side of the door body, respectively; and the humidifying apparatus is selectively communicated with the first exhaust vent to humidify the refrigerating chamber and/or communicated with the second exhaust vent.

[0006] As a further improvement of an embodiment of the present invention, wherein the humidifying apparatus comprises an atomizing module connected to the water storage box and a fan adjacent to the atomizing module, and the humidifying apparatus is selectively communicated with the first exhaust vent or the second exhaust vent by controlling the fan.

[0007] As a further improvement of an embodiment of the present invention, wherein the fan comprises a first fan of which an exhaust direction faces the first exhaust vent, and a second fan of which an exhaust direction faces the second exhaust vent, and either of the first fan and the second fan is started to be selectively communicated with the first exhaust vent or the second exhaust vent.

[0008] As a further improvement of an embodiment of the present invention, wherein a dispenser is arranged on an outer side of the door body; the dispenser selectively discharges ice made by the ice-making assembly; a dispenser groove is formed in a housing of the door body; and the second exhaust vent is arranged in the dispenser groove.

[0009] As a further improvement of an embodiment of the present invention, further comprising an ice-making assembly arranged in the ice-making chamber, the ice-making assembly comprising:

an ice mold, the ice mold being provided with a plurality of ice cube trays for containing ice-making water;

a refrigerant pipe extending from one end of the ice mold to the other end and located at a bottom of the ice mold, the refrigerant pipe being connected to the refrigeration system;

a heating wire fixed to the bottom of the ice mold and spaced from the refrigerant pipe; and

a drain tray connected below the ice mold, a water outlet being formed at one end of the drain tray, and the water outlet being inserted into the inlet end of the drainage pipeline.

[0010] As a further improvement of an embodiment of the present invention, wherein the door body comprises a door shell and a door liner combined with the door shell;

the door liner comprises a back surface facing the refrigerating chamber and two side surfaces connected to both of the back surface and the door shell; the first exhaust vent is arranged on the back surface of the door liner; the second exhaust vent is arranged on the door shell; and the water storage box and the humidifying apparatus are embedded between the door liner and the door shell from the side surface of the door liner close to a pivoting side of the door body.

[0011] As a further improvement of an embodiment of the present invention, wherein the door body is provided with a cavity; the humidifying apparatus is mounted at a bottom of the cavity; the water storage box is detachably mounted in the cavity and located above the humidifying apparatus; one side wall of the water storage box extends downwards to form a cover plate; the cover plate covers the humidifying apparatus; and the water storage box shields an opening of the cavity.

[0012] As a further improvement of an embodiment of the present invention, wherein a filtering module is arranged between the outlet end of the drainage pipeline and the water storage box, and the filtering module is mounted in the water storage box.

[0013] As a further improvement of an embodiment of the present invention, wherein a humidity sensor is arranged in the refrigerating chamber; the refrigerator comprises a controller connected to both of the humidity sensor and the humidifying apparatus; when a humidity detected by the humidity sensor is lower than a preset value, the controller starts up the humidifying apparatus and the humidifying apparatus is communicated with the first exhaust vent and disconnected from the second exhaust vent.

[0014] As a further improvement of an embodiment of the present invention, wherein the door body is further provided with a water level sensor for detecting the quantity of water in the water storage box; the refrigerator comprises a controller connected to both of the water level sensor and the humidifying apparatus; when a water level detected by the water level sensor is higher than a preset value, the controller starts up the humidifying apparatus, and the humidifying apparatus is communicated with the second exhaust vent and disconnected from the first exhaust vent.

[0015] As a further improvement of an embodiment of the present invention, wherein the water storage box is detachably mounted on the door body; a display panel is arranged on an outer side of the door body; the display panel is connected to the controller; and the controller controls the display panel to display when the water level detected by the water level sensor is lower than the preset value.

[0016] Compared with the prior art, in embodiments of the present invention, a humidifying apparatus is selectively communicated with a first exhaust vent or a second exhaust vent, so that defrosting water in an ice-making chamber can be reused to humidify a refrigerating chamber or be discharged to the outside of the refrigerator,

thereby avoiding cleaning by a user. In addition, functions of the refrigerator can be increased without increasing the cost, which improves the user experience.

[0017] In order to achieve the above-mentioned object, the other embodiment of the present invention provides a refrigerator, comprising:

a cabinet body, the cabinet body defining a refrigerating chamber, and a moisturizing drawer being arranged in the refrigerating chamber;

a door body pivotally connected to the cabinet body and configured to open and close the refrigerating chamber;

a refrigeration system configured to provide cold energy for the refrigerating chamber; and

an ice-making chamber arranged in the door body and having an ice-making assembly arranged therein, the ice-making chamber and the refrigerating chamber being heat-insulated when the door body is closed,

wherein the door body is provided with a drainage pipeline; an inlet end of the drainage pipeline is connected to the ice-making chamber; the door body is further provided with a water storage box and a humidifying apparatus communicated with the water storage box; an outlet end of the drainage pipeline leads to the water storage box; the cabinet body is provided with an exhaust passage communicated with the moisturizing drawer; a first exhaust vent and a second exhaust vent are arranged on an inner side and an opposite outer side of the door body, respectively; when the door body is closed, the first exhaust vent is communicated with the exhaust passage; and the humidifying apparatus is selectively communicated with the first exhaust vent to humidify the moisturizing drawer or communicated with the second exhaust vent.

[0018] As a further improvement of an embodiment of the present invention, wherein a humidity sensor is arranged in the moisturizing drawer; the refrigerator comprises a controller connected to both of the humidity sensor and the humidifying apparatus; when a humidity detected by the humidity sensor is lower than a preset value, the controller starts up the humidifying apparatus, and the humidifying apparatus is communicated with the first exhaust vent and disconnected from the second exhaust vent.

[0019] As a further improvement of an embodiment of the present invention, wherein the door body is further provided with a water level sensor for detecting the quantity of water in the water storage box; the refrigerator comprises a controller connected to both of the water level sensor and the humidifying apparatus; when a water level detected by the water level sensor is higher than a preset value, the controller starts up the humidifying apparatus, and the humidifying apparatus is communicated with the second exhaust vent and disconnected from the first ex-

haust vent.

[0020] As a further improvement of an embodiment of the present invention, wherein the water storage box is detachably mounted on the door body; a display panel is arranged on an outer side of the door body; the display panel is connected to the controller; and the controller controls the display panel to display when the water level detected by the water level sensor is lower than the preset value.

[0021] As a further improvement of an embodiment of the present invention, wherein the door body comprises a door shell and a door liner combined with the door shell; the door liner comprises a back surface facing the refrigerating chamber and two side surfaces connected to both of the back surface and the door shell; the first exhaust vent is arranged on the side surface of the door liner close to a pivoting side of the door body; the second exhaust vent is arranged on the door shell; and the water storage box and the humidifying apparatus are embedded between the door liner and the door shell.

[0022] As a further improvement of an embodiment of the present invention, wherein the door body is provided with a cavity; the humidifying apparatus is mounted at the bottom of the cavity; the water storage box is detachably mounted in the cavity and located above the humidifying apparatus; one side wall of the water storage box extends downwards to form a cover plate; the cover plate covers the humidifying apparatus; the water storage box shields an opening of the cavity; and the first exhaust vent is arranged on the cover plate.

[0023] As a further improvement of an embodiment of the present invention, wherein a filtering module is arranged between the outlet end of the drainage pipeline and the water storage box, and the filtering module is mounted in the water storage box.

[0024] As a further improvement of an embodiment of the present invention, wherein the humidifying apparatus comprises an atomizing module connected to the water storage box and a fan adjacent to the atomizing module, and the humidifying apparatus is selectively communicated with the first exhaust vent or the second exhaust vent by controlling the fan.

[0025] As a further improvement of an embodiment of the present invention, wherein the fan comprises a first fan of which an exhaust direction faces the first exhaust vent, and a second fan of which an exhaust direction faces the second exhaust vent, and either of the first fan and the second fan is started to be selectively communicated with the first exhaust vent or the second exhaust vent.

[0026] As a further improvement of an embodiment of the present invention, wherein a dispenser is arranged on an outer side of the door body; the dispenser selectively discharges ice made by the ice-making assembly; a dispenser groove is formed in a shell of the door body; and the second exhaust vent is arranged in the dispenser groove.

[0027] Compared with the prior art, in embodiments of

the present invention, a humidifying apparatus is selectively communicated with a first exhaust vent or a second exhaust vent, so that defrosting water in an ice-making chamber can be reused to humidify a moisturizing drawer or be discharged to the outside of the refrigerator, thereby avoiding cleaning by a user. In addition, functions of the refrigerator can be increased without increasing the cost, which improves the user experience.

BRIEF DESCRIPTION OF THE DRAWINGS

[0028]

FIG 1 is a schematic diagram of a refrigerator according to a preferred embodiment of the present invention;

FIG 2 is a schematic three-dimensional diagram of the refrigerator in FIG. 1;

FIG 3 is a schematic three-dimensional diagram of a door body of the refrigerator in FIG 2;

FIG. 4 is a schematic three-dimensional diagram of an ice-making assembly on the door body in FIG 3; FIG 5 is a schematic three-dimensional diagram of part of elements on the door body in FIG 3;

FIG 6 is a schematic three-dimensional diagram of a water storage box in FIG. 5;

FIG. 7 is a schematic diagram of working principle of a humidifying apparatus in FIG. 5;

FIG 8 is a three-dimensional diagram of a cabinet body of a refrigerator according to another embodiment of the present invention;

FIG. 9 is a three-dimensional diagram of a door body of the refrigerator in FIG. 8;

FIG 10 is a schematic diagram of the back of a refrigerating chamber of the refrigerator in FIG 8; and FIG 11 is a three-dimensional diagram of a water storage box on the door body in FIG 9.

DETAILED DESCRIPTION

[0029] The present invention will be described in detail below with reference to the particular embodiments shown in the accompanying drawings. However, these embodiments are not intended to limit the present invention, and modifications in structures, methods, or functions made by those of ordinary skill in the art according to these embodiments are all included in the scope of protection of the present invention.

[0030] It should be understood that the terms representing spatial relative positions, such as "up", "down", "out", "in", and the like as used herein of a unit or feature relative to another unit or feature in the accompanying drawings for the purpose of illustration. The terms of the spatial relative positions may be intended to include different orientations of the device in use or operation other than the orientations shown in the accompanying drawings.

[0031] Referring to FIG 1, a refrigerator according to a

preferred embodiment of the present invention includes a cabinet body 20, a door body 10 movably connected to the cabinet body 20 and a refrigeration system. The cabinet body 20 defines a refrigeration compartment. The door body 10 is configured to open and close the refrigeration compartment. The refrigeration system is configured to provide cold energy for the refrigeration compartment. A fan 220 for introducing cold air produced by the refrigeration system into the refrigeration compartment is further arranged in the cabinet body 20. The refrigeration compartment includes a refrigerating chamber 21 and a freezing chamber 22, and of course, may include other compartments, for example, a variable-temperature chamber. The refrigerating chamber 21 and the freezing chamber 22 are arranged vertically, and of course, may also be laterally arranged side by side. The door body 10 is configured to open and close the refrigerating chamber 21. The door body 10 is provided with an ice-making chamber 13, an ice-making assembly 100 is arranged in the ice-making chamber 13, and an ice storage box is arranged below the ice-making assembly and configured to store ice made by the ice-making assembly. The ice-making chamber 13 and the refrigerating chamber 21 are heat-insulated when the door body 10 is closed. There may be one or two door bodies for opening and closing the refrigerating chamber. The ice-making chamber is arranged in one of the door bodies if two door bodies are provided. In this embodiment, the front-rear direction of the refrigerator takes the side where the door body 10 is arranged as the front and the side where the cabinet body 20 is arranged as the rear, and the left-right direction is perpendicular to the up-down direction and the front-rear direction.

[0032] The refrigeration system includes a compressor 913 and a condenser connected to the outlet side of the compressor 913. The refrigeration system is further configured to provide cold energy for the ice-making assembly 100. The compressor 913 is arranged at the bottom of the cabinet body 20. An evaporator 912 for providing cold energy for the freezing chamber 22 and the refrigerating chamber 21 is arranged behind the freezing chamber. In this embodiment, the ice-making assembly 100 makes ice by means of direct contact with a refrigerant pipe, and the evaporator may be connected in series with the refrigerant pipe for providing cold energy for ice making or in parallel with two sides of the compressor 913 and the condenser.

[0033] Referring to FIGs. 2 to 5, frosting may occur when the ice-making assembly 100 works, and defrosting water is required to be drained in time. In this embodiment, the door body 10 is provided with a drainage pipeline 30. The door body 10 includes a door shell 11 and a door liner 12 combined with the door shell 11. The door liner 12 at least partially extends into the refrigerating chamber when the door body is closed. A heat insulating material is filled between the door shell 11 and the door liner 12. The drainage pipeline 30 may be fixed in the heat insulating material between the door shell 11 and

the door liner 12. That is, the door body is foamed after the drainage pipeline 30 is fixed. An inlet end 31 of the drainage pipeline 30 is connected to the ice-making chamber 13, which facilitates connection of water paths.

[0034] The door body 10 is further provided with a water storage box 40 and a humidifying apparatus 50 communicated with the water storage box 40. An outlet end 32 of the drainage pipeline 30 leads to the water storage box 40. A first exhaust vent 121 and a second exhaust vent 111 are arranged on an inner side, facing the refrigerating chamber 21, and an opposite outer side of the refrigerating chamber 21, respectively. The humidifying apparatus 50 is selectively communicated with the first exhaust vent 121 to humidify the refrigerating chamber 21 or communicated with the second exhaust vent 111. Thus, defrosting water discharged from the ice-making chamber 13 may be consumed by means of humidification and selectively used to humidify the refrigerating chamber 21 or discharged to the outside environment, thereby avoiding cleaning by a user and bringing convenience to the user.

[0035] Referring to FIG 4, the ice-making assembly 100 in the ice-making chamber includes an ice mold 101, and a refrigerant pipe 102 and a heating wire that are arranged at the bottom of the ice mold 1001. The ice mold 101 is provided with a plurality of ice cube trays for containing ice-making water. The refrigerant pipe 102 extends from one end of the ice mold to the other end, and the refrigerant pipe 102 is connected to the refrigeration system. The heating wire is fixed to the bottom of the ice mold 101 and spaced from the refrigerant pipe 102. The ice-making assembly 100 further includes a drain tray 103 connected below the ice mold 101. A water outlet 105 is formed at one end of the drain tray 103. The water outlet 105 is inserted into the inlet end 31 of the drainage pipeline 30. In order to make manufacture of the refrigerator more reliable, the inlet end 31 and the outlet end 32 of the drainage pipeline 30 are provided with end opening cover plates 33, respectively, so that when the door body is foamed, the end opening cover plates 33 may abut against corresponding positions on the door liner 12 to prevent a foaming material from overflowing. Similarly, the outlet end 32 of the drainage pipeline 30 may also be provided with an end opening cover plate for abutting against the wall of the cavity on the door body, so that foaming of the cabinet body is more reliable.

[0036] Specifically, a humidity sensor 23 is arranged in the refrigerating chamber 21. The refrigerator includes a controller connected to both of the humidity sensor 23 and the humidifying apparatus. When the humidity detected by the humidity sensor 23 is lower than a preset value, the controller starts up the humidifying apparatus 50, and the humidifying apparatus 50 is communicated with the first exhaust vent 121 and disconnected from the second exhaust vent 111. In this way, the refrigerating chamber 21 may be humidified using the collected ice-making defrosting water, which saves resources and is convenient for the user. Further, the door body is further

provided with a water level sensor 42 for detecting the quantity of water in the water storage box 40. The water level sensor 42 is also connected to the controller. In the case that the humidity detected by the humidity sensor 23 is not lower than the preset value, when the water level detected by the water level sensor 42 is higher than a preset value, the controller may start up the humidifying apparatus 50, and the humidifying apparatus 50 is communicated with the second exhaust vent 111 and disconnected from the first exhaust vent 1001, so that the ice-making defrosting water can be discharged to the outside of the refrigerator in time. The humidifying apparatus 50 is selectively communicated with the first exhaust vent 121 or the second exhaust vent 111, so that the defrosting water in the ice-making chamber 13 can be reused or discharged to the outside of the refrigerator, thereby avoiding cleaning by the user and improving the user experience.

[0037] Further, the water storage box 40 is detachably mounted on the door body 10. A display panel is arranged on the outer side of the door body 10. The display panel is connected to the controller. The controller controls the display panel to display when the water level detected by the water level sensor 42 is lower than the preset value. In this way, when ice making is not performed for a long time and no defrosting water is stored in the water storage box 40, the display on the display panel can remind the user of adding water by itself/himself. In addition, a filtering module 43 may be arranged between the outlet end 32 of the drainage pipeline 30 and the water storage box 40 to facilitate filtration of the defrosting water before it is used for humidification. Preferably, the filtering module 43 is mounted in the water storage box 40, so that even if the user adds water by herself/himself, tap water can be directly added and filtered in the water storage box 40, which ensures safe and secure use when the refrigerating chamber 21 is humidified.

[0038] With continued reference to FIGs. 3 and 5, the door liner 12 includes a back surface facing the refrigerating chamber 21 and two side surfaces connected to both of the back surface and the door shell 11. The first exhaust vent 121 is arranged on the back surface of the door liner 12, and the second exhaust vent 111 is arranged on the door shell 11. A passage 116 may be arranged between the second exhaust vent 111 and the humidifying module 50 to guide an atomized gas to be exhausted from the second exhaust vent 111. The water storage box 40 and the humidifying apparatus 50 are embedded between the door liner 12 and the door shell 11 from the side surface of the door liner 12 close to a pivoting side of the door body. Specifically, the side surface of the door liner 12 close to the pivoting side of the door body is provided with a cavity. The humidifying apparatus 50 is mounted at the bottom of the cavity. The water storage box 40 is detachably mounted in the cavity and located above the humidifying apparatus 50. One side wall of the water storage box 40 extends downwards to form a cover plate 41. The cover plate 41 covers the

humidifying apparatus 50, so that when the water storage box 40 is mounted in the cavity, the water storage box 40 can shield an opening of the cavity to hide the humidifying apparatus 50 in the door body. In addition, both of the water level sensor 42 and the outlet end 32 of the drainage pipeline 30 may be fixed to a wall forming the cavity 121, so as to facilitate pipeline connection of the refrigerator and subsequent foaming. Of course, the water level sensor 42 may also be a sensor for detecting the water level based on the weight of the water storage box 40, and such a water level sensor may be mounted on the humidifying apparatus 50 to facilitate the detection of the weight of the water storage box 40.

[0039] Referring to FIG 6, in this embodiment, the humidifying apparatus 50 includes an atomizing module 51 connected to the water storage box 40 and a fan adjacent to the atomizing module 51. The humidifying apparatus 50 is selectively communicated with the first exhaust vent 121 or the second exhaust vent 111 by controlling the fan. Specifically, a first shielding member 503 and a second shielding member 504 may be provided to shield the first exhaust vent 121 and the second exhaust vent 111, respectively. The fan corresponds to a first fan 53 and a second fan 54 of the first exhaust vent 121 and the second exhaust vent 111, respectively. That is, an exhaust direction of the first fan 53 faces the first exhaust vent 121 and an exhaust direction of the second fan 54 faces the second exhaust vent 111. When it is necessary to humidify the refrigerating chamber 21, the first fan 53 is controlled to start, and the first shielding member 503 may open the first exhaust vent 121 under the action of wind power from the first fan 53. In this way, wet air atomized by the humidifying apparatus 50 may enter the refrigerating chamber 21 from the first exhaust vent 121. When it is necessary to discharge water in the water storage box 40, the second fan 54 is controlled to start, and the second shielding member 504 may open the second exhaust vent 111 under the action of wind power from the second fan 54. In this way, wet air atomized by the humidifying apparatus 50 may be discharged to the outside of the refrigerator from the second exhaust vent 111. The humidifying apparatus can mainly perform refrigeration and humidification, and is started to exhaust moisture to the outside environment only when the refrigerating chamber 21 does not need to be humidified and the quantity of water in the water storage box 40 is higher than a preset value, for the purpose of discharging redundant water in the water storage box 40. The first shielding member 503 and the second shielding member 504 may reset under their own gravity or elasticity after wind power of the fan is removed. Of course, it is also possible to actively humidify the external environment based on user's settings, so that when it happens to be necessary to humidify the refrigerating chamber 21, the first fan 53 and the second fan 54 can be controlled to start simultaneously.

[0040] Further, a dispenser is arranged on the outer side of the door body 10. The dispenser 112 selectively

discharges ice made by the ice-making assembly 100. A dispenser groove 113 is formed in the door shell 11 of the door body 10. The second exhaust vent 111 may be arranged at one side of the dispenser groove 113. Of course, in order not to adversely affect the appearance of the door body, the second exhaust vent 111 may also be arranged in the dispenser groove 113, for example, at the bottom of the dispenser groove 113.

[0041] Referring to FIGs. 7 to 11, in another preferred embodiment, a moisturizing drawer 25 is arranged in the refrigerating chamber 21. The moisturizing drawer 25 may be configured as a relatively closed space relative to the refrigerating chamber 21, and is only opened as required by the user. Similar to the first embodiment, the ice-making chamber 13 is arranged on the door body 10. The door body 10 is provided with a drainage pipeline 30. An inlet end 31 of the drainage pipeline 30 is connected to the ice-making chamber 13. The door body 10 is further provided with a water storage box 40a and a humidifying apparatus 50 communicated with the water storage box 40a. An outlet end 31 of the drainage pipeline 30 leads to the water storage box 40a. The cabinet body is provided with an exhaust passage 26 communicated with the moisturizing drawer 25. A first exhaust vent 121a and a second exhaust vent 111 are arranged on the inner side and the opposite outer side of the door body 10, respectively. The first exhaust vent 121a is communicated with the exhaust passage 26 when the door body 10 is closed. The humidifying apparatus 50 is selectively communicated with the first exhaust vent 121a to humidify the moisturizing drawer 25 or communicated with the second exhaust vent 111. Thus, defrosting water discharged from the ice-making chamber 13 may be consumed by means of humidification and selectively used to humidify the moisturizing drawer 25 or discharged to the outside environment, thereby avoiding cleaning by a user and bringing convenience to the user.

[0042] A humidity sensor is arranged in the moisturizing drawer 25. The refrigerator includes a controller connected to both of the humidity sensor and the humidifying apparatus 50. When the humidity detected by the humidity sensor is lower than a preset value, the controller starts up the humidifying apparatus 50, and the humidifying apparatus 50 is communicated with the first exhaust vent 121a and disconnected from the second exhaust vent 111. In this way, the moisturizing drawer 25 may be humidified using the collected ice-making defrosting water, which saves resources and is convenient for the user. Further, the door body 10 is further provided with a water level sensor for detecting the quantity of water in the water storage box 40. The refrigerator includes a controller connected to both of the water level sensor and the humidifying apparatus. When the water level detected by the water level sensor is higher than a preset value, the controller starts up the humidifying apparatus, and the humidifying apparatus 50 is communicated with the second exhaust vent 111 and disconnected from the first exhaust vent 121a, so that the ice-making defrosting wa-

ter can be discharged to the outside of the refrigerator in time. The humidifying apparatus 50 is selectively communicated with the first exhaust vent 121a or the second exhaust vent 111, so that the defrosting water in the ice-making chamber 13 can be reused or discharged to the outside of the refrigerator, thereby avoiding cleaning by the user and improving the user experience.

[0043] The specific structure of the humidifying apparatus 50 is the same as that of the first embodiment, and thus may not be repeated herein. Their difference lies in that the water storage box 40a can only shield a part of the opening of the cavity while the other part of the opening forms the first exhaust vent, or one side wall of the water storage box 40a extends downwards to form a cover plate 41a, the cover plate 41 covers the humidifying apparatus, and the second exhaust vent 121a is arranged on the cover plate 41a of the water storage box 40a, so that when the door body is closed, the first exhaust vent 121a can be communicated with the exhaust passage 25. The exhaust passage 26 includes an air inlet 261 and an air outlet. The air inlet 261 is arranged on the side wall of the refrigerating chamber 21 close to the pivoting side of the door body, and the air outlet is communicated with the moisturizing drawer 25. The exhaust passage 26 extends backwards from one side of the refrigerating chamber 21 and enters the moisturizing drawer 25 from the rear of the refrigerating chamber 21.

[0044] In the refrigerator according to the above embodiments, the humidifying apparatus is selectively communicated with the first exhaust vent or the second exhaust vent, so that defrosting water in the ice-making chamber can be reused to humidify the refrigerating chamber and the moisturizing drawer or be discharged to the outside of the refrigerator, thereby avoiding cleaning by the user. In addition, the functions of the refrigerator can be increased without increasing the cost, which improves the user experience.

[0045] It should be understood that although the Description is described according to the embodiments, not each embodiment includes only one independent technical solution, such a description manner is only for the sake of clarity, those skilled in the art should take the Description as an integral part, and the technical solutions in the embodiments may be suitably combined to form other embodiments understandable by those skilled in the art.

[0046] The detailed descriptions set forth above are merely specific illustrations of feasible embodiments of the present invention, and are not intended to limit the scope of protection of the present invention. All equivalent embodiments or modifications that do not depart from the art spirit of the present invention should fall within the scope of protection of the present invention.

Claims

1. A refrigerator, comprising:

- a cabinet body, the cabinet body defining a refrigerating chamber, and a moisturizing drawer being arranged in the refrigerating chamber;
 a door body pivotally connected to the cabinet body and configured to open and close the refrigerating chamber;
 a refrigeration system configured to provide cold energy for the refrigerating chamber; and
 an ice-making chamber arranged in the door body and having an ice-making assembly arranged therein, the ice-making chamber and the refrigerating chamber being heat-insulated when the door body is closed,
 wherein the door body is provided with a drainage pipeline; an inlet end of the drainage pipeline is connected to the ice-making chamber; the door body is further provided with a water storage box and a humidifying apparatus communicated with the water storage box; an outlet end of the drainage pipeline leads to the water storage box; the cabinet body is provided with an exhaust passage communicated with the moisturizing drawer; a first exhaust vent and a second exhaust vent are arranged on an inner side and an opposite outer side of the door body, respectively; when the door body is closed, the first exhaust vent is communicated with the exhaust passage; and the humidifying apparatus is selectively communicated with the first exhaust vent to humidify the moisturizing drawer or communicated with the second exhaust vent.
2. The refrigerator according to claim 1, wherein a humidity sensor is arranged in the moisturizing drawer; the refrigerator comprises a controller connected to both of the humidity sensor and the humidifying apparatus; when a humidity detected by the humidity sensor is lower than a preset value, the controller starts up the humidifying apparatus, and the humidifying apparatus is communicated with the first exhaust vent and disconnected from the second exhaust vent.
 3. The refrigerator according to claim 1, wherein the door body is further provided with a water level sensor for detecting the quantity of water in the water storage box; the refrigerator comprises a controller connected to both of the water level sensor and the humidifying apparatus; when a water level detected by the water level sensor is higher than a preset value, the controller starts up the humidifying apparatus, and the humidifying apparatus is communicated with the second exhaust vent and disconnected from the first exhaust vent.
 4. The refrigerator according to claim 3, wherein the water storage box is detachably mounted on the door body; a display panel is arranged on an outer side of the door body; the display panel is connected to the controller; and the controller controls the display panel to display when the water level detected by the water level sensor is lower than the preset value.
 5. The refrigerator according to claim 1, wherein the door body comprises a door shell and a door liner combined with the door shell; the door liner comprises a back surface facing the refrigerating chamber and two side surfaces connected to both of the back surface and the door shell; the first exhaust vent is arranged on the side surface of the door liner close to a pivoting side of the door body; the second exhaust vent is arranged on the door shell; and the water storage box and the humidifying apparatus are embedded between the door liner and the door shell.
 6. The refrigerator according to claim 1, wherein the door body is provided with a cavity; the humidifying apparatus is mounted at the bottom of the cavity; the water storage box is detachably mounted in the cavity and located above the humidifying apparatus; one side wall of the water storage box extends downwards to form a cover plate; the cover plate covers the humidifying apparatus; the water storage box shields an opening of the cavity; and the first exhaust vent is arranged on the cover plate.
 7. The refrigerator according to claim 1, wherein a filtering module is arranged between the outlet end of the drainage pipeline and the water storage box, and the filtering module is mounted in the water storage box.
 8. The refrigerator according to claim 1, wherein the humidifying apparatus comprises an atomizing module connected to the water storage box and a fan adjacent to the atomizing module, and the humidifying apparatus is selectively communicated with the first exhaust vent or the second exhaust vent by controlling the fan.
 9. The refrigerator according to claim 8, wherein the fan comprises a first fan of which an exhaust direction faces the first exhaust vent, and a second fan of which an exhaust direction faces the second exhaust vent, and either of the first fan and the second fan is started to be selectively communicated with the first exhaust vent or the second exhaust vent.
 10. The refrigerator according to claim 1, wherein a dispenser is arranged on an outer side of the door body; the dispenser selectively discharges ice made by the ice-making assembly; a dispenser groove is formed in a shell of the door body; and the second exhaust vent is arranged in the dispenser groove.
 11. The refrigerator according to claim 1, further com-

prising an ice-making assembly arranged in the ice-making chamber, the ice-making assembly comprising:

an ice mold, the ice mold being provided with a plurality of ice cube trays for containing ice-making water;
a refrigerant pipe extending from one end of the ice mold to the other end and located at a bottom of the ice mold, the refrigerant pipe being connected to the refrigeration system;
a heating wire fixed to the bottom of the ice mold and spaced from the refrigerant pipe; and
a drain tray connected below the ice mold, a water outlet being formed at one end of the drain tray, and the water outlet being inserted into the inlet end of the drainage pipeline.

12. A refrigerator, comprising:

a cabinet body, the cabinet body defining a refrigerating chamber;
a door body pivotally connected to the cabinet body and configured to open and close the refrigerating chamber;
a refrigeration system configured to provide cold energy for the refrigerating chamber; and
an ice-making chamber arranged in the door body and having an ice-making assembly arranged therein, the ice-making chamber and the refrigerating chamber being heat-insulated when the door body is closed,
wherein the door body is provided with a drainage pipeline; an inlet end of the drainage pipeline is connected to the ice-making chamber; the door body is further provided with a water storage box and a humidifying apparatus communicated with the water storage box; an outlet end of the drainage pipeline leads to the water storage box; a first exhaust vent and a second exhaust vent are arranged on an inner side, facing the refrigerating chamber, and an opposite outer side of the door body, respectively; and the humidifying apparatus is selectively communicated with the first exhaust vent to humidify the refrigerating chamber and/or communicated with the second exhaust vent.

13. The refrigerator according to claim 12, wherein the humidifying apparatus comprises an atomizing module connected to the water storage box and a fan adjacent to the atomizing module, and the humidifying apparatus is selectively communicated with the first exhaust vent or the second exhaust vent by controlling the fan.

14. The refrigerator according to claim 13, wherein the fan comprises a first fan of which an exhaust direction

faces the first exhaust vent, and a second fan of which an exhaust direction faces the second exhaust vent, and either of the first fan and the second fan is started to be selectively communicated with the first exhaust vent or the second exhaust vent.

15. The refrigerator according to claim 12, wherein a dispenser is arranged on an outer side of the door body; the dispenser selectively discharges ice made by the ice-making assembly; a dispenser groove is formed in a housing of the door body; and the second exhaust vent is arranged in the dispenser groove.

16. The refrigerator according to claim 12, wherein the door body comprises a door shell and a door liner combined with the door shell; the door liner comprises a back surface facing the refrigerating chamber and two side surfaces connected to both of the back surface and the door shell; the first exhaust vent is arranged on the back surface of the door liner; the second exhaust vent is arranged on the door shell; and the water storage box and the humidifying apparatus are embedded between the door liner and the door shell from the side surface of the door liner close to a pivoting side of the door body.

17. The refrigerator according to claim 12, wherein the door body is provided with a cavity; the humidifying apparatus is mounted at a bottom of the cavity; the water storage box is detachably mounted in the cavity and located above the humidifying apparatus; one side wall of the water storage box extends downwards to form a cover plate; the cover plate covers the humidifying apparatus; and the water storage box shields an opening of the cavity.

18. The refrigerator according to claim 12, wherein a filtering module is arranged between the outlet end of the drainage pipeline and the water storage box, and the filtering module is mounted in the water storage box.

19. The refrigerator according to claim 12, wherein a humidity sensor is arranged in the refrigerating chamber; the refrigerator comprises a controller connected to both of the humidity sensor and the humidifying apparatus; when a humidity detected by the humidity sensor is lower than a preset value, the controller starts up the humidifying apparatus and the humidifying apparatus is communicated with the first exhaust vent and disconnected from the second exhaust vent; the door body is further provided with a water level sensor for detecting the quantity of water in the water storage box; the refrigerator comprises a controller connected to both of the water level sensor and the humidifying apparatus; when a water level detected by the water level sensor is higher than a preset value, the controller starts up the humidify-

ing apparatus, and the humidifying apparatus is communicated with the second exhaust vent and disconnected from the first exhaust vent.

20. The refrigerator according to claim 19, wherein the 5
water storage box is detachably mounted on the door
body; a display panel is arranged on an outer side
of the door body; the display panel is connected to
the controller; and the controller controls the display 10
panel to display when the water level detected by
the water level sensor is lower than the preset value.

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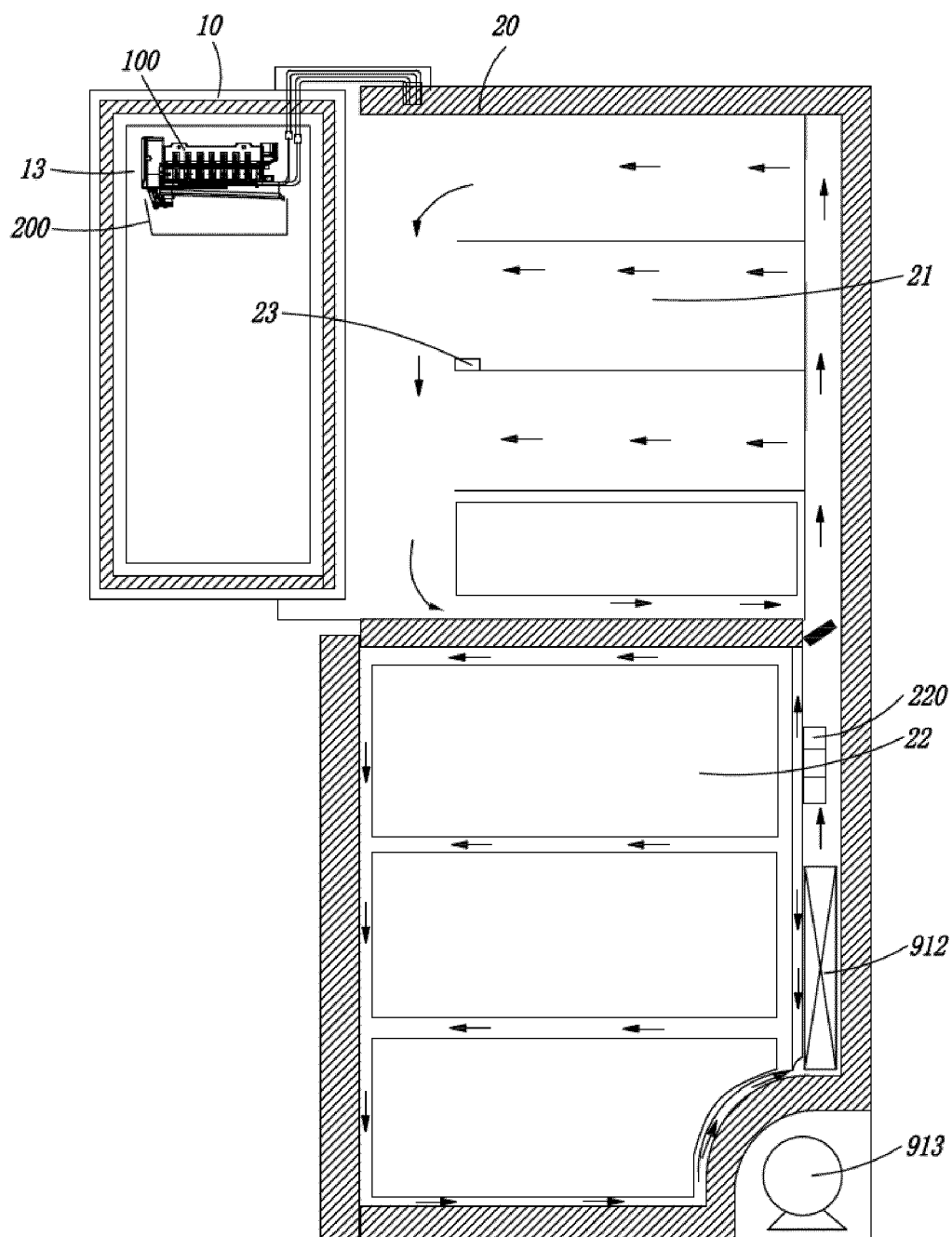


FIG. 1

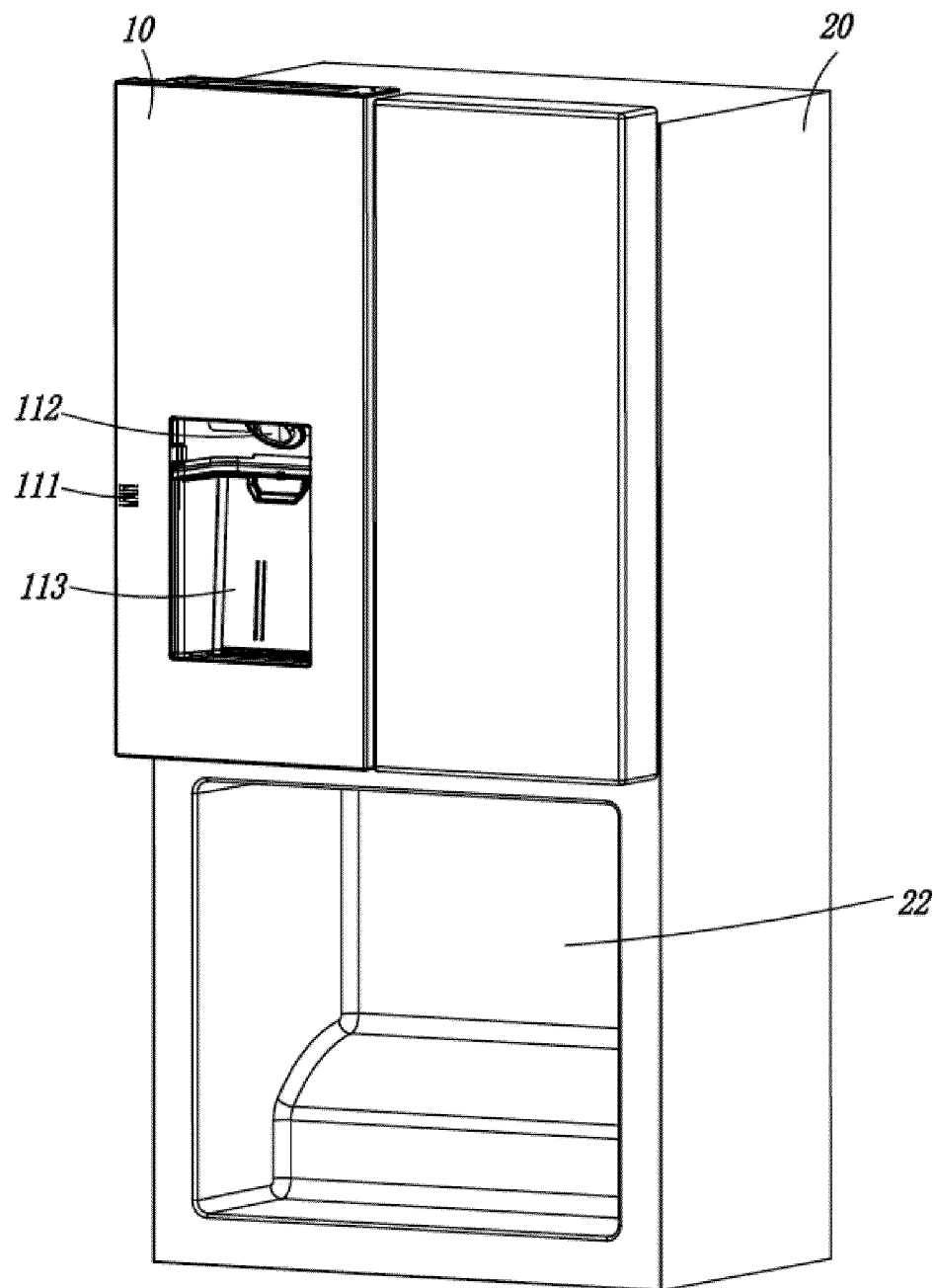


FIG. 2

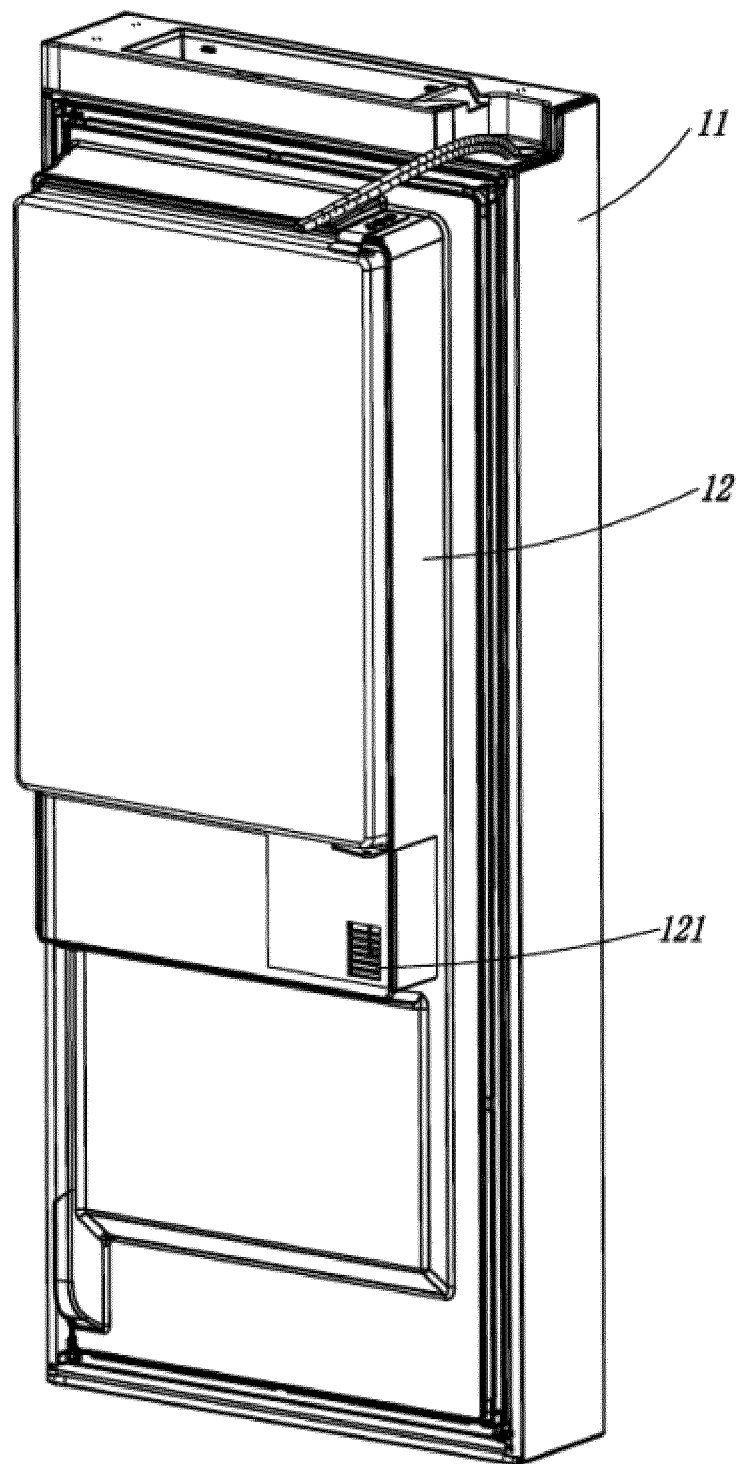


FIG. 3

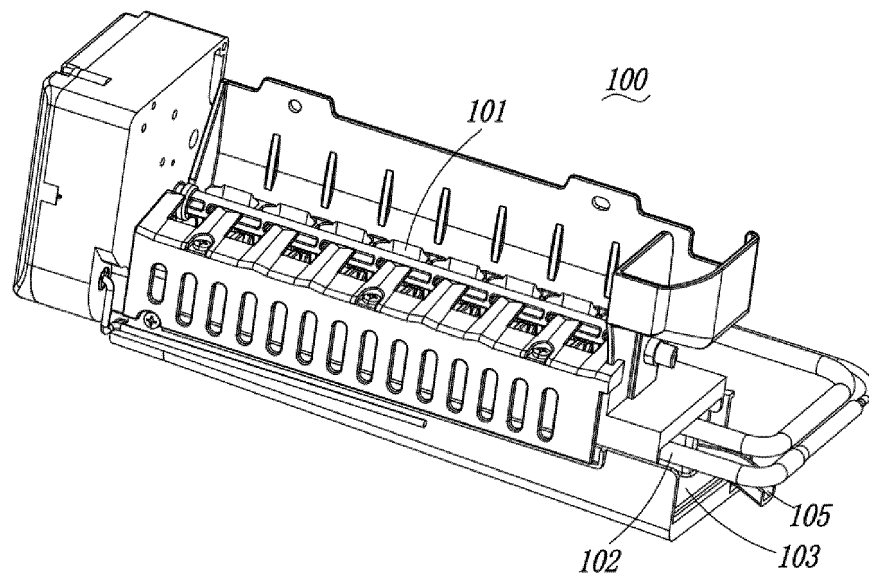


FIG. 4

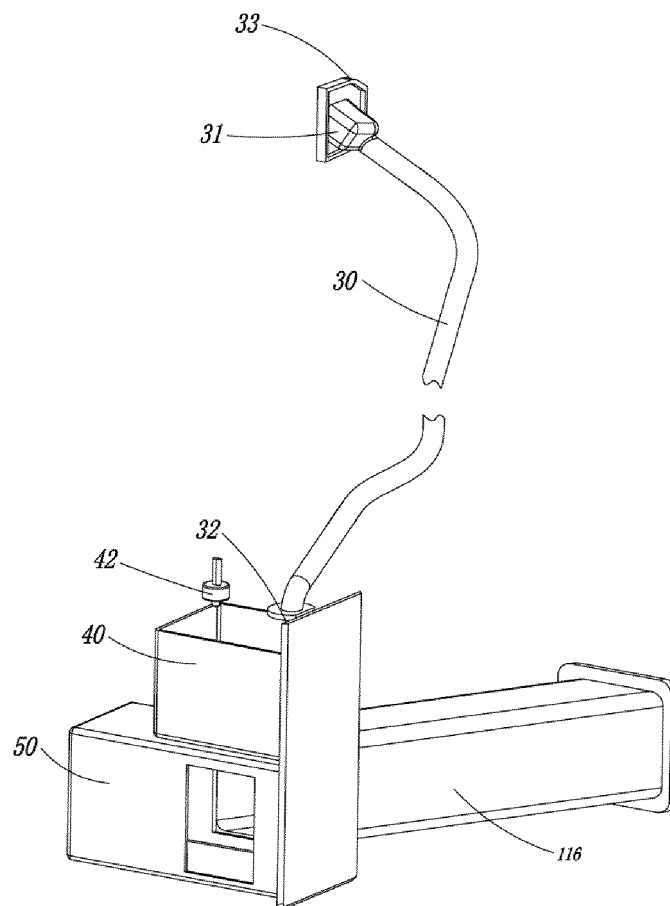


FIG. 5

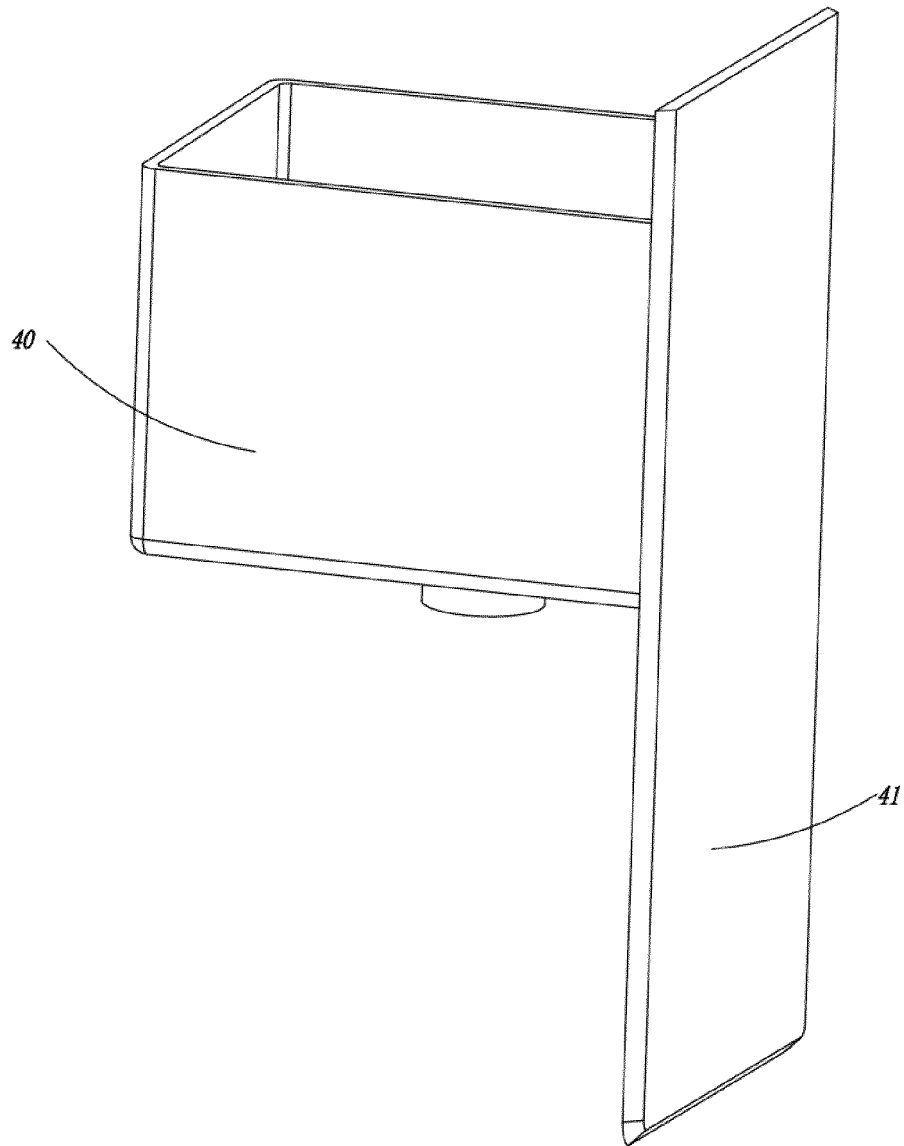


FIG. 6

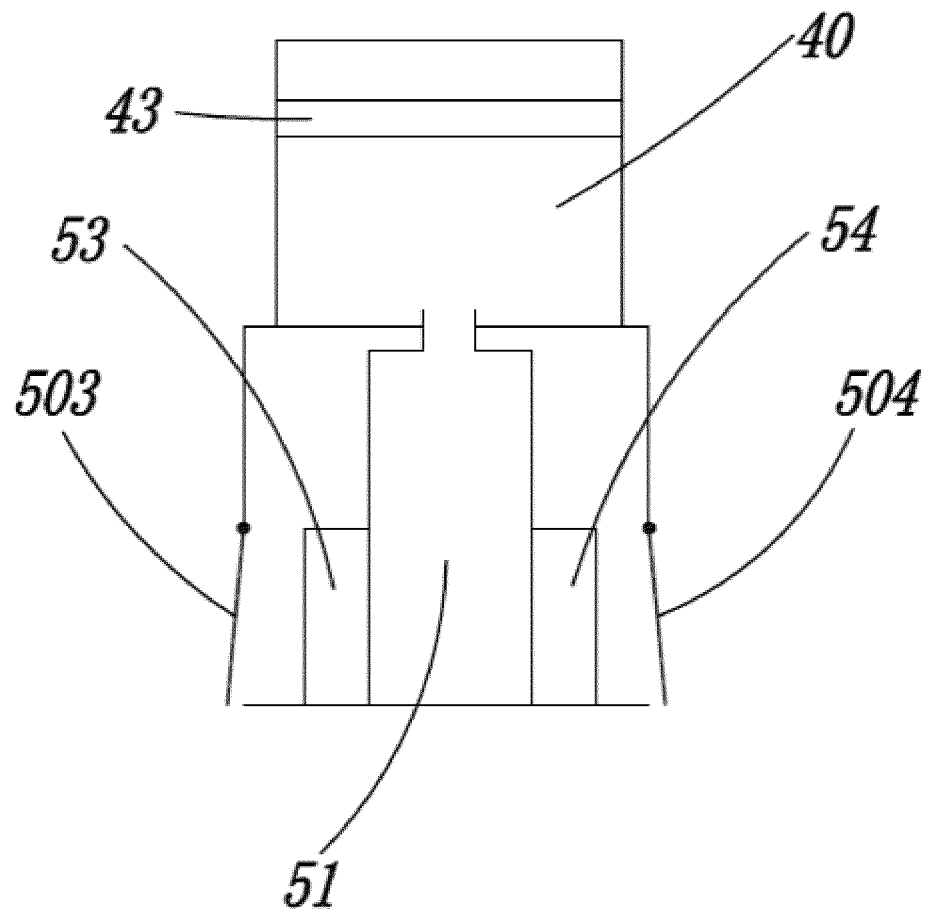


FIG. 7

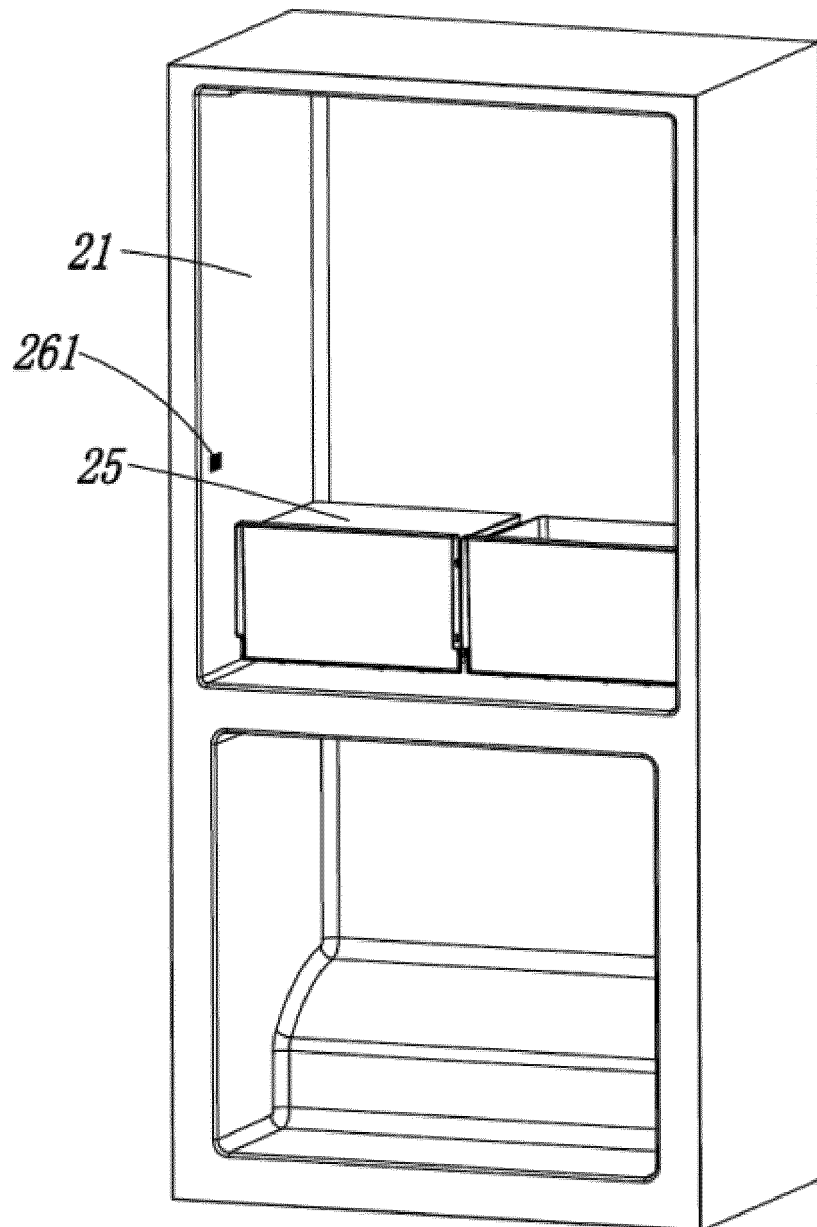


FIG. 8

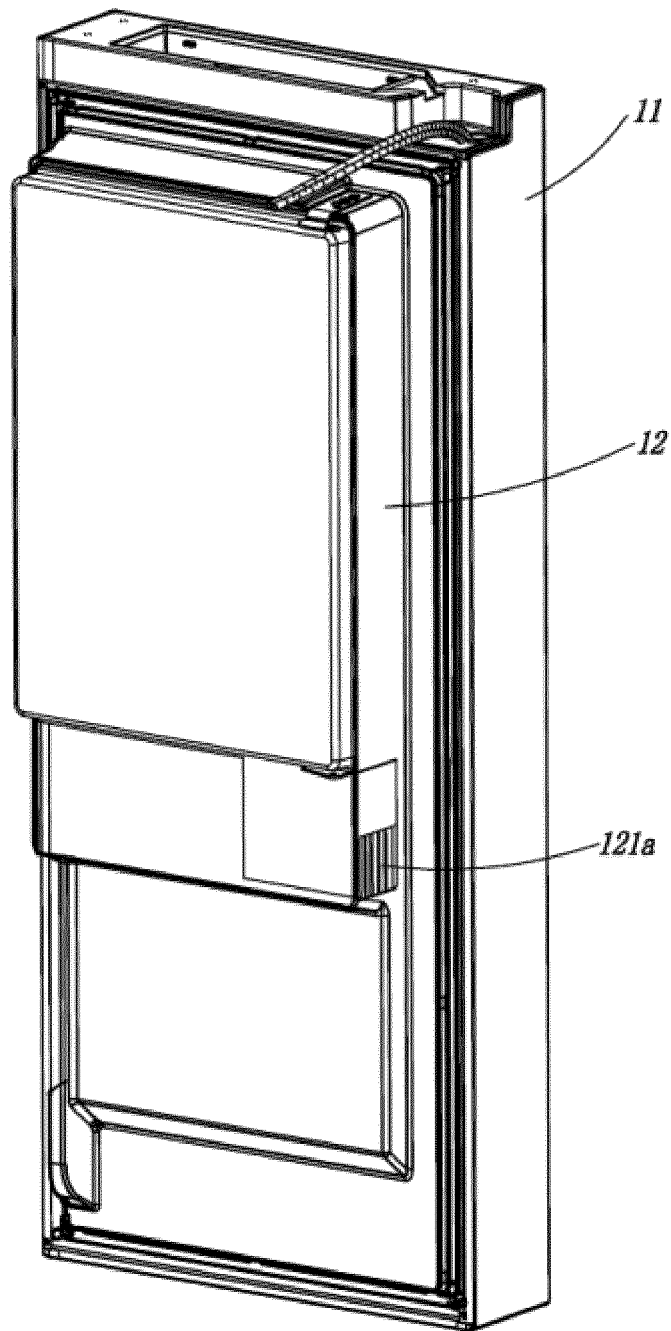


FIG. 9

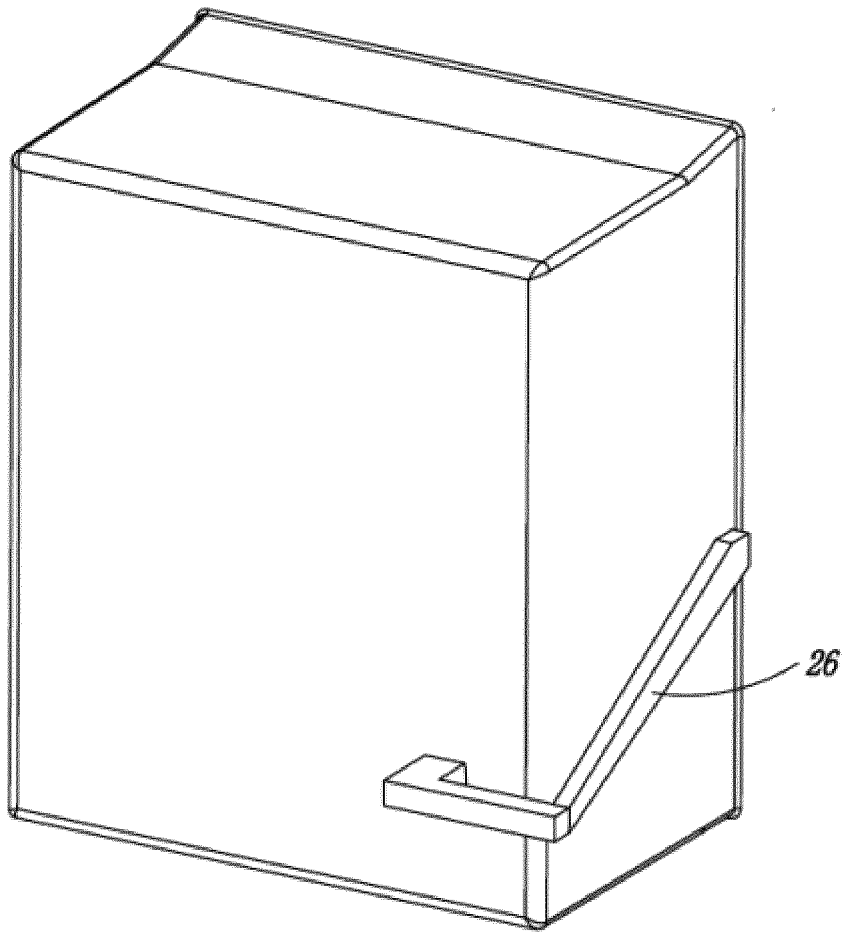


FIG. 10

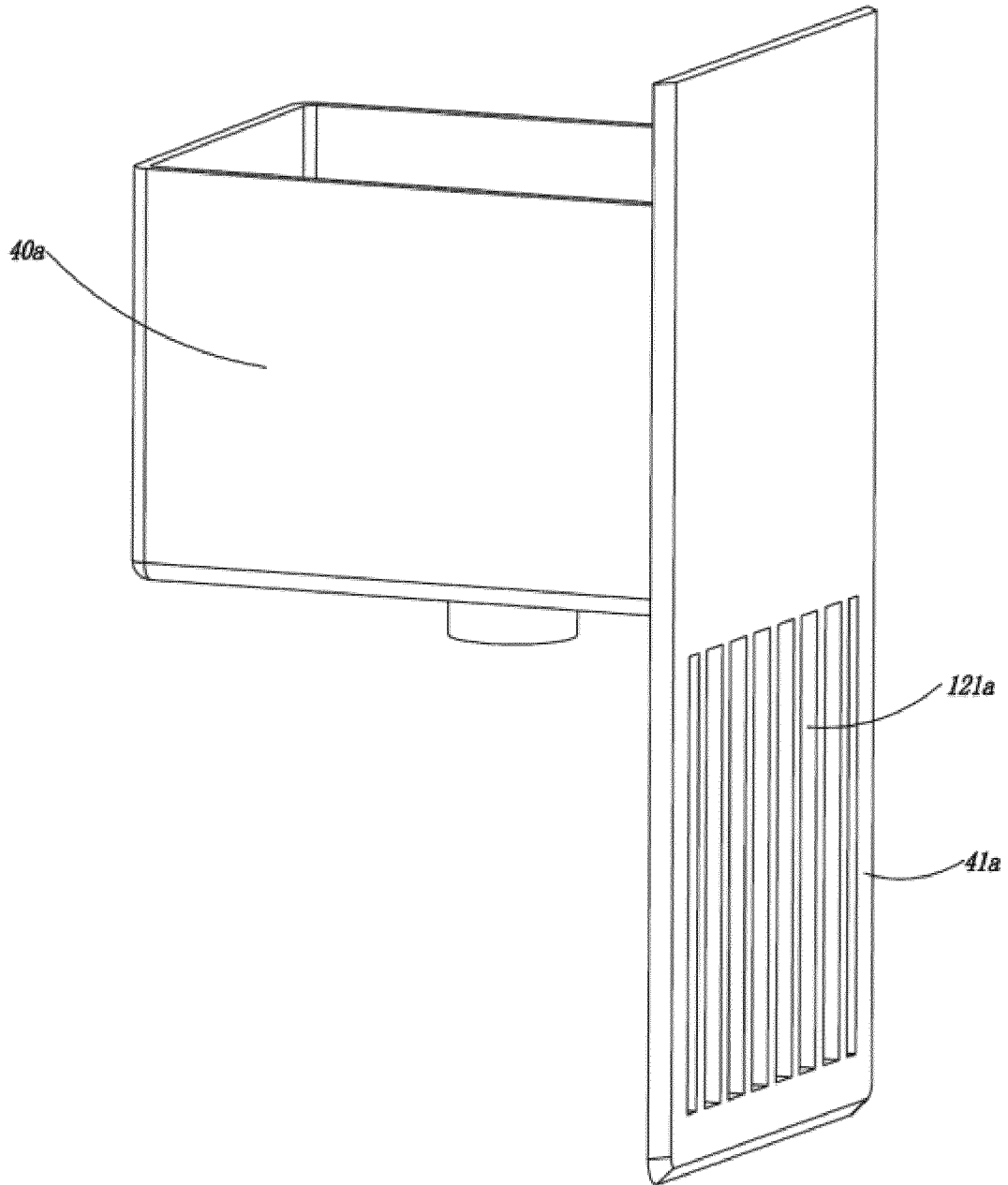


FIG. 11

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/143130

A. CLASSIFICATION OF SUBJECT MATTER

F25D 21/14(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)

F25D21/14, F25D21/00, F25D23/00, F25C1/00

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; VEN; CNTXT; USTXT; CNKI: 海尔, 张延庆, 赵振雨, 张方友, 宋向鹏, 牟国梁, 朱小兵, 冰箱, 门, 抽屉, 制冰, 排水, 蓄水, 加湿, 排气, refrigerator, door, drawer, ice mak+, drain+, water storage, humidifying, exhaust

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2016025399 A1 (GENERAL ELECTRIC COMPANY) 28 January 2016 (2016-01-28) description, paragraphs [0001]-[0055] and figures 1-9	1-20
A	CN 107270650 A (QINGDAO HAIER CO., LTD.) 20 October 2017 (2017-10-20) entire document	1-20
A	CN 110274417 A (QINGDAO HAIER CO., LTD.) 24 September 2019 (2019-09-24) entire document	1-20
A	CN 203443231 U (CHIKO TECHNOLOGY CO., LTD.) 19 February 2014 (2014-02-19) entire document	1-20
A	CN 104457097 A (HENAN XINFEI ELECTRIC CO., LTD.) 25 March 2015 (2015-03-25) entire document	1-20
A	US 2012228786 A1 (WANG YUZHONG et al.) 13 September 2012 (2012-09-13) entire document	1-20

☐ 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

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“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

25 February 2022

Date of mailing of the international search report

08 March 2022

Name and mailing address of the ISA/CN

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Facsimile No. (86-10)62019451

Authorized officer

Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2021/143130

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
US 2016025399 A1	28 January 2016	US 10502477 B2	10 December 2019
CN 107270650 A	20 October 2017	None	
CN 110274417 A	24 September 2019	None	
CN 203443231 U	19 February 2014	None	
CN 104457097 A	25 March 2015	None	
US 2012228786 A1	13 September 2012	CN 201540004 U	04 August 2010
		US 8998177 B2	07 April 2015
		WO 2011060722 A1	26 May 2011

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