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(71) Applicants:
• **Qingdao Haier Refrigerator Co., Ltd**
Qingdao, Shandong 266101 (CN)
• **Haier Smart Home Co., Ltd.**
Qingdao, Shandong 266101 (CN)

(72) Inventors:
• **ZHAO, Zhenyu**
Qingdao, Shandong 266101 (CN)
• **ZHANG, Yanqing**
Qingdao, Shandong 266101 (CN)
• **XUE, Jianjun**
Qingdao, Shandong 266101 (CN)
• **DU, Qihai**
Qingdao, Shandong 266101 (CN)
• **ZHANG, Fangyou**
Qingdao, Shandong 266101 (CN)
• **CUI, Chuan**
Qingdao, Shandong 266101 (CN)

(74) Representative: **Lavoix**
Bayerstraße 83
80335 München (DE)

(54) **REFRIGERATOR**

(57) Disclosed is a refrigerator, comprising: a cabinet in which a storage space is formed; a storage chamber door pivotally connected to the cabinet and configured to open or close the storage space; wherein the refrigerator further comprises an ice making chamber which is formed on a front surface of the storage chamber door and inwardly recessed to receive an ice maker and an ice bin; a dispenser disposed at the front surface of the storage chamber door and configured to dispense ice from the ice bin; an ice making chamber door mounted to the front surface of the storage chamber door and configured to open or close the ice making chamber; an auxiliary door pivotally connected to the storage chamber door or the ice making chamber door and completely covering the dispenser.

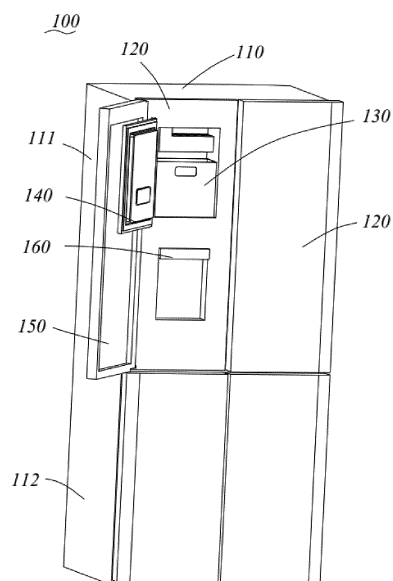


FIG.1

Description

TECHNICAL FIELD

[0001] The present invention relates to household electrical appliance, and particularly to a refrigerator.

BACKGROUND

[0002] To satisfy users' pluralistic demands, a door of a refrigerator is usually provided with an ice making chamber for mounting an ice maker and a dispenser for dispensing ice. Usually, the ice making chamber has an opening towards the interior of the cabinet of the refrigerator, and an ice making chamber door for opening or closing the ice making chamber is mounted at the opening. When the user needs to repair the ice maker or take a large amount of ice, he needs to open the door of the refrigerator and then open the door of the ice making chamber, which is prone to cause leakage of a large amount of cold air from the interior of the cabinet of the refrigerator; furthermore, the dispenser is generally exposed out of the refrigerator, and external dust is apt to enter the dispenser and cause contamination.

SUMMARY

[0003] The present invention provides a refrigerator which is capable of reducing leakage of cold air from the interior of the cabinet of the refrigerator and meanwhile preventing external pollutants such as dust from entering the dispenser, by providing an ice making chamber door and an auxiliary door on a front surface of the storage chamber door of the refrigerator.

[0004] To achieve the object, the present invention provides a refrigerator, comprising:

a cabinet in which a storage space is formed;
a storage chamber door pivotally connected to the cabinet and configured to open or close the storage space;
wherein the refrigerator further comprises an ice making chamber which is formed on a front surface of the storage chamber door and inwardly recessed to receive an ice maker and an ice bin;
a dispenser disposed at the front surface of the storage chamber door and configured to discharge ice from the ice bin;
an ice making chamber door mounted to the front surface of the storage chamber door and configured to open or close the ice making chamber;
an auxiliary door pivotally connected to the storage chamber door or the ice making chamber door and completely covering the dispenser.

[0005] A further improvement as an embodiment of the present invention, wherein a pivot axis of the auxiliary door is parallel to the pivot axis of the storage chamber

door.

[0006] A further improvement as an embodiment of the present invention, wherein the auxiliary door is pivotally connected to the storage chamber door and completely covers the front surface of the ice making chamber door and the storage chamber door.

[0007] A further improvement as an embodiment of the present invention, wherein the ice making chamber door is pivotally mounted to the storage chamber door, and a pivot axis of the ice making chamber door is parallel to the pivot axis of the storage chamber door.

[0008] A further improvement as an embodiment of the present invention, wherein the ice making chamber door is pivotally mounted to the storage chamber door, and a pivot axis of the ice making chamber door is perpendicular to the pivot axis of the storage chamber door.

[0009] A further improvement as an embodiment of the present invention, wherein the auxiliary door is pivotally connected to the storage chamber door and completely covers the front surface of the storage chamber door, and the auxiliary door is provided with an ice chamber opening corresponding to the ice making chamber.

[0010] A further improvement as an embodiment of the present invention, wherein the ice making chamber door covers a front surface of the storage chamber door and has an ice-dispensing opening, and the auxiliary door is pivotally connected to the ice making chamber door and configured to open or close the ice-dispensing opening.

[0011] A further improvement as an embodiment of the present invention, wherein the storage chamber door and the ice making chamber door both have a heat insulating layer, and the auxiliary door is configured to limit heat insulation.

[0012] A further improvement as an embodiment of the present invention, wherein the storage space comprises a refrigerating chamber and a freezing chamber located below the refrigerating chamber, an ice making evaporation chamber and a freezing evaporation chamber are disposed in the freezing chamber, the freezing evaporation chamber can communicate with the storage space, and the ice making evaporation chamber is communicated with the ice making chamber through an ice making air duct.

[0013] A further improvement as an embodiment of the present invention, wherein the ice making air duct is disposed on a sidewall of the cabinet and comprises an air supply duct and an air return duct, an air supply inlet of the air supply duct and an air return outlet of the air return duct are both disposed on the sidewall of the cabinet, and the ice making chamber is provided with an ice making air inlet and an ice making air outlet corresponding to the air supply inlet and the air return outlet respectively; when the storage chamber door is closed, the air supply inlet and the air return outlet are respectively connected to the ice making air inlet and the ice making air outlet to supply cold air to the ice making chamber.

[0014] With the ice making chamber door and the auxiliary door being provided on the external surface of the

storage chamber door, the refrigerator according to the present invention can prevent dust from entering the dispenser while reducing the leakage of cold air, thereby providing a good experience to the user.

BRIEF DESCRIPTION OF THE DRAWINGS

[0015]

FIG. 1 is a perspective view of a refrigerator in an embodiment of the present invention;
 FIG. 2 is a perspective view of a refrigerator in another embodiment of the present invention;
 FIG. 3 is a perspective view of a refrigerator in a further embodiment of the present invention;
 FIG. 4 is a cross-sectional view of the refrigerator shown in FIG. 1.

DETAILED DESCRIPTION

[0016] Technical solutions in the embodiments of the present invention will be clearly and completely described below with reference to the figures in embodiments of the present invention. Obviously, the described embodiments are merely partial embodiments of the present invention, not all of the embodiments. Based on the embodiments of the present invention, all other embodiments obtained by those having ordinary skill in the art without making inventive efforts fall within the extent of protection of the present invention.

[0017] Referring to FIG. 1, it illustrates a preferred embodiment of a refrigerator 100 according to the present invention. The refrigerator 100 comprises a cabinet 110 and a storage chamber door 120, a storage space is formed in the cabinet 110, and the storage chamber door 120 is pivotally connected to the cabinet 110 to open or close the storage space. Specifically, there are a refrigerating chamber 111 and a freezing chamber 112 disposed under the refrigerating chamber 111 in the cabinet 110, and the storage chamber door 120 comprises a refrigerating chamber door and a freezing chamber door. An ice making chamber 130 is provided on a front surface of the storage chamber door 120, the ice making chamber 130 is inwardly recessed, i.e., the ice making chamber 130 is recessed towards the interior of the cabinet 110, and has an opening facing towards outside the cabinet 110. An ice maker and an ice bin are mounted in the ice making chamber 130, and the ice bin is located below the ice maker and configured to receive ice made by the ice maker. The front surface of the storage chamber door 120 is provided with a dispenser 160 for discharging ice from the ice bin. When the storage chamber door 120 is closed, the user may operate the dispenser 160 to dispense ice.

[0018] The refrigerator 100 further comprises an ice making chamber door 140 and an auxiliary door 150. Both the ice making chamber door 140 and the auxiliary door 150 are mounted on the front surface of the storage

chamber door 120, the ice making chamber door 140 is used to open or close the storage chamber door 120, the auxiliary door 150 is pivotally connected to the storage chamber door 120 and completely covers the front surface of the ice making chamber door 140 and the storage chamber 120. A locking mechanism (not shown) is disposed between the auxiliary door 150 and the storage chamber door 120 to lock the auxiliary door 150 on the storage chamber door 120 such that the user can pull the auxiliary door 150 to drive the storage chamber door 120 to open or close the storage space. When the user uses the dispenser 160 to dispense ice, the user needs to open the auxiliary door 150 first, i.e., operate the locking mechanism to separate the auxiliary door 150 from the storage chamber door 120. By providing the ice making chamber door 140 and the auxiliary door 150 completely covering the storage chamber door 120 on the front surface of the storage chamber door 120, the user can open the auxiliary door 150 and selectively use the dispenser 160 to take ice or open the ice making chamber 130 door 140 to take out the ice bin to take ice, which can reduce the leakage of cold air from the storage space during ice taking. Meanwhile, the auxiliary door 150 can prevent the external dust from entering the ice making chamber 130 and the dispenser 160, which can reduce the user's cleaning times, and prevent ice cubes from being contaminated during ice dispensing.

[0019] Certainly, referring to FIG. 2, the auxiliary door 150 and the ice making chamber door 140 are both pivotally connected to the storage chamber door 120, the auxiliary door 150 and the ice making chamber door 140 are arranged in parallel vertically. Certainly, the auxiliary door 150 may also completely cover the front surface of the storage chamber, an ice chamber opening corresponding to the ice making chamber door 140 is provided on the storage chamber door 120, and the ice making chamber door 140 is exposed to the outside through the ice chamber opening. The auxiliary door 150 and the ice making chamber door 140 are both exposed outside, and the user may selectively open the auxiliary door 150 or the ice making chamber door 140, and operate conveniently.

[0020] Referring to FIG. 3, it may be implemented that the ice making chamber door 140 may also completely cover the front surface of the storage chamber door 120, and an ice dispensing opening 161 may be disposed on the ice making chamber door 140. The user may operate the dispenser 160 to take ice through the ice dispensing opening 161 in a state that the ice making chamber door 140 is closed. Meanwhile, the auxiliary door 150 is disposed at the ice dispensing opening 161 to open or close the ice dispensing opening. The auxiliary door 150 is pivotally connected to the ice making chamber door 140, a locking mechanism is disposed between the auxiliary door 150 and the ice making chamber door 140 to fix the auxiliary door 150 operably and fixedly to the ice making chamber door 140. The user operates the locking mechanism to open the auxiliary door 150 to dispense ice

through the dispenser 160. When the user needs to open the ice making chamber 130, he only needs to open the ice making chamber door 140, which is convenient and quick.

[0021] Furthermore, the auxiliary door 150 and the ice making chamber door 140 are both pivotally connected to the storage chamber door 120, a pivot axis of the auxiliary door 150 is parallel to the pivot axis of the storage chamber door 120 to facilitate installation and manufacture, the pivot axis of the ice making chamber door 140 is parallel to the pivot axis of the storage chamber door 120, and the user can turn in the same turning direction as turning the storage chamber door 120 to open and close the auxiliary door 150 and ice making chamber door 140 with better experience. Certainly, to facilitate the manufacture and installation, the pivot axis of the ice making chamber door 140 may be perpendicular to the pivot axis of the storage chamber door 120.

[0022] Furthermore, both the storage chamber door 120 and the ice making chamber door 140 have a heat insulating layer to prevent leakage of cold air out of the storage space and the ice making chamber 130. Specifically, it is possible to fill a heat-insulating foaming material, or mount a vacuum heat insulating plate, or employ a combination of the two. The auxiliary door 150 is configured to limit the heat insulation, that is, the auxiliary door 150 is not foamed or filled with other heat-insulating materials. Specifically, the auxiliary door 150 may be made of a material such as plastic, metal, transparent glass, thereby reducing the overall thickness of the storage chamber door 120 and the auxiliary door 150.

[0023] Further, referring to FIG. 4, the storage space comprises a refrigerating chamber 111 and a freezing chamber 112 located below the refrigerating chamber 111. An ice making evaporation chamber 170 and a freezing evaporation chamber are disposed in the freezing chamber 112. The freezing evaporation chamber delivers cold air to the storage space. Disposing both the ice making evaporation chamber 170 and the freezing evaporation chamber in the freezing cabinet 110 can prevent the evaporation chamber from delivering cold air to the refrigerating chamber and affecting the ice making effect of the refrigerating chamber.

[0024] Furthermore, an ice making air duct is disposed on a sidewall of the cabinet 110 and comprises an air supply duct 180 and an air return duct 190. An air supply outlet 181 of the air supply duct 180 and an air return inlet 191 of the air return duct 190 are both disposed on the sidewall of the cabinet 110. The ice making chamber is provided with an ice making air inlet 182 and an ice making air outlet 192 corresponding to the air supply inlet and the air return outlet 191, respectively. When the storage chamber door 120 is closed, the air supply inlet and the air return outlet 191 are respectively connected to the ice making air inlet 182 and the ice making air outlet 192 to supply cold air to the ice making chamber 130. The ice making evaporation chamber 170 communicates with the ice making chamber 130 through the ice making

air duct, and only delivers cold air to the ice making chamber 130 to prevent the odor of the food in the storage space from entering the ice making chamber 130.

[0025] It should be understood that although the description is described according to the embodiments, not every embodiment only includes one independent technical solution, that such a description manner is only for the sake of clarity, that those skilled in the art should take the description as an integral part, and that the technical solutions in the embodiments may be suitably combined to form other embodiments understandable by those skilled in the art.

[0026] 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 in which a storage space is formed;
a storage chamber door pivotally connected to the cabinet and configured to open or close the storage space;
wherein the refrigerator further comprises an ice making chamber which is formed on a front surface of the storage chamber door and inwardly recessed to receive an ice maker and an ice bin;
a dispenser disposed at the front surface of the storage chamber door and configured to discharge ice from the ice bin;
an ice making chamber door mounted to the front surface of the storage chamber door and configured to open or close the ice making chamber;
an auxiliary door pivotally connected to the storage chamber door or the ice making chamber door and completely covering the dispenser.

2. The refrigerator according to claim 1, wherein a pivot axis of the auxiliary door is parallel to the pivot axis of the storage chamber door.

3. The refrigerator according to claim 2, wherein the auxiliary door is pivotally connected to the storage chamber door and completely covers the front surface of the ice making chamber door and the storage chamber door.

4. The refrigerator according to claim 3, wherein the ice making chamber door is pivotally mounted to the storage chamber door, and a pivot axis of the ice making chamber door is parallel to the pivot axis of

the storage chamber door.

5. The refrigerator according to claim 3, wherein the ice making chamber door is pivotally mounted to the storage chamber door, and a pivot axis of the ice making chamber door is perpendicular to the pivot axis of the storage chamber door. 5

6. The refrigerator according to claim 2, wherein the auxiliary door is pivotally connected to the storage chamber door and completely covers the front surface of the storage chamber door, and the auxiliary door is provided with an ice chamber opening corresponding to the ice making chamber. 10
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7. The refrigerator according to claim 1, wherein the ice making chamber door covers a front surface of the storage chamber door and has an ice-dispensing opening, and the auxiliary door is pivotally connected to the ice making chamber door and configured to open or close the ice-dispensing opening. 20

8. The refrigerator according to claim 1, wherein the storage chamber door and the ice making chamber door both have a heat insulating layer, and the auxiliary door is configured to limit heat insulation. 25

9. The refrigerator according to claim 1, wherein the storage space comprises a refrigerating chamber and a freezing chamber located below the refrigerating chamber, an ice making evaporation chamber and a freezing evaporation chamber are disposed in the freezing chamber, the freezing evaporation chamber can communicate with the storage space, and the ice making evaporation chamber is communicated with the ice making chamber through an ice making air duct. 30
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10. The refrigerator according to claim 9, wherein the ice making air duct is disposed on a sidewall of the cabinet and comprises an air supply duct and an air return duct, an air supply inlet of the air supply duct and an air return outlet of the air return duct are both disposed on the sidewall of the cabinet, and the ice making chamber is provided with an ice making air inlet and an ice making air outlet corresponding to the air supply inlet and the air return outlet respectively; when the storage chamber door is closed, the air supply inlet and the air return outlet are respectively connected to the ice making air inlet and the ice making air outlet to supply cold air to the ice making chamber. 40
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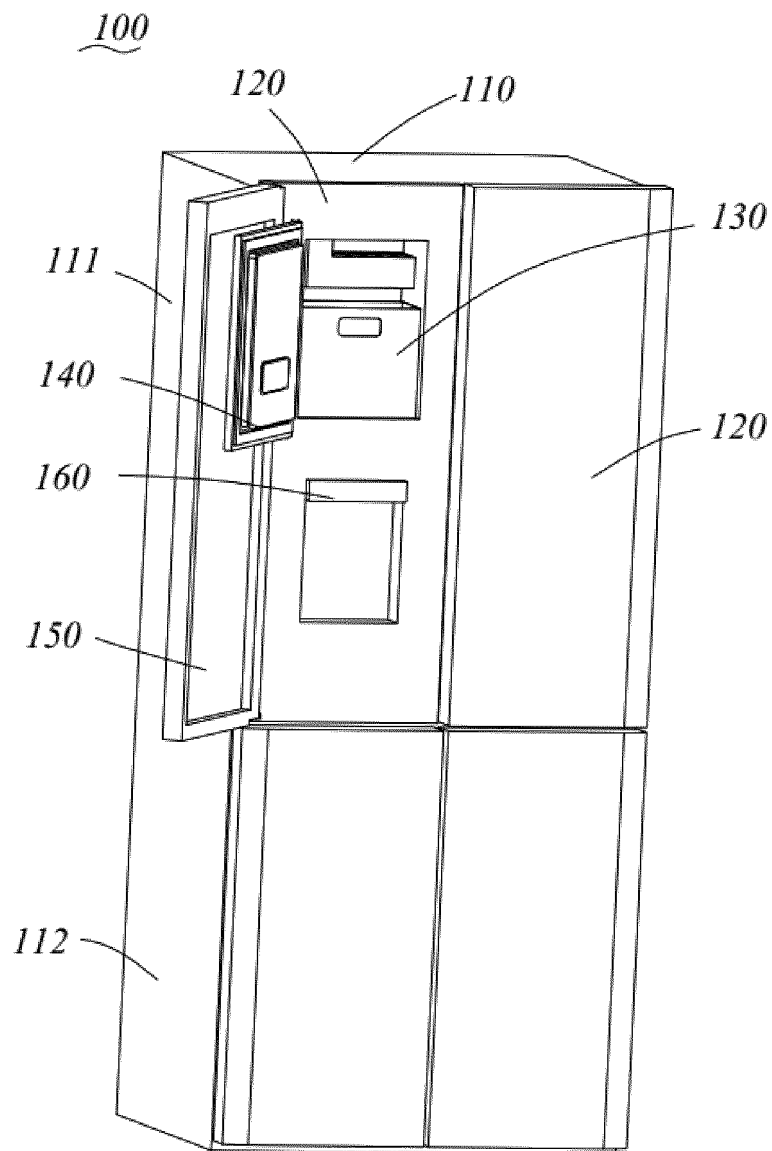


FIG.1

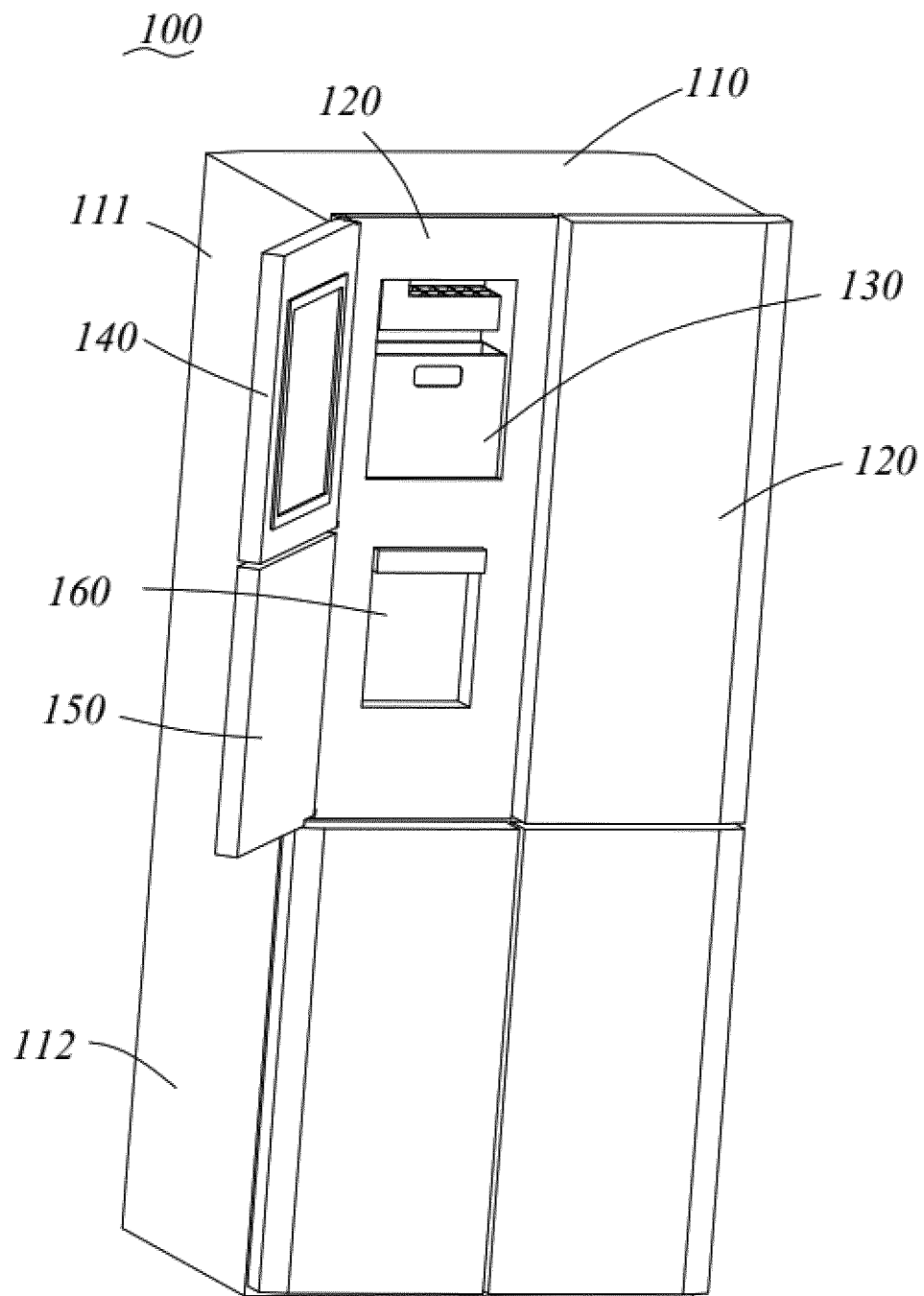


FIG.2

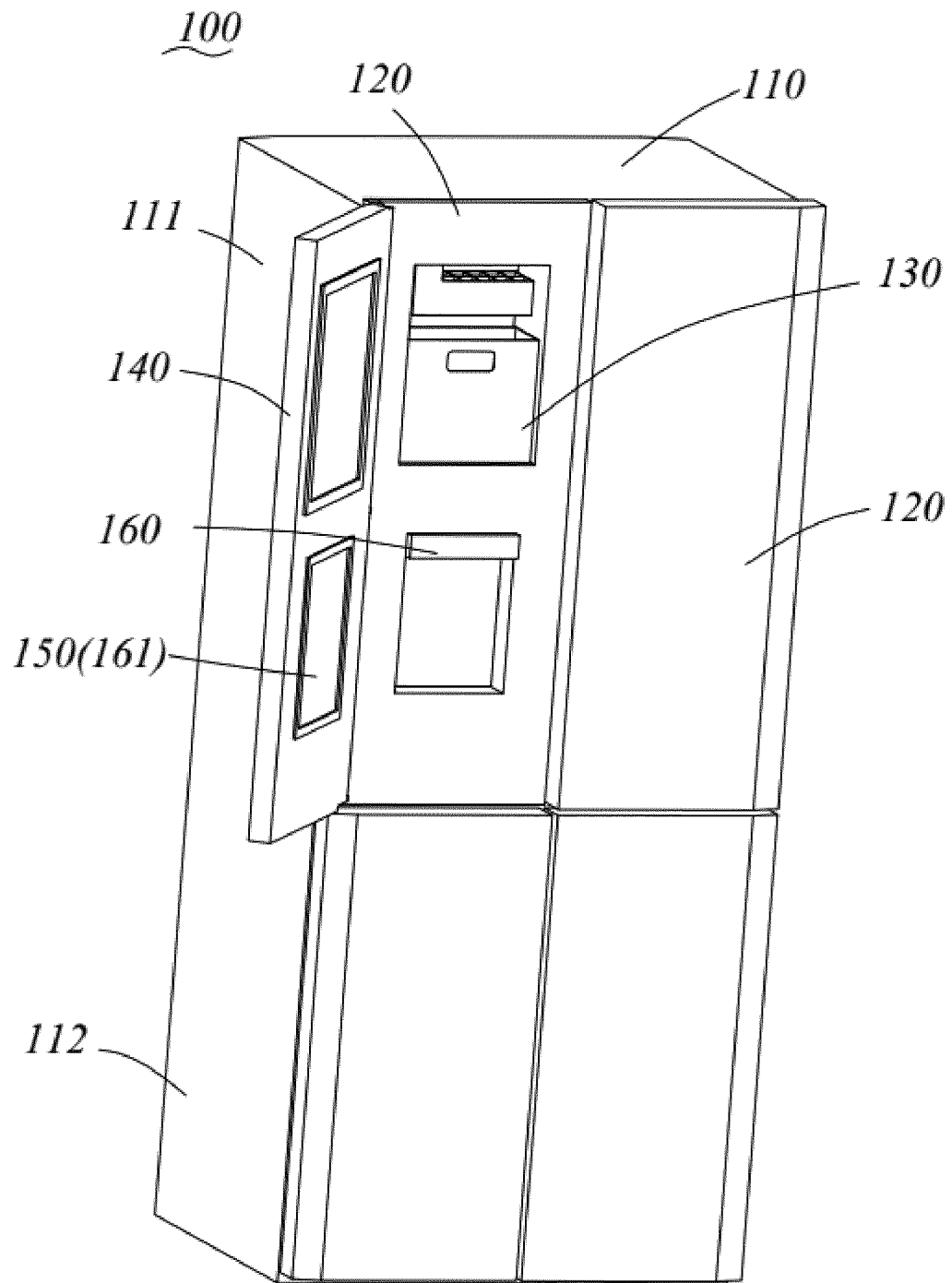


FIG.3

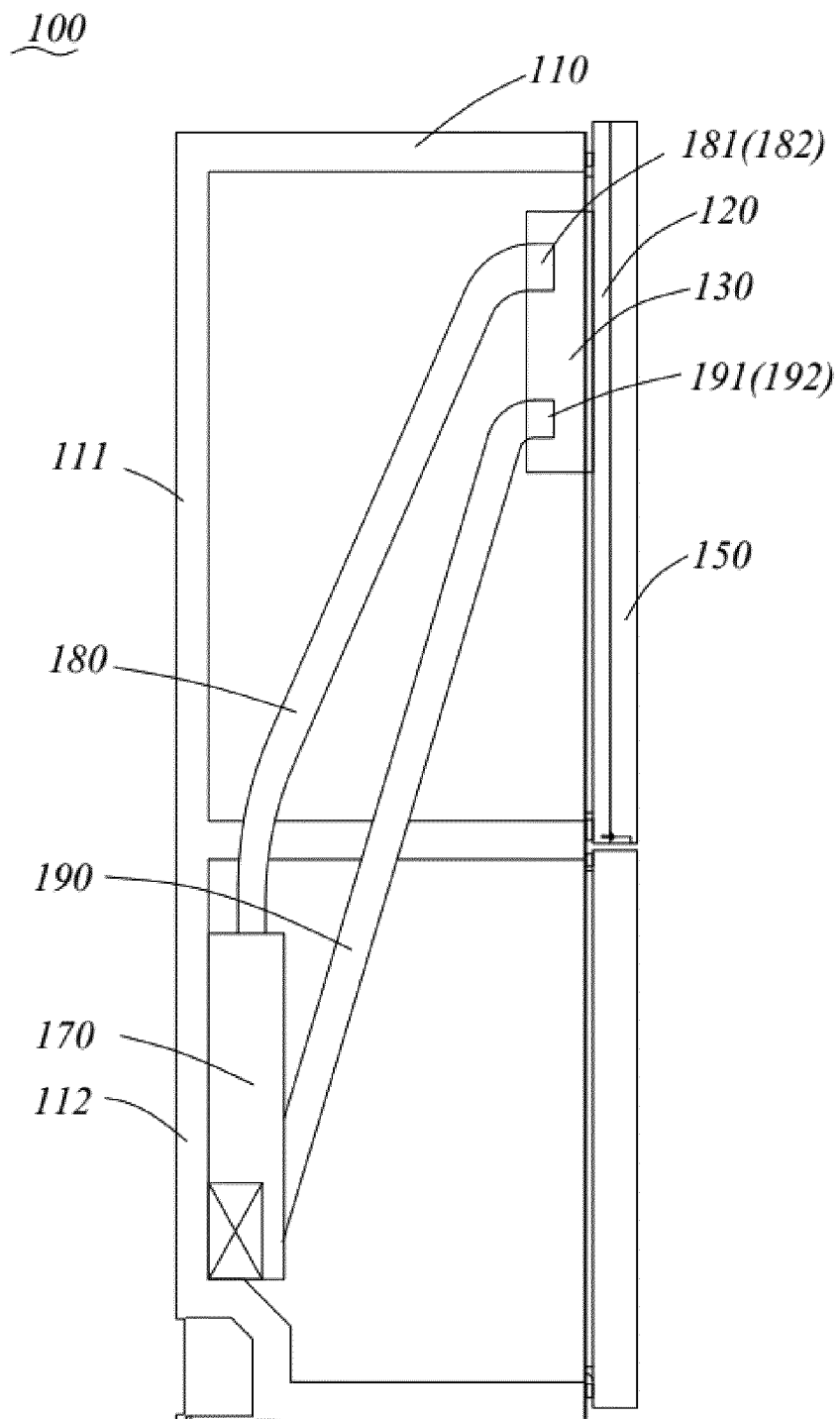


FIG.4

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/095105

A. CLASSIFICATION OF SUBJECT MATTER F25D 23/12(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) F25D23/12; F25D23/00; F25D11/00; F25D13/00; F25C5/00 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, CNTXT, CNKI, VEN: 冰箱, 制冰, 分配, 辅助门, 门; REFRIGERATOR, ICE MAKER, DOOR, SERVING DOOR, AUXILIARY, DISTRIBUTER, ALLOTTER															
C. DOCUMENTS CONSIDERED TO BE RELEVANT															
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>X</td> <td>CN 108180689 A (SAMSUNG ELECTRONICS CO., LTD.) 19 June 2018 (2018-06-19) description, pages 4-7, and figures 1-9</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 102455108 A (SAMSUNG ELECTRONICS CO., LTD.) 16 May 2012 (2012-05-16) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 101226025 A (SAMSUNG ELECTRONICS CO., LTD.) 23 July 2008 (2008-07-23) entire document</td> <td>1-10</td> </tr> <tr> <td>A</td> <td>CN 105444494 A (SAMSUNG ELECTRONICS CO., LTD.) 30 March 2016 (2016-03-30) entire document</td> <td>1-10</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	X	CN 108180689 A (SAMSUNG ELECTRONICS CO., LTD.) 19 June 2018 (2018-06-19) description, pages 4-7, and figures 1-9	1-10	A	CN 102455108 A (SAMSUNG ELECTRONICS CO., LTD.) 16 May 2012 (2012-05-16) entire document	1-10	A	CN 101226025 A (SAMSUNG ELECTRONICS CO., LTD.) 23 July 2008 (2008-07-23) entire document	1-10	A	CN 105444494 A (SAMSUNG ELECTRONICS CO., LTD.) 30 March 2016 (2016-03-30) entire document	1-10
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Date of the actual completion of the international search 24 August 2020	Date of mailing of the international search report 07 September 2020														
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/CN) No. 6, Xitucheng Road, Jimenqiao Haidian District, Beijing 100088 China Facsimile No. (86-10)62019451	Authorized officer Telephone No.														

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INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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