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(54) **REFRIGERATOR HAVING ICE MAKING FUNCTION**

(57) A refrigerator having an ice making function, comprising a refrigerator door (1); an inner surface (11) of the refrigerator door (1) is fixedly provided thereon with a mounting support (2), and the mounting support (2) is configured to mount an ice making assembly (3). The mounting support (2) comprises a first surface (21) that faces the refrigerator door (1) and a second surface (22) that is opposite to the first surface (21); the second surface (22) comprises a mounting area (221) used for mounting the ice making assembly (3) as well as an edge area (222) provided at the periphery of the mounting area (221). A wiring groove (211) is formed at the edge area (222) of the mounting support (2), and the wiring groove (211) is recessed in the direction from the first surface (21) toward the second surface (22); and/or the wiring groove (211) is formed at a position corresponding to the edge of the mounting support (2) on the inner surface (11) of the refrigerator door (1), and the wiring groove (211) is recessed in the direction from the inner surface (11) of the refrigerator door (1) toward an outer surface of the refrigerator door (1). Thus, the ice making assembly (3) is disposed closer to the refrigerator door (1), further reducing the space which the ice making assembly (3) occupies as the interior of the refrigerator.

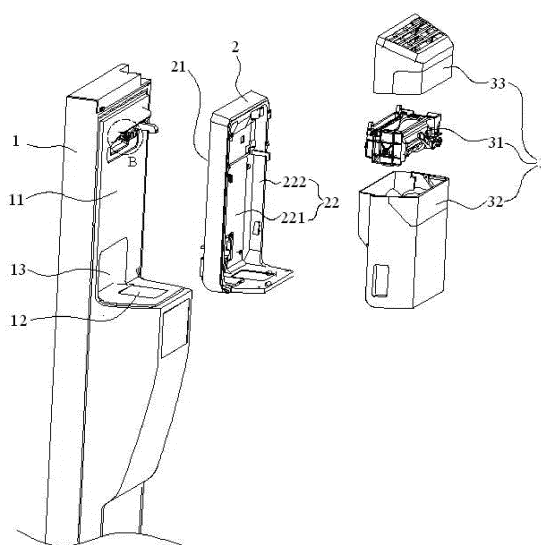


FIG. 2

Description

[0001] This application claims priority to Chinese Patent Application No. 201810061286.2, filed with the Chinese Patent Office on January 22, 2018, titled "REFRIGERATOR HAVING ICE MAKING FUNCTION", which is incorporated herein by reference in its entirety.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of refrigerator technologies, and in particular, to a refrigerator having an ice making function.

BACKGROUND

[0003] With the continuous development of social economy, people's requirements for quality of life are increasing. With the pursuit of quality of life, the functions of household appliances are also increasing. For example, there is an urgent need for a user to have automatic ice making and crushing functions for refrigerator products.

[0004] At present, for most refrigerator products with automatic ice making and breaking functions in the market, components with ice making function or ice breaking function are installed inside the refrigerator. In this way, after the ice making is finished, ice cubes are completely stored in the refrigerator, which wastes space in the refrigerator. In addition, the refrigerator door requires to be opened when ice cubes are taken, which is inconvenient to operate.

SUMMARY

[0005] Some embodiments of the present disclosure provide a refrigerator with an ice making function, and the refrigerator includes a refrigerator door. A mounting bracket is fixedly mounted on an inner surface of the refrigerator door. The mounting bracket is used for mounting an ice making assembly. The mounting bracket includes a first surface facing the refrigerator door and a second surface opposite to the first surface.

[0006] A wiring groove is formed at an edge of the mounting bracket, and the wiring groove is recessed in a direction from the first surface to the second surface, and/or

a wiring groove is formed in an inner surface of the refrigerator door at a position corresponding to an edge of the mounting bracket, and the wiring groove is recessed in a direction from an inner surface of the refrigerator door to an outer surface of the refrigerator door.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] In order to describe technical solutions in embodiments of the present disclosure more clearly, the accompanying drawings to be used in the description of the

embodiments will be introduced briefly below. Obviously, the accompanying drawings to be described below are merely some embodiments of the present disclosure, and a person of ordinary skill in the art can obtain other drawings according to these drawings without paying any creative effort.

FIG. 1 is a schematic diagram showing a structure of a door inner liner of a refrigerator, in accordance with the related art of the present disclosure;

FIG. 2 is an exploded view showing structures of a refrigerator door and an ice making assembly in a refrigerator with an ice making function, in accordance with some embodiments of the present disclosure;

FIG. 3a is a schematic diagram showing a structure of a first surface of a mounting bracket in a refrigerator with an ice making function, in accordance with some embodiments of the present disclosure;

FIG. 3b is a schematic diagram showing a structure of a second surface of a mounting bracket in a refrigerator with an ice making function, in accordance with some embodiments of the present disclosure;

FIG. 4 is a schematic diagram showing a structure of a second surface of a mounting bracket in a refrigerator with an ice making function, in accordance with some embodiments of the present disclosure;

FIG. 5a is a sectional view along line A-A of FIG. 4;

FIG. 5b is a section along the line A-A of FIG. 4;

FIG. 6 is a schematic diagram showing a cross-section structure of a refrigerator with an ice making function, in accordance with some embodiments of the present disclosure; and

FIG. 7 is an enlargement view of portion B of FIG. 2.

DETAILED DESCRIPTION

[0008] Technical solutions in some embodiments of the present disclosure will be described clearly and completely below with reference to the accompanying drawings in some embodiments of the present disclosure. Obviously, the described embodiments are merely some but not all of embodiments. All other embodiments made on the basis of some embodiments of the present disclosure by a person of ordinary skill in the art without paying any creative effort shall be included in the protection scope of the present disclosure.

[0009] In the description of the present disclosure, it will be understood that orientations or positional relationships indicated by terms "center", "upper", "lower",

"front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", "longitudinal", "transverse" etc. are based on orientations or positional relationships shown in the drawings, which merely to facilitate and simplify the description of the present disclosure, but not to indicate or imply that the referred devices or elements must have a particular orientation, or must be constructed or operated in a particular orientation. Therefore, they should not be construed as limitations to the present disclosure.

[0010] In the description of the present disclosure, unless explicitly stated and defined otherwise, it will be noted that the terms "mount", "join", and "connection" should be interpreted broadly, for example, fixed connection, removable connection, or integrated connection. Specific meanings of the above terms in the present disclosure may be understood by a person of ordinary skill in the art according to specific situations.

[0011] Terms "first" and "second" are merely used for a purpose of description and are not to be construed as indicating or implying the relative importance or implicitly indicating the number of referred technical features. Thus, features defined with "first", "second" may explicitly or implicitly include one or more of the features. In the description of the present disclosure, the term "a plurality of" means two or more unless otherwise specified.

[0012] As shown in FIG. 1, in a refrigerator with an ice making function, functional components for making ice and crushing ice are disposed on a door of a freezer compartment. Bosses 02 are disposed on two sides of a door inner liner 01, and a mounting bracket (not shown) for fixing an ice making component and an ice bucket component is fixedly disposed between the two bosses 02. There is a gap reserved between the mounting bracket and the door inner liner 01, and the gap is used as a space for wires of electrical components. The electrical components are essential for the functional components for making ice and crushing ice. However, the functional components for making ice and crushing ice occupies more internal space of the refrigerator due to the reserved gap.

[0013] On this basis, referring to FIG. 2 to FIG. 5, some embodiments of the present disclosure provide another refrigerator with an ice making function. The refrigerator includes a refrigerator door 1. A mounting bracket 2 is fixedly disposed on an inner surface 11 of the refrigerator door 1. The mounting bracket 2 is configured to mount an ice making assembly 3. The mounting bracket 2 includes a first surface 21 facing the refrigerator door 1 and a second surface 22 opposite to the first surface 21. A wiring groove 211 is formed at an edge of the mounting bracket 2, and the wiring groove 211 is recessed in a direction from the first surface 21 to the second surface 22.

[0014] For ease of description, a region of the mounting bracket for mounting the ice making assembly 3 is referred to as a mounting region 221, and the edge of the mounting bracket where the wiring groove is formed is

referred to as an edge region 222. In this way, the second surface 22 includes the mounting region 221 and the edge region 222 that is disposed on at least one side of the periphery of the mounting region 221.

[0015] The wiring groove is formed between a region of the first surface 21 corresponding to the edge region 222 and the inner surface 11 of the refrigerator door 1. For example, in some embodiments of the present disclosure, the first surface 21 is recessed in a direction away from the refrigerator door 1 at a position corresponding to the edge region 222 to form the wiring groove 211, that is, the first surface 21 is recessed at a position corresponding to the edge region 222 toward the second surface 22 to form the wiring groove 211. Or, in some other embodiments of the present disclosure, the inner surface 11 of the refrigerator door is recessed toward the outer surface of the refrigerator door 1 at a position corresponding to the edge region 222 to form the wiring groove. Or, in yet other embodiments of the present disclosure, the first surface 21 is recessed toward the second surface 22 at a position corresponding to the edge region 222, and the inner surface 11 of the refrigerator door is recessed toward the outer surface of the refrigerator door 1 at a position corresponding to the position where the first surface is recessed, and two recesses together form the wiring groove. Since the wiring groove 211 corresponds to a position of the edge region 222 where the ice making assembly 3 is not mounted, there is no need to reserve a space for wires between a portion of the first surface 21 corresponding to the mounting region 221 and the inner surface 11 of the refrigerator door 1. In this way, the ice making assembly 3 is mounted close to the refrigerator door 1, thereby reducing an internal space of the refrigerator occupied by the ice making assembly 3.

[0016] Since there is no need to reserve the space for wires between the portion of the first surface 21 corresponding to the mounting region 221 and the inner surface 11 of the refrigerator door 1, at least a portion of the first surface 21 corresponding to the mounting region 221 is in close contact with the inner surface 11 of the refrigerator door 1, thereby making the ice making assembly 3 be mounted closer to the refrigerator door 1, which further reduces the internal space of the refrigerator occupied by the ice making assembly 3.

[0017] As shown in FIG. 5b, in some embodiments of the present disclosure, the mounting bracket 2 includes a substantially flat main body portion 213 in the mounting region 221. The mounting bracket 2 includes, in the edge region 222, a bent portion 214 disposed on at least one side of the main body portion 213, and a baffle plate 223 connected to the bent portion 214. After the mounting bracket 2 is mounted on the refrigerator door 1, an included angle between the baffle plate 223 and the inner surface of the refrigerator door 1 is greater than 60°.

[0018] In some embodiments of the present disclosure, a first end of the bent portion 214 is connected to the main body portion 213, and the bent portion 214 is

bent in a direction away from the refrigerator door 1 relative to a plane where the main body portion 213 is located. A second end of the bent portion 214 distal to the main body portion 213 is connected to the baffle plate 223, the wiring groove 211 is formed between the bent portion 214 and the baffle plate 223, and an opening of the wiring groove 211 faces the inner surface 11 of the refrigerator door 1.

[0019] In some embodiments of the present disclosure, as shown in FIG. 5b, the bent portion 214 includes a turn 215, a longitudinal extension portion 216, and a transverse extension portion 217. One end of the turn 215 is connected to at least one side of the main body portion 213 to make a transition between the main body portion 213 and the longitudinal extension portion 216. In some embodiments of the present disclosure, the turn 215 is curved. In some other embodiments of the present disclosure, the turn 215 is planar. The turn 215 facilitates the forming of an overall structure of the mounting bracket and improves the production efficiency. For example, in a machining production mode, the machining difficulty may be reduced, and the yield and the production efficiency may be improved. In an injection molding production mode, it helps with demoulding to improve the yield and the production efficiency.

[0020] In some embodiments of the present disclosure, the longitudinal extension portion 216 is planar. A first end of the longitudinal extension portion 216 is connected to the turn 215, and a second end of the longitudinal extension portion 216 is inclined toward the baffle plate relative to a direction perpendicular to a normal of the main body portion. This design also facilitates machining or help with demolding in injection molding.

[0021] In some embodiments of the present disclosure, a first end of the transverse extension portion 217 is connected to the second end of the longitudinal extension portion 216, and a second end of the transverse extension portion 217 is connected to an end of the baffle plate 223 distal to the inner surface 11 of the refrigerator door 1.

[0022] The turn 215, the longitudinal extension portion 216, the transverse extension portion 217 and the baffle plate 223 together form the wiring groove 211 whose opening is toward the inner surface 11.

[0023] In some embodiments of the present disclosure, the edge of the mounting bracket 2 include an upper edge located above the mounting region, a left edge located on a left side of the mounting region, and a right edge located on a right side of the mounting region. For ease of description, as shown in FIG. 3 and FIG. 4, the upper edge is described as an upper edge region 222a, the left edge is described as a left edge region 222b, and the right edge is described as a right edge region 222c.

[0024] There are a number of options for positions of the wiring groove 211. In some embodiments of the present disclosure, an upper wiring groove 211a is formed at a portion corresponding to the upper edge region 222a. In some embodiments of the present disclo-

sure, a left wiring groove 211b is formed at a portion corresponding to the left edge region 222b. In some embodiments of the present disclosure, a right wiring groove 211c is formed at a portion corresponding to the right edge region 222c. As shown in FIG. 3, in some embodiments of the present disclosure, all of the upper wiring groove 211a, the left wiring groove 211b and the right wiring groove 211c are formed, and both ends of the upper wiring groove 211a are respectively communicated with the left wiring groove 211b and the right wiring groove 211c. In this way, when wires are routed, the wires are routed via all of the three wiring grooves 211a, 211b, and 211c. In some embodiments of the present disclosure, electrical components proximate to the left edge region 222b are routed via the left wiring groove 211b, electrical components proximate to the right edge region 222c are routed via the right wiring groove 211c, and electrical components proximate to the upper edge region 222a are routed via the upper wiring groove 211a. In this way, the space for routing wires is large and choices for routing wires are various.

[0025] There are various arrangements for the wiring groove 211. As shown in FIG. 3 and FIG. 5a, in some embodiments of the present disclosure, the first surface 21 is recessed in a direction away from the refrigerator door 1 at the position corresponding to the edge region 222 to form the wiring groove 211. In order to increase a depth of the wiring groove 211, the edge region 222 extends in a direction away from the refrigerator door 1 to form a projecting edge 24. In this way, not only the depth of the wiring groove 211 is increased, but also the ice making assembly 3 is limited in a left-right direction by the projecting edge 24, which makes the installation of the ice making assembly 3 more stable.

[0026] In some embodiments of the present disclosure, the maximum distance between the baffle plate 223 in the edge region 222 and the inner surface 11 of the refrigerator door 1 is greater than a distance between the first surface 21 and the inner surface 11, so that after the first surface 21 is in close contact with the inner surface 11 of the refrigerator door 1, there is still a distance between the baffle plate 223 and the inner surface 11 of the refrigerator door 1. Therefore, even if there is a baffle plate 223, the first surface 21 is not prevented from closely contacting the inner surface 11 of the refrigerator door 1. An end of the baffle plate 223 distal to the inner surface 11 of the refrigerator door 1 extends toward a side away from the inner surface 11 relative to the first surface 21 and is connected to the bent portion 214, thereby enhancing a position limit of the second surface 22 to the ice making assembly disposed on the second surface 22.

[0027] In some embodiments of the present disclosure, the wiring groove is formed in the inner surface 11 of the refrigerator door 1. That is, the inner surface 11 of the refrigerator door 1 is recessed toward the outer surface of the refrigerator door 1 at a position corresponding to the edge region 222 to form the wiring groove.

[0028] In some embodiments of the present disclo-

sure, the first surface 21 of the mounting bracket 2 is recessed in a direction away from the refrigerator door 1 at a position corresponding to the edge region 222 to form the wiring groove 211, and the inner surface 11 of the refrigerator door 1 is recessed toward the outer surface of the refrigerator door 1 at a position corresponding to the wiring groove 211 to form a wiring groove. The wiring groove 211 in the first surface 21 of the mounting bracket 2 is aligned with the wiring groove in the inner surface of the refrigerator door 1 to form a wiring groove with a larger volume, which increases the volume of the wiring groove, and this is suitable for a scene with more cables.

[0029] In order to connect wires of the ice making assembly 3 to a main board of the refrigerator, the wires of the ice making assembly 3 are connected to the main board of the cabinet through a wire connector on the refrigerator door 1 after passing through the wiring groove 211. In some embodiments of the present disclosure, as shown in FIG. 2 and FIG. 7, a wire connector 4 is disposed on the inner surface 11 of the refrigerator door 1 at a position corresponding to the upper wiring groove 211a. The wire connector 4 is configured to connect to wires in the wiring groove 211a and connect to wires in the refrigerator door 1 through a hinge hole of an upper hinge of the refrigerator door 1, so that the wires in the wiring groove 211a are connected to the main board in the refrigerator. In some embodiments of the present disclosure, the wire connector 4 is located at a corner of the inner surface 11 of the refrigerator door 1 corresponding to a position of the upper wiring groove 211a.

[0030] As shown in FIG. 2, in some embodiments of the present disclosure, in a case where the wiring groove 211 is formed only in the first surface 21 of the mounting bracket 2, except for a position on the inner surface 11 of the refrigerator door 1 where the wire connector 4 is disposed, positions on the inner surface of refrigerator door 1 corresponding to the mounting region 221 and the edge region 222 are located on a same plane. That is, there is no limiting boss or groove structure at a position on the inner surface 11 of the refrigerator door 1 corresponding to the mounting region. In this way, the mounting bracket is made to extend to the surrounding area, thereby increasing the size and effective volume of the ice making assembly 3.

[0031] In some embodiments of the present disclosure, the mounting bracket 2 is connected to the inner surface 11 of the refrigerator door 1 through threads or fastener(s).

[0032] In order to improve the reliability of products, as shown in FIG. 3, a plurality of cable clips 212 are provided in the wiring groove 211, and wires in the wiring groove 211 are fastened and fixed through the cable clips 212.

[0033] In some embodiments of the present disclosure, the ice making assembly 3 includes an ice crusher. In some embodiments of the present disclosure, an ice crushing motor of the ice crusher is fixed on the inner surface 11 of the refrigerator door 1. In some embodi-

ments of the present disclosure, the ice crushing motor of the ice crusher is fixed on the mounting bracket 2. As shown in FIG. 3, a motor mounting box 23 is disposed on the first surface 21 of the mounting bracket, and the ice crushing motor is fixed in the motor mounting box 23. Since the motor mounting box 23 extends toward the refrigerator door relative to the first surface 21, in a case where the ice crushing motor is installed, operation is easier and positioning is more accurate. In some embodiments of the present disclosure, the motor mounting box 23 extends toward the cabinet of the refrigerator, that is, the motor mounting box 23 protrudes toward the compartment of the refrigerator. In this way, a foaming layer of the door is not made to be reduced, so that a heat preservation effect of the refrigerator is not reduced. In some embodiments of the present disclosure, as shown in FIG. 2, a cavity 13 is formed at a position of the refrigerator door 1 corresponding to the motor mounting box 23, and the motor mounting box 23 extends into the cavity 13. This saves storage space of the cabinet.

[0034] In some embodiments of the present disclosure, as shown in FIGS. 2 and 6, the ice making assembly 3 includes an ice maker 31 and an ice storage bucket 32 disposed below the ice maker 31. An ice outlet is provided on the bottom of the ice storage bucket 32. An ice outlet passage 12 extending through the refrigerator door 1 is provided in the refrigerator door 1. One end of the ice outlet passage 12 is communicated with the ice outlet of the ice storage bucket 32, and another end of the ice outlet passage 12 extends out of the refrigerator door 1, that is, extends out of the outer surface of the refrigerator door 1. Therefore, the ice is taken directly without opening the refrigerator door 1, which makes operation of taking ice convenient.

[0035] In some embodiments of the present disclosure, as shown in FIG. 2, an ice making cover 33 is further disposed above the ice maker 31 to prevent foreign objects from falling into the ice maker.

[0036] The foregoing descriptions are merely some specific implementation manners of the present disclosure, but the protection scope of the present disclosure is not limited thereto, and the changes or replacements that any person skilled in the art can easily think of in the technical scope disclosed by the present disclosure should be within the protection scope of the present disclosure. Therefore, the protection scope of the present disclosure shall be subject to the protection scope of the claims.

Claims

1. A refrigerator with an ice making function, the refrigerator comprising a refrigerator door, a mounting bracket being fixedly disposed on an inner surface of the refrigerator door, the mounting bracket being configured to mount an ice making assembly, and the mounting bracket including a first surface facing

- the refrigerator door, and a second surface opposite to the first surface;
 a wiring groove being formed on an edge of the mounting bracket, and the wiring groove being recessed in a direction from the first surface to the second surface, and/or,
 a wiring groove being formed in the inner surface of the refrigerator door at a position corresponding to the edge of the mounting bracket, and the wiring groove being recessed in a direction from the inner surface of the refrigerator door to an outer surface of the refrigerator door.
2. The refrigerator with the ice making function according to claim 1, wherein a region on the second surface configured to mount the ice making assembly is a mounting region, and a region on the second surface configured to forming the wiring groove is an edge region, and the edge region is disposed on at least one side of a periphery of the mounting region; and
 at least a portion of the first surface corresponding to the mounting region is in close contact with the inner surface of the refrigerator door.
 3. The refrigerator with the ice making function according to claim 1 or 2, wherein the edge of the mounting region includes an upper edge located on an upper portion of the mounting bracket, a left edge located on a left side of the mounting bracket, and a right edge located on a right side of the mounting bracket; the wiring groove includes one or more of an upper wiring groove corresponding to the upper edge, a left wiring groove corresponding to the left edge and a right wiring groove corresponding to the right edge.
 4. The refrigerator with the ice making function according to claim 3, wherein the wiring groove includes the upper wiring groove, the left wiring groove, and the right wiring groove; two ends of the upper wiring groove are respectively communicated with the left wiring groove and the right wiring groove.
 5. The refrigerator with the ice making function according to any one of claims 1-4, wherein the mounting bracket is connected to the inner surface of the refrigerator door through threads or fasteners.
 6. The refrigerator with the ice making function according to claim 3, wherein the edge of the mounting bracket extends in a direction away from the refrigerator door to form a projecting edge.
 7. The refrigerator with the ice making function according to any one of claims 1-4, wherein a motor mounting box is disposed on the first surface of the mounting bracket, and an ice crushing motor of the ice making assembly is fixed in the motor mounting box.
 8. The refrigerator with the ice making function according to claim 7, wherein
 in a case where the mounting bracket is installed on the refrigerator door, the motor mounting box extends toward a cabinet of the refrigerator; or,
 a cavity is formed at a position of the refrigerator door corresponding to the motor mounting box, and the motor mounting box extends into the cavity.
 9. The refrigerator with the ice making function according to claim 3, wherein the wiring groove is formed only on the first surface of the mounting bracket, and the wiring groove includes the upper wiring groove, and
 a wire connector is disposed at a position corresponding to the upper wiring groove on the inner surface of the refrigerator door, the wire connector is configured to connect wires in the upper wiring groove and connect to wires in the refrigerator door through a hinge hole of an upper hinge of the refrigerator door.
 10. The refrigerator with the ice making function according to claim 9, wherein the wire connector is disposed at a corner of the inner surface of the refrigerator door corresponding to a position of the upper wiring groove.
 11. The refrigerator with the ice making function according to any one of claims 1-4, wherein a plurality of cable clips are distributed in the wiring groove, and the cable clips are configured to fix cables in the wiring groove.
 12. The refrigerator with the ice making function according to any one of claims 1-4, wherein the ice making assembly includes an ice maker and an ice storage bucket disposed below the ice maker, an ice outlet is disposed on a bottom of the ice storage bucket, an ice outlet passage extending through the refrigerator door is disposed in the refrigerator door, an end of the ice outlet passage is communicated with the ice outlet of the ice storage bucket, and another end of the ice outlet passage extends out of the refrigerator door.
 13. The refrigerator with the ice making function according to any one of claims 1-4, wherein an ice making cover is further disposed above the ice maker.

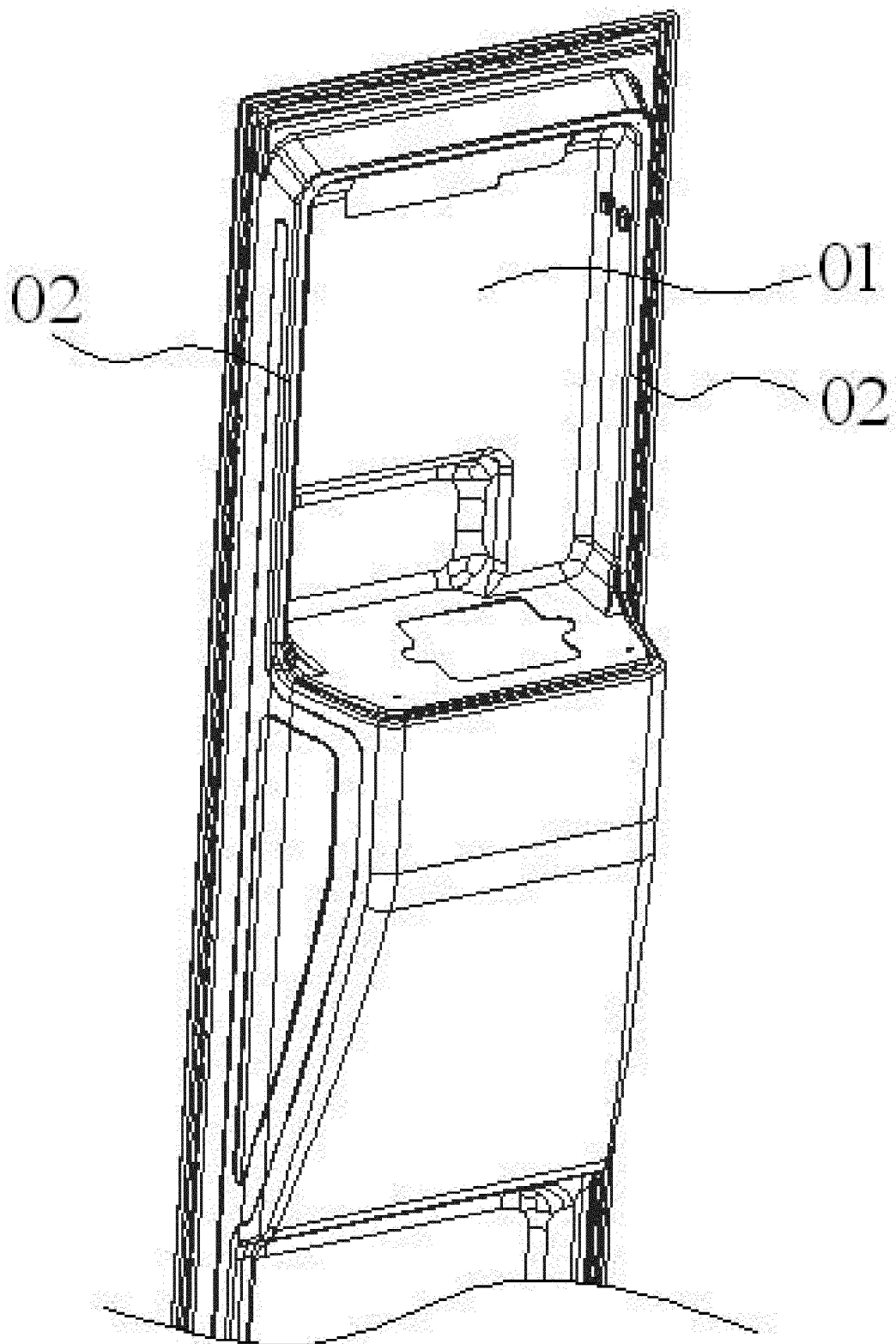


FIG. 1

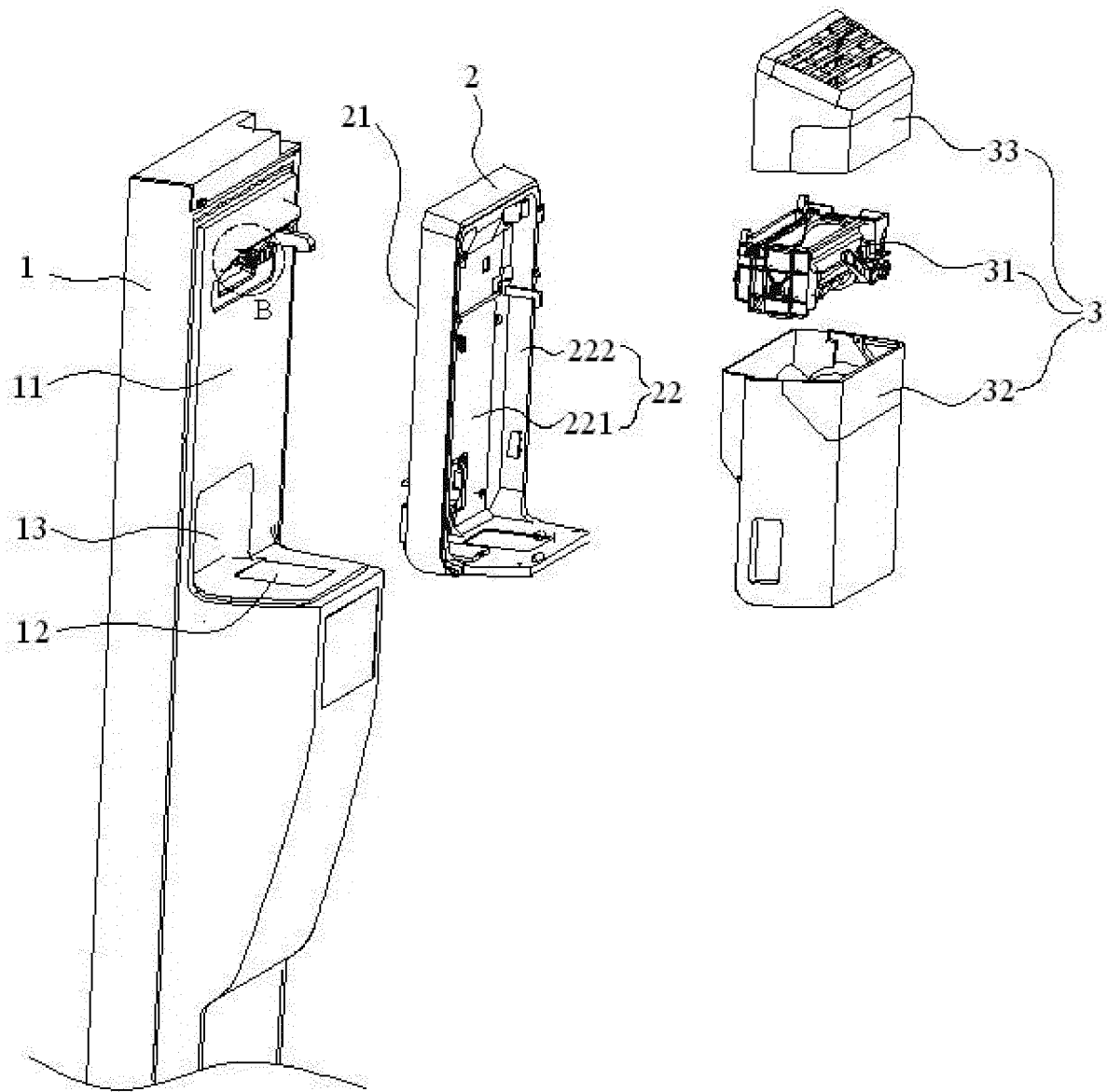


FIG. 2

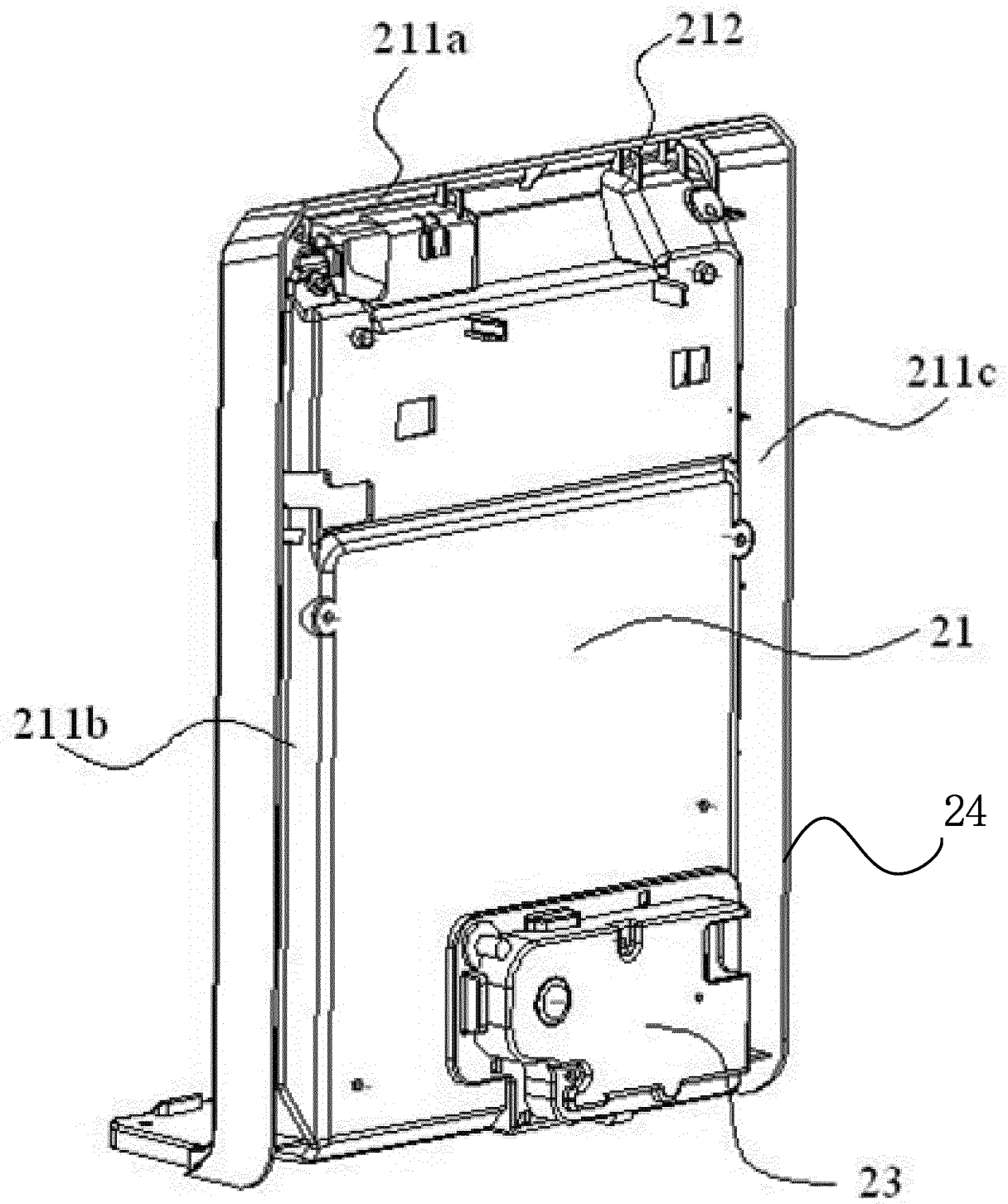


FIG. 3a

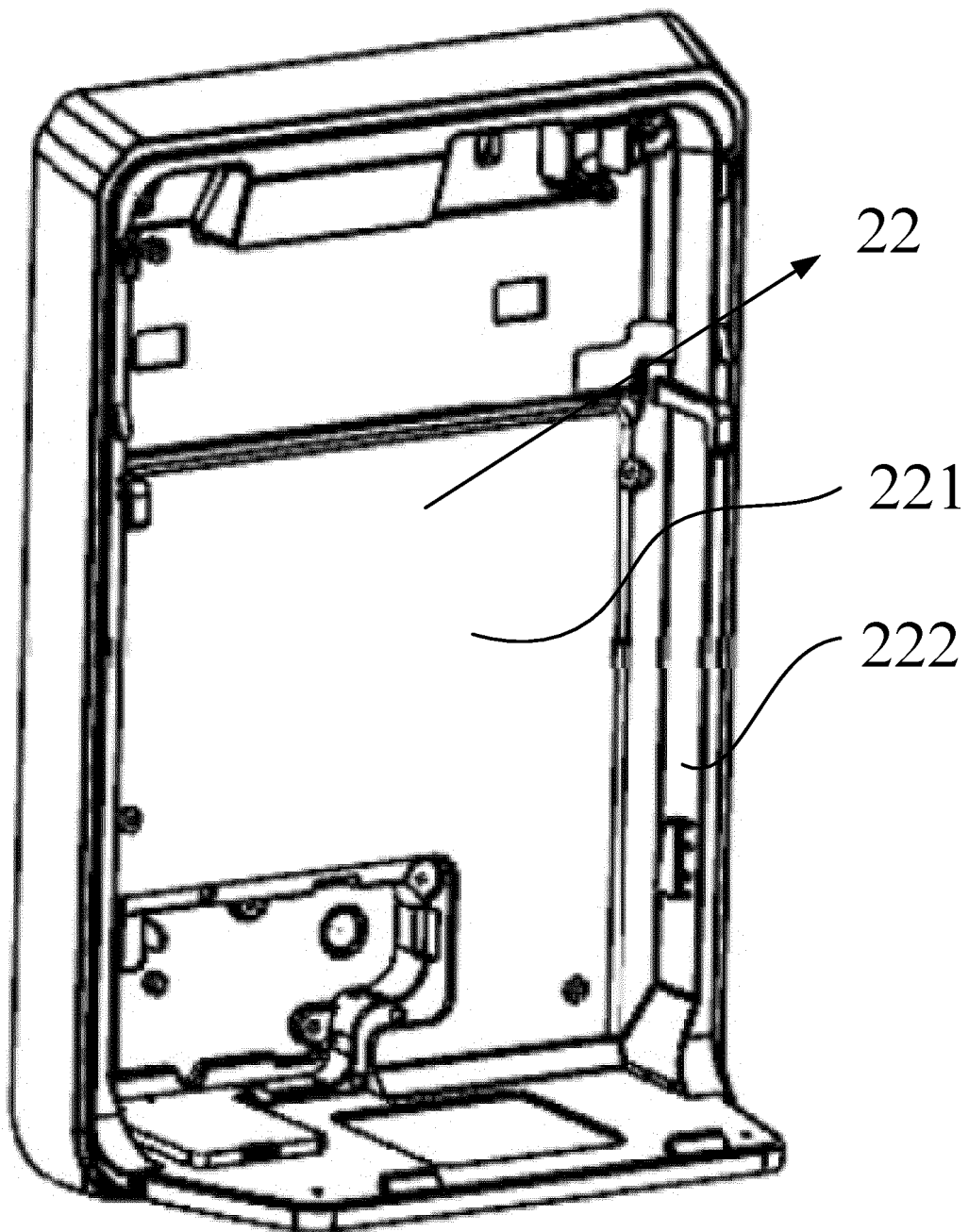


FIG. 3b

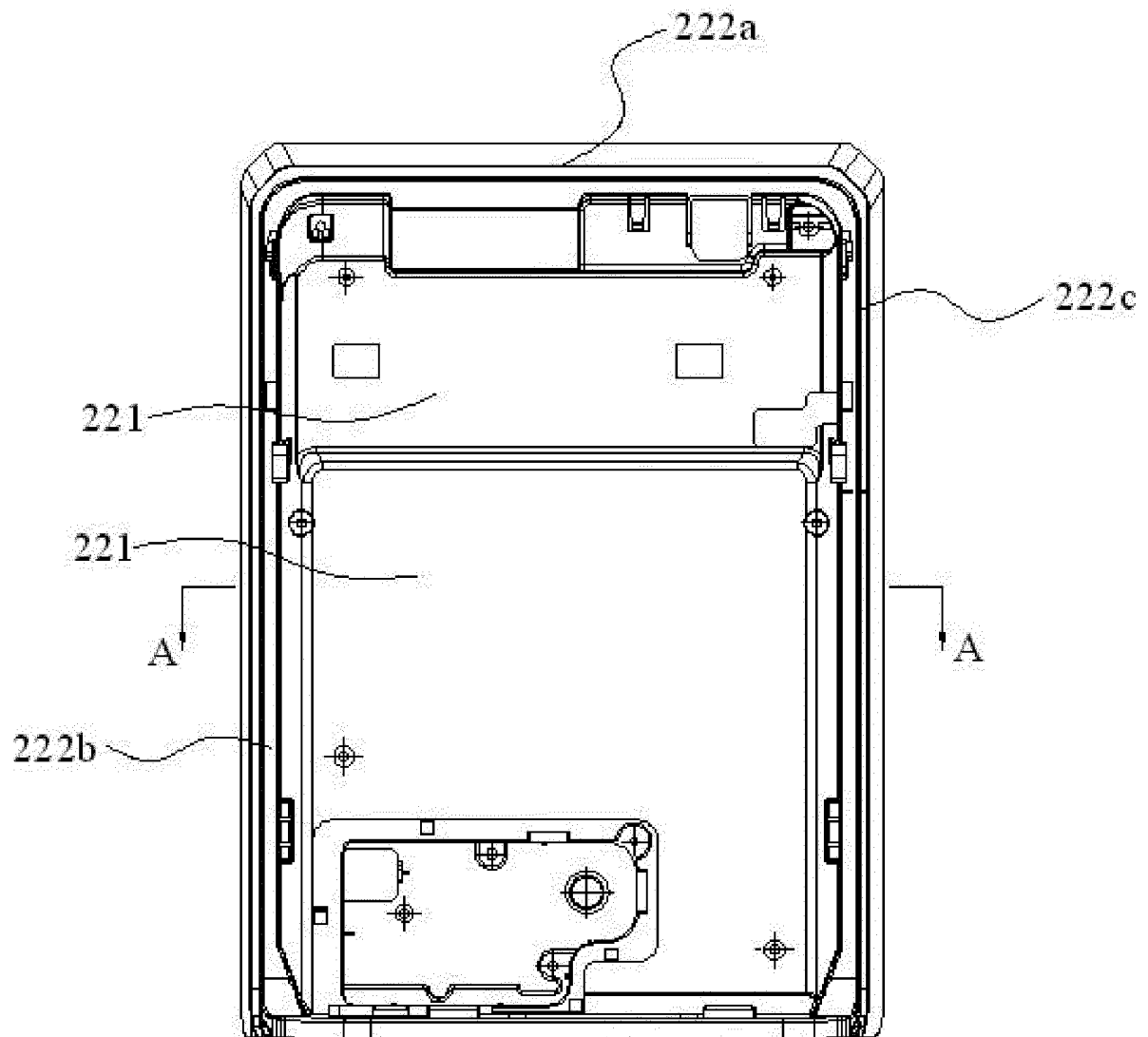


FIG. 4

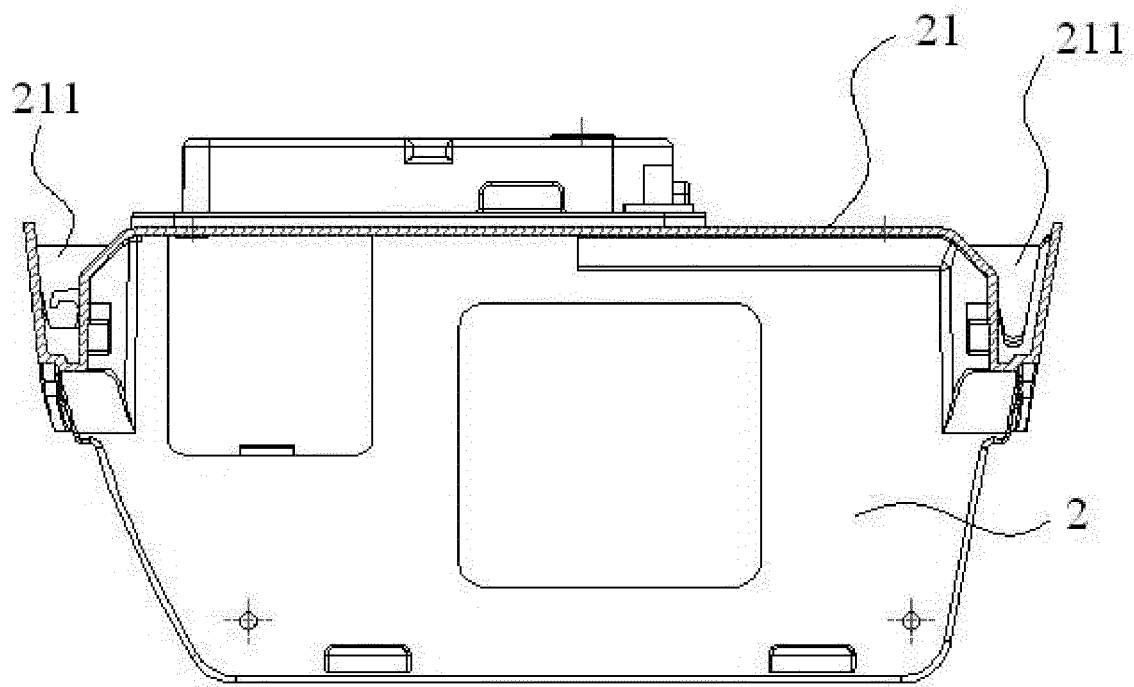


FIG. 5a

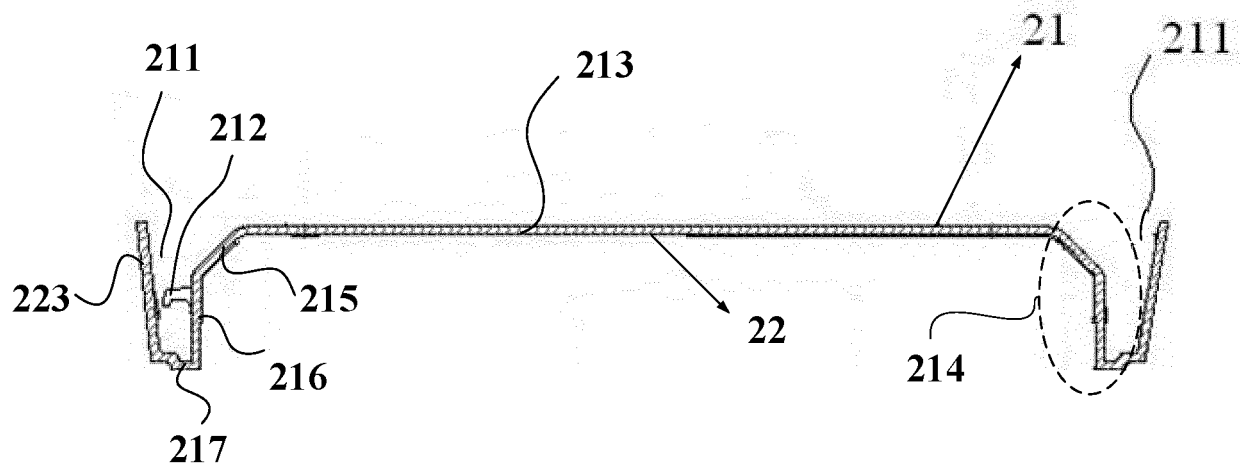


FIG. 5b

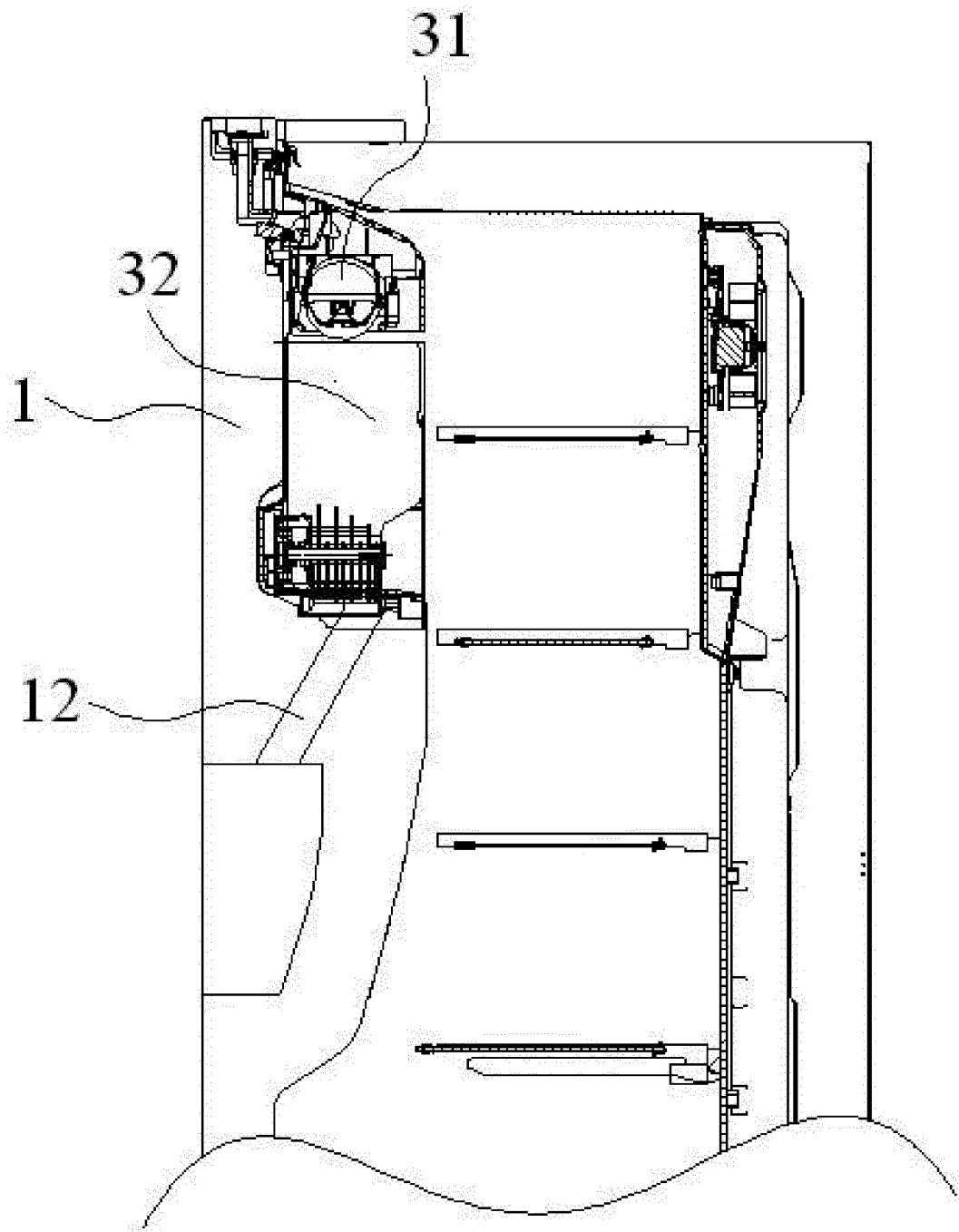


FIG. 6

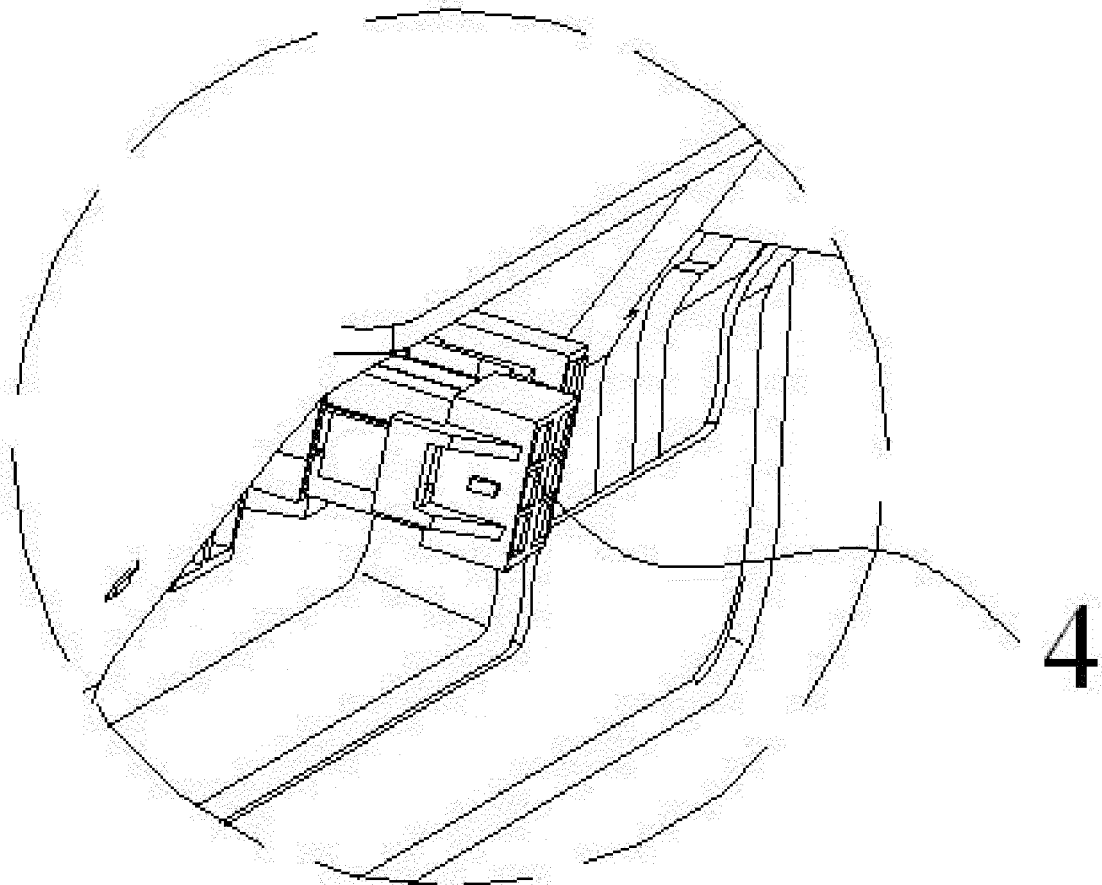


FIG. 7

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/101553

A. CLASSIFICATION OF SUBJECT MATTER F25D 23/12(2006.01)i; F25C 1/00(2006.01)i According to International Patent Classification (IPC) or to both national classification and IPC																		
B. FIELDS SEARCHED Minimum documentation searched (classification system followed by classification symbols) F25D; F25C 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) WPI, EPODOC, CNABS, CNKI: 冰箱, 制冰, 电线, 走线, 布线, 线槽, 槽, wire, wiring, trunking, slot?, groove?																		
C. DOCUMENTS CONSIDERED TO BE RELEVANT																		
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International application No.

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