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(54) **REFRIGERATOR**

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RÉFRIGÉRATEUR

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Description

[0001] The present disclosure relates to a refrigerator including a hinge insertion-type door in which a hinge is inserted into a door.

2. Background

[0002] In general, a refrigerator is a device for keeping food frozen/refrigerated, including a refrigerator body having a freezing chamber and a refrigerating chamber and a door provided to open and close the freezing chamber and the refrigerating chamber.

[0003] A refrigerator may be classified as a top mount type, a bottom freezer type, and a side-by-side type depending on a position of a refrigerating chamber and a freezing chamber. The top mount type refrigerator includes a freezing chamber in an upper part thereof and a refrigerating chamber in a lower part thereof. The bottom freezer type refrigerator has a refrigerating chamber in an upper part thereof and a freezing chamber in a lower part thereof. The side-by-side type refrigerator includes a refrigerating chamber and a freezing chamber which are disposed horizontally.

[0004] In a general refrigerator, generally, a door is separately provided in each of a refrigerating chamber and a freezing chamber. However, in case of a small refrigerator, a one-door type refrigerator in which a storage chamber for keeping food in storage is provided within a main body and one door is provided to open and close the storage chamber has also been released.

[0005] FIG. 1 is a partially enlarged perspective view illustrating a configuration in which a hinge 13 is installed in an upper part of a related art one-door type refrigerator 10.

[0006] One side of the hinge 13 is disposed in a corner portion of a right upper end of a refrigerator body 11 and the other side thereof is disposed in an upper end portion of an upper right side of the door 12 to connect the right upper end of the door 12 and the right upper end of the refrigerator body 11. Here, a hinge shaft 14 is disposed in a vertical direction in a front end portion of the hinge 13, an upper end portion of the hinge shaft 14 is rotatably installed in the front end portion of the hinge 13, and the other remaining portion of the hinge shaft 14, excluding the upper end portion thereof, is insertedly coupled to an interior of an upper side of the door 12.

[0007] The door 12 rotates in a forward/backward direction with respect to the refrigerator body 11, centered on the hinge shaft 14 to open and close a food storage chamber provided within the refrigerator body 11.

[0008] However, the one-door type refrigerator 10 is applied to a small refrigerator having a height lower than a height of the general grown-ups, and the hinge 13 installed at the upper end of the refrigerator body 11 is exposed outwards, lacking elegance in appearance.

[0009] Thus, a hinge insertion-type door in which exposure of the hinge 13 to outside is minimized has been developed. In this disclosure, a hinge insertion-type door refers to a door in which a portion of a hinge is inserted into an interior of one side of the door.

[0010] FIG. 2 is a conceptual view illustrating a configuration in which a related art door hinge 23 is viewed from above in a related art small refrigerator 20 to which a hinge insertion-type door 22 is applied.

[0011] As illustrated in FIG. 2, in order to minimize exposure of the hinge 23 to the outside, a hinge accommodation part 25 in which a front end portion of the hinge 23 and a hinge shaft 24 are accommodated may be provided on an upper inner side of the door 22. However, the related art hinge 22 protrudes linearly toward a front side from the refrigerator body 21 and an outer end portion of the door 22 is interfered with by the hinge 23, making it impossible to open the door 22 at an opening angle required in a refrigerator, for example, at an angle of 120 degrees or greater. Also, small refrigerators have a small storage chamber, relative to large refrigerators, and doors thereof tend to be reduced in thickness.

[0012] FIG. 3 is a conceptual view, viewed from above, illustrating a configuration in which a space between a hinge shaft 34 and a refrigerator body 31 is shortened when a thickness of a door 32 of a small refrigerator employing a related art hinge 33 is reduced.

[0013] As illustrated in FIG. 3, when the thickness of the door 32 is reduced, a space d2 between the hinge shaft 34 and the refrigerator body 31 is reduced to be smaller than a space d1 between the hinge shaft 24 and the refrigerator body 21 illustrated in FIG. 2.

[0014] However, in the related art hinge 33, since the space between the hinge shaft 34 and the refrigerator body 31 is fixed, the related art hinge 33 cannot be used unless a length of the hinge 33 is reduced.

[0015] In addition, since the related art hinge 33 cannot satisfy opening and closing performance of the door 32, that is, a required maximum opening angle of the door 32, when the space between the hinge shaft 34 and the main body 31 is reduced.

[0016] JP2007132533A discloses a refrigerating compartment door 4 comprising a hinge 5 composed of a hinge body 6 and a hinge pin 7. The door 4 also has a frame body 8 made of resin and formed at the upper portion of the refrigerating compartment door 4. The door 4 has a receiving portion 10 with an opening 9 to receive the hinge 5.

[0017] JP2009103395A discloses a door hinge 14 having a fixing portion. The fixing portion has a protruding part 14a that extends from the fixing portion and has an opening fitting with a bearing. The door hinge 14 rotatably connects a heating insulation box and a door via the bearing and a shaft. An L-shaped flange 14c of the hinge 14 is erected in a rim of the protruding part 14a.

[0018] WO2008/075810A1 discloses a door supporting device for a refrigerator. The door supporting device includes a main body formed with a predetermined storage space therein and a door for selectively opening or closing the storage space. The door supporting device

has a hinge plate extending from one side of a front surface of the main body and having a downwardly extending hinge pin, and an installing recess formed by inwardly depressing a portion of an upper surface of the door a predetermined depth.

[0019] WO2009/043696A1 discloses an electrical domestic appliance comprising a body having an internal holding space and at least one door with which said holding space is closed. The appliance also comprises a hinge that hinges the door to the body, the hinge having a first end fastening to the body and a second end that can be swivelled relative to the door. A first recess is provided on the top of the body, the first end being received and fastened in said first recess. A second recess is provided on the top of the door, the second end being received and fastened in said second recess.

SUMMARY

[0020] The present invention is disclosed in the independent claim 1. Further embodiments are disclosed in the dependent claims.

[0021] According to the present invention, a refrigerator includes: a refrigerator body having a storage chamber for keeping food therein; a door rotatably installed in the refrigerator body and opening and closing the storage chamber; a hinge connecting an upper side of the door and an upper side of the refrigerator body such that the door is rotatable forwardly and backwardly with respect to the refrigerator body; and a hinge accommodation part provided on an upper side of the door and accommodating a portion of the hinge, wherein the hinge includes: a body part installed in the refrigerator body; a hook part protruding from the body part and bent toward an outer end portion of the hinge accommodation part in a state in which an end portion thereof is accommodated in the hinge accommodation part; and a hinge shaft provided at an end portion of the hook part and rotatably installed within the door.

[0022] According to an example of the present disclosure, a curved portion may be formed to be rounded at an outer end portion of the door, and an outer end portion of the hinge accommodation part may form a portion of the curved portion.

[0023] According to an example of the present disclosure, a portion of the hook part may be bent to have a curvature corresponding to a curvature of the curved portion.

[0024] According to an example of the present disclosure, the hook part and the body part may be coplanar.

[0025] According to an example of the present disclosure, one side of the hook part may be disposed to face an inner end portion of the hinge accommodation part and aligned with one side of the body part, and the other side of the hook part may be concave with a preset curvature and at least a portion of the other side of the hook part may be disposed to face an outer end portion of the hinge accommodation part when the door is opened at a maximum angle.

[0026] According to an example of the present disclosure, a protrusion portion may protrude upwardly from an upper surface of the hook part and have a shape corresponding to the hook part.

[0027] According to an example of the present disclosure, at least a portion of the protrusion portion may be disposed to overlap an upper surface of the refrigerator body in a vertical direction.

[0028] According to the present invention, the refrigerator further includes a hinge installation part provided on a lower surface of the hinge accommodation part, wherein the hinge installation part may have a ring portion covering an outer circumferential surface of a hinge shaft and having an insertion hole for inserting the hinge shaft therein.

[0029] According to the present invention, the hinge installation part includes:
a through hole formed on an inner side in a penetrating manner in a vertical direction; a plurality of reinforcing portions provided in the through hole and externally engaged with the ring portion; and a plurality of reinforcing ribs connecting the plurality of reinforcing portions and the hinge installation part.

[0030] According to the present invention, the hinge installation part is provided separately from the hinge accommodation part, and detachably coupled to a lower surface of the hinge accommodation part.

[0031] According to an example of the present disclosure, the refrigerator may further include: an upper cap detachably installed on an upper side of the door, wherein the hinge accommodation part may be provided within one side of the upper cap.

[0032] According to an example of the present disclosure, the refrigerator may further include: a hinge cover detachably installed at an upper front end portion of the refrigerator body such that at least a portion thereof covers the body part.

[0033] According to the present disclosure configured described, the following advantages may be obtained.

[0034] First, since a structure of the hinge has a hook shape, even though the hinge is inserted into an upper side of the door, the door may be rotated at a required maximum opening angle without being interfered with the hinge.

[0035] Second, since the hook-shaped hinge structure is applied to the door hinge, a hinge insertion-type door in which a hinge is inserted to a door may be applied to a one-door type small refrigerator having a height lower than a height of the grown ups.

[0036] Third, since the hinge is inserted into the door and covered therein in a small refrigerator having a height lower than a height of the grown-ups, appearance of the refrigerator is fine.

[0037] Fourth, since the hinge structure has a hook shape, even tough a thickness of the door is reduced so a space between the hinge shaft and the refrigerator body is reduced, existing door opening and closing perform-

ance may be maintained.

[0038] Fifth, since the hinge structure has a hook shape, an outer end portion of the door may be rounded to obtain a classy appearance of the refrigerator.

[0039] Further scope of applicability of the present application will become more apparent from the detailed description given hereinafter. However, it should be understood that the detailed description and specific examples, while indicating preferred embodiments, are given by way of illustration only, since various changes and modifications within the scope of the appended claims will become apparent to those skilled in the art from the detailed description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0040] The accompanying drawings, which are included to provide a further understanding and are incorporated in and constitute a part of this specification, illustrate exemplary embodiments and together with the description serve to explain the principles of the disclosure.

[0041] In the drawings:

FIG. 1 is a partially enlarged perspective view illustrating a configuration in which a hinge is installed in an upper portion of the prior art one-door type refrigerator.

FIG. 2 is a conceptual view illustrating a configuration in which the prior art door hinge is viewed from above when a hinge insertion-type door is applied to a related art small refrigerator.

FIG. 3 is a conceptual view, viewed from above, illustrating a configuration in which a space between a hinge shaft and a main body is reduced when a thickness of a door is reduced in a small refrigerator employing a prior art hinge structure.

FIG. 4 is a perspective view of a refrigerator according to an embodiment of the present disclosure.

FIG. 5 is a front view of the refrigerator of FIG. 4.

FIG. 6 is an enlarged view illustrating a configuration in which an upper portion of a door 120 is installed to be rotatable by a hinge 130 in an upper portion of the refrigerator body in FIG. 4.

FIG. 7 is a plan view of a hinge illustrating a hinge structure of FIG. 6.

FIG. 8 is a side view of the hinge viewed in a leftward direction in FIG. 7.

FIG. 9 is a conceptual view illustrating a configuration in which a portion of a hinge is inserted into a hinge accommodation part when a door is closed according to an embodiment of the present disclosure.

FIG. 10 is a conceptual view, viewed from above, illustrating a configuration in which a hinge is coupled to a ring portion provided on an inner side of a hinge accommodation part in FIG. 9.

FIG. 11 is a conceptual view, viewed from above, illustrating a configuration in which an outer end portion of a hinge accommodation part is disposed to face a portion of an inner surface of a hook part when a door is opened according to an embodiment of the present disclosure.

FIG. 12 is a conceptual view, viewed from above, illustrating a configuration in which a hinge is coupled to a ring portion provided on an inner side of a hinge accommodation part in FIG. 11.

FIG. 13 is a conceptual view illustrating an upper cap provided separately from a door according to an example.

FIG. 14 is an enlarged conceptual view of a hinge accommodation part of FIG. 13.

DETAILED DESCRIPTION OF THE INVENTION

[0042] Hereinafter, a refrigerator according to an embodiment of the present disclosure will be described in detail with reference to the accompanying drawings, in which like numbers refer to like elements throughout although the embodiments are different. As used herein, the singular forms "a", "an" and "the" are intended to include the plural forms as well, unless the context clearly indicates otherwise.

[0043] FIG. 4 is a perspective view of a refrigerator 100 according to an embodiment of the present disclosure, FIG. 5 is a front view of the refrigerator 100 of FIG. 4, FIG. 6 is an enlarged view illustrating a configuration in which an upper portion of a door 120 is installed to be rotatable by a hinge 130 in an upper portion of the refrigerator body in FIG. 4, FIG. 7 is a plan view of the hinge 130 illustrating a hinge structure of FIG. 6, and FIG. 8 is a side view of the hinge 130 viewed in a leftward direction in FIG. 7.

[0044] The refrigerator 100 illustrated in FIG. 4 is a one-door type refrigerator 100 including one piece of door 120.

[0045] The refrigerator 100 includes a refrigerator body 110 and the door 120.

[0046] A storage chamber is provided within the refrigerator body 110, and food may be kept to be refrigerated at a preset temperature within the storage chamber.

[0047] A shelf 112 is coupled to be slidable in a forward/backward direction to keep food, or the like, in storage and a vegetable chamber 113 separately keeping vegetable or fruit refrigerated are provided within the refrigerator body 110.

[0048] A refrigerating cycle device is provided in the refrigerator body 110 to produce cold air. The refrigerating cycle device may include a compressor, a condenser, a capillary (or an expansion valve), and an evaporator. A refrigerant is heat-exchanged with air of a storage chamber through the evaporator, while circulating the compressor, the condenser, the expansion valve, and the evaporator connected by a refrigerant pipe.

[0049] A blow fan applies power to cold air to circulate cold air within the storage chamber.

[0050] The door 120 is rotatably installed in front of the refrigerator body 110 to open and close the storage

chamber.

[0051] In order to prevent a user's finger from being caught in the door when the door is opened or closed, a uniform safety distance may be secured between the refrigerator body 110 and the door 120.

[0052] For example, an appropriate safety distance between the door 120 and the refrigerator body 110 may be about 10 nm. However, the present disclosure is not limited thereto.

[0053] A sealing member formed of a material such as rubber, or the like, may be attached to an inner edge portion of the door 120 to maintain airtightness between the door 120 and the refrigerator body 110.

[0054] Also, the door 120 may be connected to the refrigerator body 110 by the hinge 130, and supported to be rotatable in a forward/backward direction with respect to the refrigerator body 110. A preset opening angle of the door 120 is secure such that a storage item kept in the storage chamber can be easily taken in and out. For example, the door 120 may be opened at an angle of 120 degrees.

[0055] A hinge accommodation part 122 may be provided on an upper side of the door 120, and a portion of the hinge 130 may be accommodated in the hinge accommodation part 122, minimizing exposure of the hinge 130.

[0056] The hinge accommodation part 122 may be integrally provided in an upper portion of the door 120 or may be provided separately from the door 120 and detachably installed in an upper portion of the door 120.

[0057] The hinge accommodation part 122 illustrated in FIG. 6 is integrally provided in an upper portion of the door 120. The hinge accommodation part 122 forms an accommodation space accommodating a portion of the hinge 130 on an inner side of the upper portion of the door 120. The hinge 130 is provided in the upper portion and in a lower portion of the refrigerator body 110. In this embodiment, the hinge 130 installed in the upper portion of the refrigerator body 110 will be described.

[0058] The hinge 130 includes a body part 130a, a hook part 130b, and a hinge shaft 132.

[0059] The body part 130a forms a body of the hinge 130. The body part 130a may have a flat plane shape.

[0060] A plurality of fastening holes may be formed in the body part 130a, and the hinge 130 disposed in an upper end of the refrigerator body 110 may be fastened to the refrigerator body 110 by a fastening member such as a screw or a bolt.

[0061] The hook part 130b is formed to protrude forwardly from the body part 130a installed in the refrigerator body 110. An end portion of the hook part 130b is accommodated in the hinge accommodation part 122, and the hook part 130b has a hook shape. An end portion of the hook part 130b is bent toward an outer end portion of the hinge accommodation part 122.

[0062] The hinge shaft 132 is provided at an end portion of the hook part 130b to rotatably support the door 120.

[0063] An upper portion of the hinge shaft 132 may be integrally formed at an end portion of the hook part 130b, or may be rotatably installed in a hinge hole formed at an end portion of the hook part 130b.

[0064] An upper portion of the hinge shaft 132 illustrated in FIG. 7 and FIG. 8 is integrally formed at an end portion of the hook part 130b. Also, a lower portion of the hinge shaft 132 extends in a directly downward direction and rotatably inserted and installed within the door 120. A curved portion 125 may be configured to be rounded with a preset curvature at an outer end portion of the door 120. An outer end portion of the hinge accommodation part 122 may form a portion of the curved portion 125.

[0065] A portion of the hook part 130b may be configured to be bent to have a curvature corresponding to the curvature of the curved portion 125. Accordingly, even though a thickness of the outer end portion of the door 120 is reduced, opening and closing performance of the existing door may be maintained in a state in which the shape of the hook part 130b is maintained.

[0066] A specific structure of the hinge 130 will be described with reference to FIG. 7 and FIG. 8.

[0067] The body part 130a may have a rectangular flat plate shape. A plurality of bead portions 131 may locally protrude in an upward direction from an upper surface of edge portions of the body part 130a to reinforce strength of the body part 130a.

[0068] The hook part 130b may be coplanar with the body part 130a.

[0069] One side of the hook part 130b may be disposed to face an inner end portion of the hinge accommodation part 122, and may be aligned with one side of the body part 130a. One side of the hook part 130b may extend from one side of the body part 130a on the same plane.

[0070] The other side of the hook part 130b is configured to be concave with a preset curvature. When the door 120 is opened at a maximum angle, at least a portion of the other side of the hook part 130b may face an outer end portion of the hinge accommodation part 122 (please refer to FIG. 11).

[0071] A protrusion portion 130b2 may be configured to protrude from an upper surface of the hook part 130b in an upward direction. The protrusion portion 130b2 may be have a shape corresponding to the hook part 130b. The protrusion portion 130b2 may occupy a great part of an entire area excluding an edge portion of the hook part 130b. Thus, strength of the hinge 130, in particular, strength of the hook part 130b may be reinforced.

[0072] At least a portion of the protrusion portion 130b2 may be disposed to overlap a portion of an upper surface of the refrigerator body 110 in a vertical direction. Accordingly, when a bending load of the door acts on an end portion of the hook part 130b, it may properly tolerate the bending load.

[0073] FIG. 9 is a conceptual view illustrating a configuration in which a portion of the hinge 130 is inserted into the hinge accommodation part when the door 120 is closed according to an embodiment of the present dis-

closure, and FIG. 10 is a conceptual view, viewed from above, illustrating a configuration in which the hinge 130 is coupled to a ring portion 124 provided on an inner side of the hinge accommodation part 122 in FIG. 9.

[0074] FIG. 11 is a conceptual view, viewed from above, illustrating a configuration in which an outer end portion of the hinge accommodation part 122 is disposed to face a portion of an inner surface of the hook part 130b when the door is opened according to an embodiment of the present disclosure, and FIG. 12 is a conceptual view, viewed from above, illustrating a configuration in which the hinge 130 is coupled to the ring portion 124 provided on an inner side of the hinge accommodation part 122 in FIG. 11.

[0075] When the door 120 is opened or closed, an outer end portion of the hinge accommodation part 122 rotates centered on the hinge shaft 134.

[0076] The hinge shaft 134 is disposed is disposed to be spaced apart from a front end portion of the refrigerator body 110 forwardly. Also, the hinge shaft 34 is disposed on an inner side than the outer surface in a direction perpendicular to the right outer surface of the refrigerator body 110 with respect to the user who is standing in front of the refrigerator 100 (e2).

[0077] In order to secure a safety distance for preventing the user's finger from pinching between the refrigerator 110 and the door 120, the hinge shaft 134 is disposed to be spaced apart from a front end portion of the refrigerator body 110 forwardly at a wider interval than the safety distance (e1).

[0078] Here, a rotational radius of an outer end portion of the hinge accommodation part 122 is determined according to a position in which the hinge shaft 134 is coupled to the hinge accommodation part 122. Also, when the door 120 is opened or closed, a shape of a pocket part 130b1 formed on an inner side of the hook part 130b to avoid interference between an outer end portion of the hinge accommodation part 122 and the hinge 130 may be varied.

[0079] The hook part 130b has a hook shape in order to avoid interference with an outer end portion of the hinge accommodation part 122 when the door 120 is opened or closed, and has the pocket part 130b1. Also, in a state in which a portion of the hook part 130b is accommodated in the hinge accommodation part 122, a lower portion of the hinge shaft 134 may be insertedly installed to be rotatable in the ring portion 124 provided on a lower surface of the hinge accommodation part 122.

[0080] The ring portion 124 covers an outer circumferential surface of the hinge shaft 132 and has an insertion hole for inserting the hinge shaft 132 on an inner side thereof.

[0081] As illustrated in FIG. 11 and FIG. 12, in a state in which the door 120 is opened at a maximum angle, an outer end portion of the hinge accommodation part 122 is disposed to face a portion of the other side of the hook part 130b.

[0082] Here, the other side of the hook part 130b is configured to face an outer end portion of the hinge accommodation part 122 when the door 120 is opened. The pocket part 130b1 is formed to be concave with a preset curvature. The pocket part 130b may include a concave portion 130b1' and a concave portion 130b1". The concave portion 130b1' is formed to be concave with a radius of curvature greater than a radius of gyration of an outer end portion of the hinge accommodation part 122. Accordingly, the outer end portion of the hinge accommodation part 122 may be rotated without being interfered with the hinge 130.

[0083] The convex portion 130b1" faces the concave portion 130b1' and is provided to be convex toward the hinge shaft 134. The convex portion 130b1" extends from the concave portion 130b1' to the hinge shaft 132. Also, A hinge ring portion is integrally formed at an end portion of the concave portion 130b1", and an upper portion of the hinge shaft 134 is inserted through the hinge ring portion so as to be integrally provided.

[0084] Since the protrusion portion 130b2 protrudes from an upper surface of the hook part 130b in a thickness direction, bending stress and durability of the hinge 130 with respect to a load of the door 120 in a gravitation direction when the door 120 is opened and close may be enhanced.

[0085] Also, a hinge cover 115 may be detachably installed at a front end portion of the upper side of the refrigerator body 110. At least a portion of the hinge cover 115 is disposed to cover the body part 130a of the hinge 130. Accordingly, a fastening member fastened to the hinge 130 and the bead portion 131 of the hinge 130 are covered by the hinge cover 115, obtaining a fine appearance.

[0086] Also, since the bead portion 131 protrude from the body part 130a, strength and durability of the hinge 130 may be increased.

[0087] FIG. 13 is a conceptual view illustrating an upper cap 200 provided separately from the door 120 according to an example, and FIG. 14 is an enlarged conceptual view of a hinge accommodation part 222 of FIG. 13.

[0088] As illustrated in FIG. 13, the upper cap 200 may be provided separately from the door and detachably installed on an upper side of the door.

[0089] A hinge accommodation part 222 may be provided on an inner side of one end portion of the upper cap 200.

[0090] A hinge installation part 223 may be provided on an lower surface of the hinge accommodation part 222.

[0091] The ring portion 124 may be provided in the hinge installation part 223. The ring portion 124 may be disposed to lean toward one side within the hinge installation part 223 so as to be adjacent to an outer end portion of the hinge accommodation part 222. The hinge installation part 223 may be formed of a material different from a material of the hinge accommodation part 222. The ring portion 124 is directly in contact with the hinge shaft, fre-

quently generating frictional contact, and thus, the ring portion 124 and the hinge installation part 223 may be formed of a material having excellent wear resistance such as POM, or the like.

[0092] Referring to Figs. 10 and 12, The hinge installation part 223 includes a through hole 126, a plurality of reinforcing portions 127, and a plurality of reinforcing ribs 128.

[0093] The through hole 126 is provided on an inner side of the hinge installation part 123 in a penetrating manner in a vertical direction.

[0094] The plurality of reinforcing portions 127 are disposed within the through hole 126. Any one of the plurality of reinforcing portions 127 is disposed to be externally engaged with the ring portion 124.

[0095] Each of the plurality of reinforcing ribs 128 is connected to the hinge installation part 123 in one end thereof and connected to the plurality of reinforcing portions 127 in the other end thereof, connecting the reinforcing portions 127 and the hinge installation part 123.

[0096] Referring to FIG. 9 to FIG. 12, the pocket portion 130b1 may selectively accommodate an end portion of the hinge accommodation part 122 when the door 120 is opened or closed. For example, in a state in which the door 120 is closed, an outer end portion of the hinge accommodation part 122 is positioned outside of the pocket portion 130b1. Conversely, when the door 120 is opened, the outer end portion of the hinge accommodation part 122 is inserted into a pocket space formed by the pocket portion 130b1.

[0097] The other side of the hook part 130b is formed to be concave in order to avoid mutual interference between the hinge 130 and the door 120. One side of the hook part 130b may have a linear shape. Accordingly, a width of the hook part 130b in a horizontal direction may be formed to be narrowed toward the hinge shaft 132.

[0098] The concave portion 130b1' has a shape of a curved surface with a predetermined radius of curvature, and the radius curvature of the concave portion 130b1' is greater than a radius of rotation of the outer end portion of the hinge accommodation part 122. Thus, when an end portion of the hinge accommodation part 122 rotates centered on the hinge shaft 132, the door 120 avoids interference with the hinge 130.

[0099] The pocket portion 130b1 is opened toward the outer end portion of the hinge accommodation part 122, and thus, when the door 120 is opened, the outer end portion of the hinge accommodation part 122 may be inserted into the pocket space of the pocket portion 130b1.

[0100] A hand insertion recess 121 may be provided in an upper end portion of the door 120 to allow the user to easily pull the door 120 to open it. Also, as illustrated in FIG. 13, a hand insertion recess 221 may be provided at one end portion of the upper cap 200. The hand insertion recess 221 may be formed on the opposite side of the hinge accommodation part 22. The hand insertion recess 221 may be disposed to be higher than the hinge accommodation part 222.

[0101] As illustrated in FIG. 4, the hand insertion recess 121 may be positioned on the left side of the upper end portion of the door 120 when the user views the door 120 in front of the refrigerator body 110. The hand insertion recess 121 may be formed separately from a door handle unit installed on a front side of the door 120.

[0102] Referring to FIG. 6, an infrared transmission unit 116 may be provided on a front side of the hinge cover 115.

[0103] The infrared transmission unit 116 may be provided to detect whether the door 120 is opened.

[0104] An infrared reception unit 117 may be provided in an upper side of the door 120. The infrared reception unit 117 may be disposed to face the infrared transmission unit 116 when the door 120 is closed.

[0105] As for the refrigerator 100 described above, the configuration and method according to the exemplary embodiments of the present disclosure described above are not limited in its application, but the entirety or a portion of the exemplary embodiments may be selectively combined to be configured into various modifications.

[0106] The foregoing embodiments and advantages are merely exemplary and are not to be considered as limiting the present disclosure. The present teachings can be readily applied to other types of apparatuses. This description is intended to be illustrative, and not to limit the scope of the claims. Many alternatives, modifications, and variations will be apparent to those skilled in the art. The features, structures, methods, and other characteristics of the exemplary embodiments described herein may be combined in various ways to obtain additional and/or alternative exemplary embodiments.

[0107] As the present features may be embodied in several forms without departing from the characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be considered broadly within its scope as defined in the appended claims, and therefore all changes and modifications that fall within the metes and bounds of the claims are therefore intended to be embraced by the appended claims.

Claims

1. A refrigerator comprising:

a refrigerator body (110) having a storage chamber for keeping food therein;
a door (120) rotatably installed in the refrigerator body (110) and opening and closing the storage chamber;
a hinge (130) connecting an upper side of the door (120) and an upper side of the refrigerator body (110) such that the door (120) is rotatable forwardly and backwardly with respect to the re-

frigerator body (110); and
a hinge accommodation part (122,222) provided on an upper side of the door (120) and accommodating a portion of the hinge (130),
wherein the hinge (130) includes:

a body part (130a) installed in the refrigerator body (110);
a hook part (130b) protruding from the body part (130a) and bent toward an outer end portion of the hinge accommodation part (122,222) in a state in which an end portion thereof is accommodated in the hinge accommodation part (122,222); and
a hinge shaft (132) provided at an end portion of the hook part (130b) and rotatably installed within the door (120),
wherein the refrigerator further comprises:

a hinge installation part (223) provided separately from the hinge accommodation part (122, 222) and detachably coupled to a lower surface of the hinge accommodation part (122, 222), the hinge installation part (223) being provided on the lower surface of the hinge accommodation part (122, 222),
wherein the hinge installation part (223) has a ring portion (124) covering an outer circumferential surface of the hinge shaft (132) and having an insertion hole for inserting the hinge shaft (132) therein,
wherein the hinge installation part (223) comprises:

a through hole (126) formed on an inner side in a penetrating manner in a vertical direction;
a plurality of reinforcing portions (127) provided in the through hole (126) and externally engaged with the ring portion (124); and
a plurality of reinforcing ribs (128) connecting the plurality of reinforcing portions (127) and the hinge installation part (223).

2. The refrigerator of claim 1, wherein a curved portion (125) is rounded at an outer end portion of the door (120), and an outer end portion of the hinge accommodation part (122,222) forms a portion of the curved portion (125).

3. The refrigerator of claim 2, wherein a portion of the hook part (130b) is bent to have a curvature corresponding to a curvature of the curved portion (125).

4. The refrigerator of claim 3, wherein the hook part (130b) and the body part (130a) are coplanar.

5. The refrigerator of claim 3, wherein one side of the hook part (130b) is disposed to face an inner end portion of the hinge accommodation part (122,222) and aligned with one side of the body part (130a), and the other side of the hook part (130b) is concave with a preset curvature and at least a portion of the other side of the hook part (130b) is disposed to face an outer end portion of the hinge accommodation part (122,222) when the door (120) is opened at a maximum angle.

6. The refrigerator of claim 3, wherein a protrusion portion (130b2) protrudes upwardly from an upper surface of the hook part (130b) and has a shape corresponding to the hook part (130b).

7. The refrigerator of claim 6, wherein at least a portion of the protrusion portion (130b2) may be disposed to overlap an upper surface of the refrigerator body (110) in a vertical direction.

8. The refrigerator of claim 1, further comprising:

an upper cap (200) detachably installed on an upper side of the door (120),
wherein the hinge accommodation part (222) is provided within one side of the upper cap (200).

9. The refrigerator of claim 1, further comprising:
a hinge cover (115) detachably installed at an upper front end portion of the refrigerator body (110) such that at least a portion thereof covers the body part.

Patentansprüche

1. Kühlschrank, umfassend:

einen Kühlschrankkörper (110) mit einer Lagerkammer zum Aufbewahren von Lebensmitteln darin;
eine Tür (120), die drehbar in dem Kühlschrankkörper (110) installiert ist und die Aufbewahrungskammer öffnet und schließt;
ein Scharnier (130), das eine Oberseite der Tür (120) und eine Oberseite des Kühlschrankkörpers (110) verbindet, sodass die Tür (120) in Bezug auf den Kühlschrankkörper (110) vorwärts und rückwärts drehbar ist; und
ein Scharnieraufnahmeteil (122, 222), das an einer Oberseite der Tür (120) vorgesehen ist und einen Abschnitt des Scharniers (130) aufnimmt,
wobei das Scharnier (130) Folgendes beinhaltet:

einen Körperteil (130a), der in dem Kühlschrankkörper (110) installiert ist;
einen Hakenteil (130b), der von dem Körperteil (130a) vorsteht und in Richtung eines äußeren Endabschnitts des Scharnieraufnahmeteils (122, 222) in einem Zustand gebogen ist, in dem ein Endabschnitt davon in dem Scharnieraufnahmeteil (122, 222) aufgenommen ist; und
eine Scharnierwelle (132), die an einem Endabschnitt des Hakenteils (130b) vorgesehen und drehbar in der Tür (120) installiert ist,
wobei der Kühlschrank ferner Folgendes umfasst:

ein Scharnierinstallationsteil (223), das separat von dem Scharnieraufnahmeteil (122, 222) bereitgestellt ist und lösbar an eine untere Fläche des Scharnieraufnahmeteils (122, 222) gekoppelt ist, wobei das Scharnierinstallationsteil (223) an der unteren Fläche des Scharnieraufnahmeteils (122, 222) vorgesehen ist,
wobei das Scharnierinstallationsteil (223) einen Ringabschnitt aufweist, der eine Außenumfangsfläche der Scharnierwelle (132) abdeckt und ein Einführloch zum Einführen der Scharnierwelle (132) darin aufweist,
wobei das Scharnierinstallationsteil (223) Folgendes umfasst:

ein Durchgangsloch (126), das auf einer Innenseite in einer vertikalen Richtung durchdringend ausgebildet ist;
eine Vielzahl von Verstärkungsabschnitten (127), die in dem Durchgangsloch (126) bereitgestellt sind und außen mit dem Ringabschnitt (124) in Eingriff stehen; und
eine Vielzahl von Verstärkungsrippen (128), die die Vielzahl von Verstärkungsabschnitten (127) und das Scharnierinstallationsteil (223) verbinden.

2. Kühlschrank nach Anspruch 1, wobei ein gekrümmter Abschnitt (125) an einem äußeren Endabschnitt der Tür (120) abgerundet ist und ein äußerer Endabschnitt des Scharnieraufnahmeteils (122, 222) einen Abschnitt des gekrümmten Abschnitts (125) ausbildet.

3. Kühlschrank nach Anspruch 2, wobei ein Abschnitt des Hakenteils (130b) gebogen ist, um eine Krümmung aufzuweisen, die einer Krümmung des gekrümmten Abschnitts (125) entspricht.

4. Kühlschrank nach Anspruch 3, wobei der Hakenteil (130b) und der Körperteil (130a) koplanar sind.

5. Kühlschrank nach Anspruch 3, wobei eine Seite des Hakenteils (130b) so angeordnet ist, dass sie einem inneren Endabschnitt des Scharnieraufnahmeteils (122, 222) zugewandt und auf eine Seite des Körperteils (130a) ausgerichtet ist, und
die andere Seite des Hakenteils (130b) konkav mit einer vorgegebenen Krümmung ist und mindestens ein Abschnitt der anderen Seite des Hakenteils (130b) so angeordnet ist, dass er einem äußeren Endabschnitt des Scharnieraufnahmeteils (122, 222) zugewandt ist, wenn die Tür (120) in einem maximalen Winkel geöffnet ist.

6. Kühlschrank nach Anspruch 3, wobei ein Vorsprungsabschnitt (130b2) von einer oberen Oberfläche des Hakenteils (130b) nach oben vorsteht und eine Form aufweist, die dem Hakenteil (130b) entspricht.

7. Kühlschrank nach Anspruch 6, wobei mindestens ein Abschnitt des Vorsprungsabschnitts (130b2) so angeordnet sein kann, dass er eine obere Fläche des Kühlschrankkörpers (110) in einer vertikalen Richtung überlappt.

8. Kühlschrank nach Anspruch 1, ferner umfassend:

eine obere Kappe (200), die abnehmbar an einer Oberseite der Tür (120) installiert ist,
wobei das Scharnieraufnahmeteil (222) innerhalb einer Seite der oberen Kappe (200) bereitgestellt ist.

9. Kühlschrank nach Anspruch 1, ferner umfassend:
eine Scharnierabdeckung (115), die abnehmbar an einem oberen vorderen Endabschnitt des Kühlschrankkörpers (110) installiert ist, sodass mindestens ein Abschnitt davon den Körperteil abdeckt.

Revendications

1. Réfrigérateur comprenant:

un corps de réfrigérateur (110) ayant une chambre de stockage pour y conserver des aliments;
une porte (120) installée rotative dans le corps de réfrigérateur (110) et ouvrant et fermant la chambre de stockage;
une charnière (130) reliant un côté supérieur de la porte (120) et un côté supérieur du corps de réfrigérateur (110) de sorte que la porte (120)

puisse tourner vers l'avant et vers l'arrière par rapport au corps de réfrigérateur (110); et
une partie de logement de charnière (122, 222) prévue sur un côté supérieur de la porte (120) et recevant une partie de la charnière (130),
dans lequel la charnière (130) comprend:

une partie de corps (130a) installée dans le corps du réfrigérateur (110);
une partie de crochet (130b) faisant saillie de la partie de corps (130a) et pliée vers une partie d'extrémité extérieure de la partie de logement de charnière (122, 222) dans un état dans lequel une partie d'extrémité est logée dans la partie de logement de charnière (122, 222); et
un arbre de charnière (132) prévu au niveau d'une partie d'extrémité de la partie de crochet (130b) et installé de manière rotative dans la porte (120),
le réfrigérateur comprenant en outre:

une partie d'installation de charnière (223) prévue séparément de la partie de logement de charnière (122, 222) et couplée de manière amovible à une surface inférieure de la partie de logement de charnière (122, 222), la partie de montage de charnière (223) étant prévue sur la surface inférieure de la partie de logement de charnière (122, 222),
dans lequel la partie d'installation de charnière (223) comporte une partie annulaire recouvrant une surface circonférentielle externe de l'arbre de charnière (132) et comportant un trou d'insertion pour y insérer l'arbre de charnière (132),
dans lequel la partie d'installation de charnière (223) comprend:

un trou traversant (126) formé sur un côté intérieur de manière pénétrante dans une direction verticale;
une pluralité de parties de renforcement (127) prévues dans le trou traversant (126) et en prise extérieure avec la partie annulaire (124); et
une pluralité de nervures de renforcement (128) reliant la pluralité de parties de renforcement (127) et la partie d'installation de charnière (223).

2. Réfrigérateur selon la revendication 1, dans lequel une partie incurvée (125) est arrondie au niveau d'une partie d'extrémité extérieure de la porte (120), et une partie d'extrémité extérieure de la partie de logement de charnière (122, 222) forme une partie de la partie incurvée (125).

3. Réfrigérateur selon la revendication 2, dans lequel une partie de la partie de crochet (130b) est courbée pour avoir une courbure correspondant à une courbure de la partie incurvée (125).

4. Réfrigérateur selon la revendication 3, dans lequel la partie de crochet (130b) et la partie de corps (130a) sont coplanaires.

5. Réfrigérateur selon la revendication 3, dans lequel un côté de la partie de crochet (130b) est disposé pour faire face à une partie d'extrémité intérieure de la partie de logement de charnière (122, 222) et aligné avec un côté de la partie de corps (130a), et
l'autre côté de la partie de crochet (130b) est concave avec une courbure prédéfinie et au moins une partie de l'autre côté de la partie de crochet (130b) est disposée pour faire face à une partie d'extrémité extérieure de la partie de logement de charnière (122, 222) lorsque la porte (120) est ouverte à un angle maximal.

6. Réfrigérateur selon la revendication 3, dans lequel une partie saillante (130b2) fait saillie vers le haut à partir d'une surface supérieure de la partie de crochet (130b) et a une forme correspondant à la partie à crochet (130b) .

7. Réfrigérateur selon la revendication 6, dans lequel au moins une partie de la partie saillante (130b2) peut être disposée de manière à recouvrir une surface supérieure du corps de réfrigérateur (110) dans une direction verticale.

8. Réfrigérateur selon la revendication 1, comprenant en outre:

un capuchon supérieur (200) installé de manière amovible sur un côté supérieur de la porte (120),
dans lequel la partie de logement de charnière (222) est prévue dans un côté du capuchon supérieur (200).

9. Réfrigérateur selon la revendication 1, comprenant en outre:
un couvercle de charnière (115) installé de manière amovible au niveau d'une partie d'extrémité avant supérieure du corps de réfrigérateur (110) de sorte qu'au moins une partie de celui-ci recouvre la partie de corps.

FIG. 1

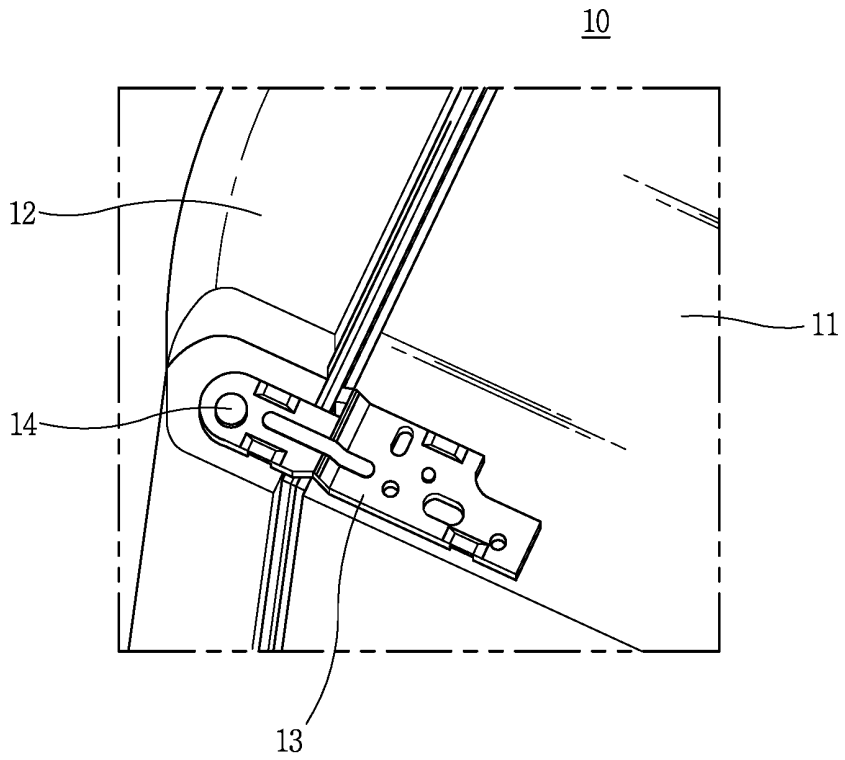


FIG. 2

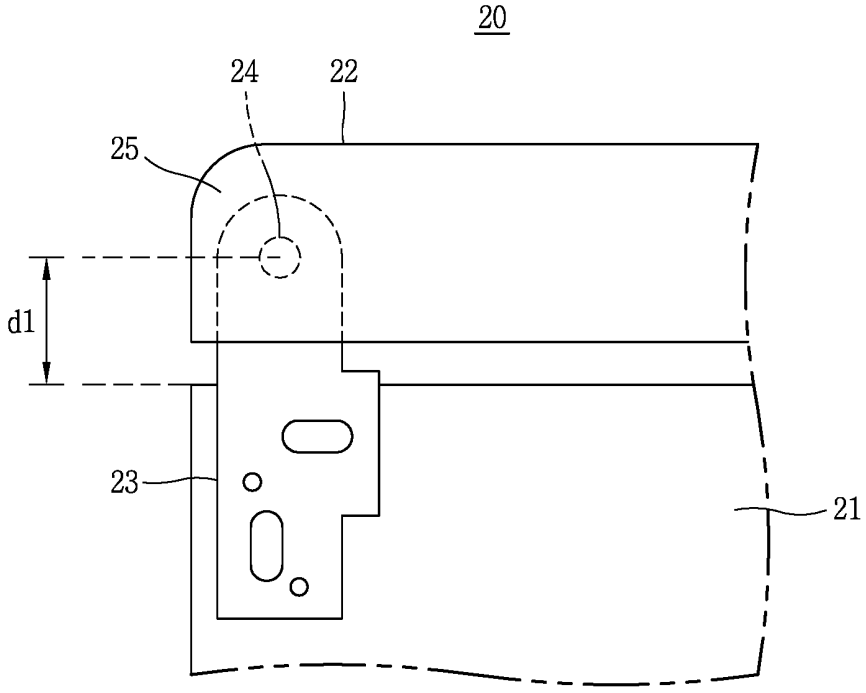


FIG. 3

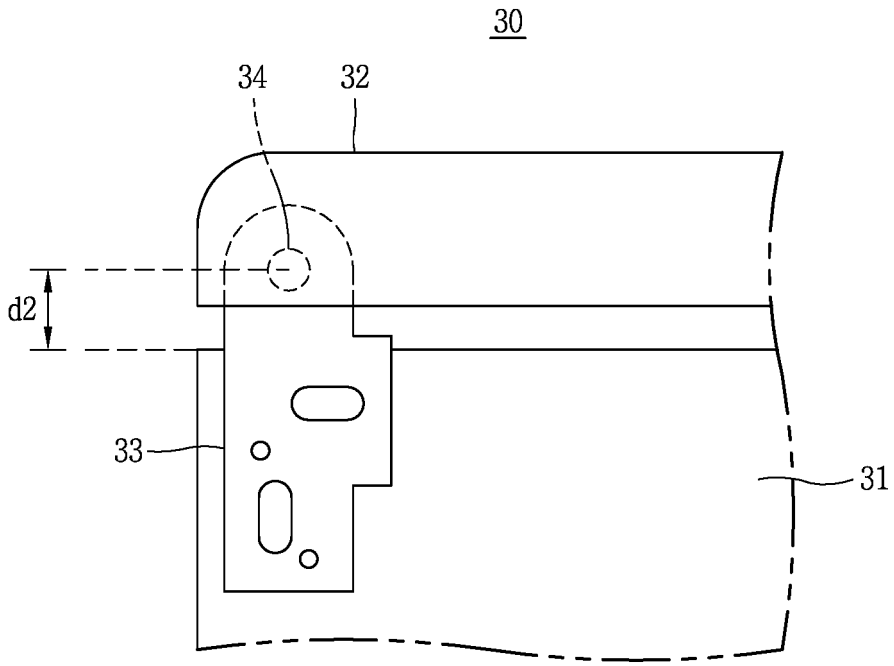


FIG. 4

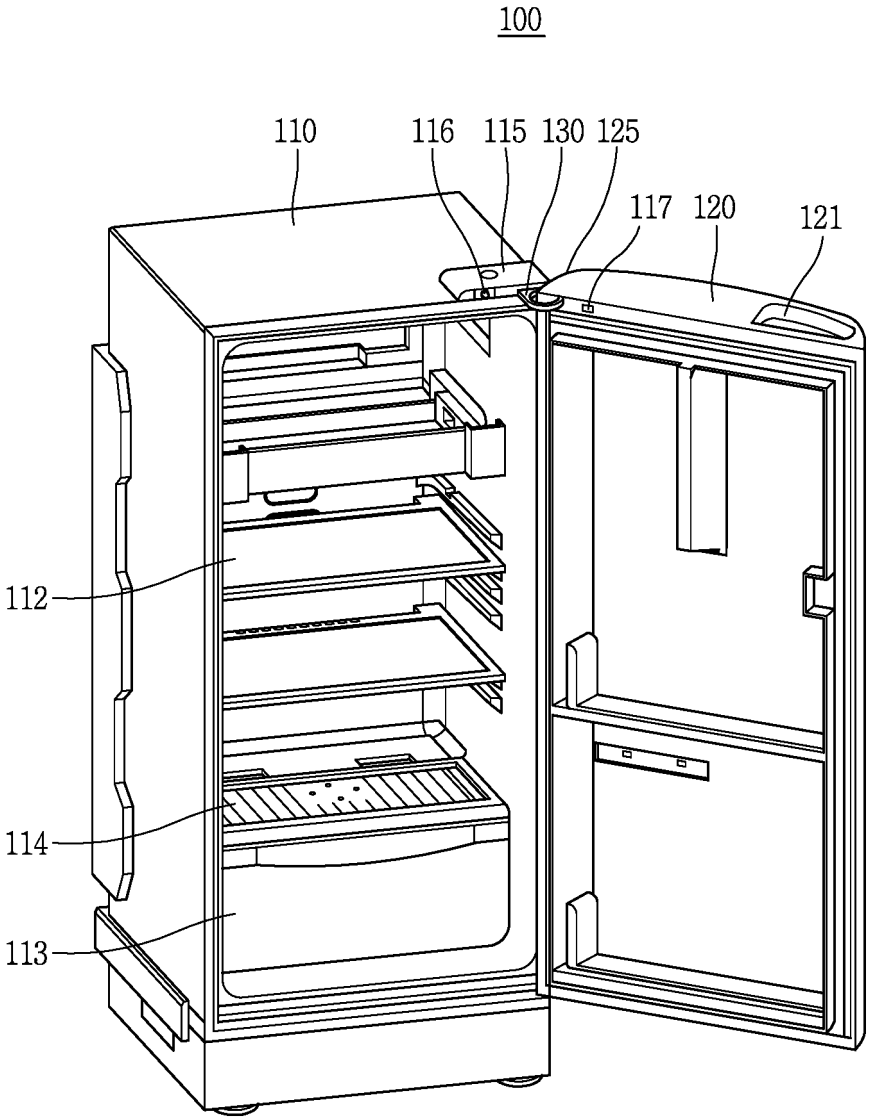


FIG. 5

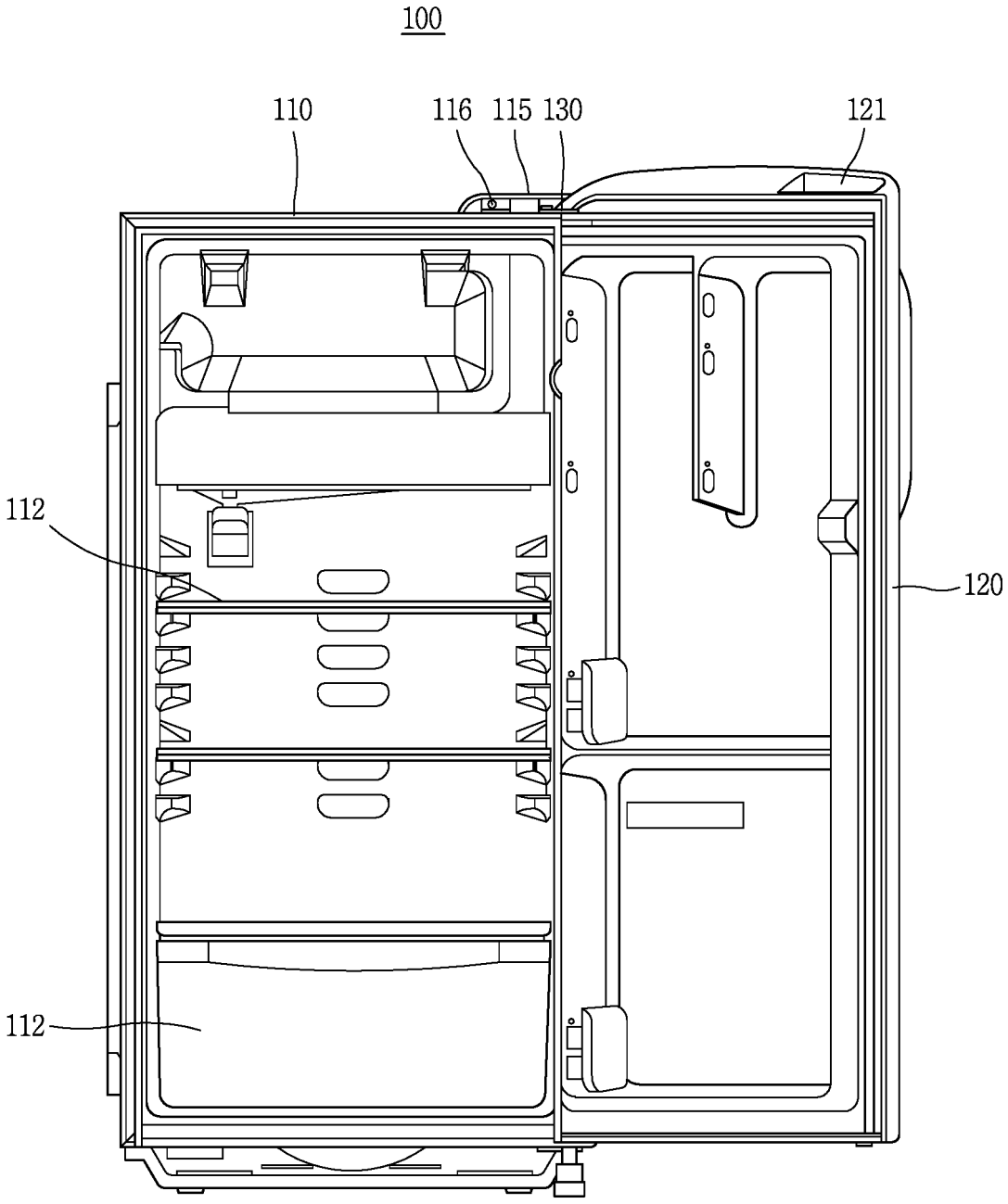


FIG. 6

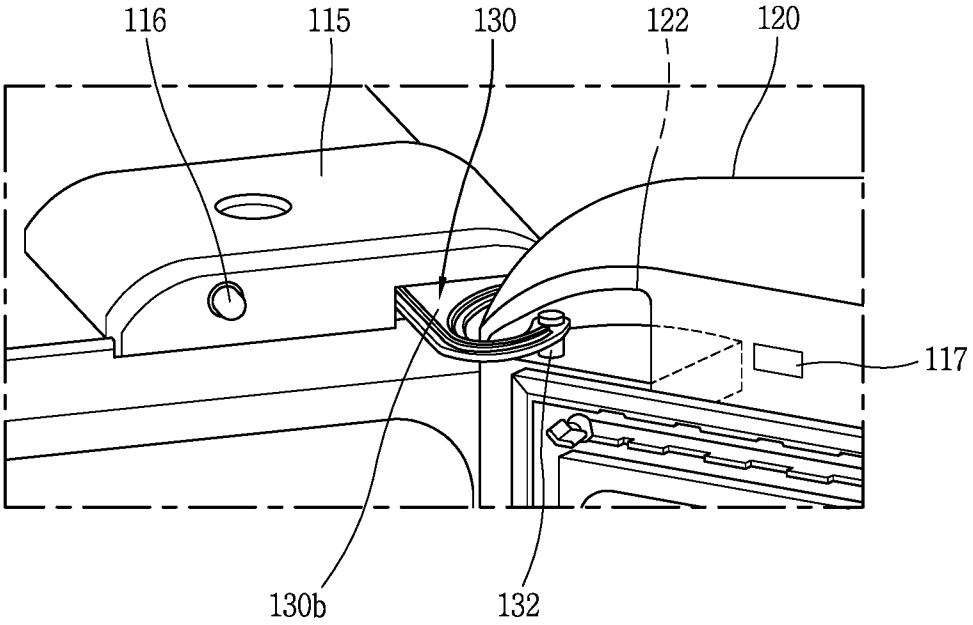

116
115
130
122
120
117
130b
132

FIG. 7

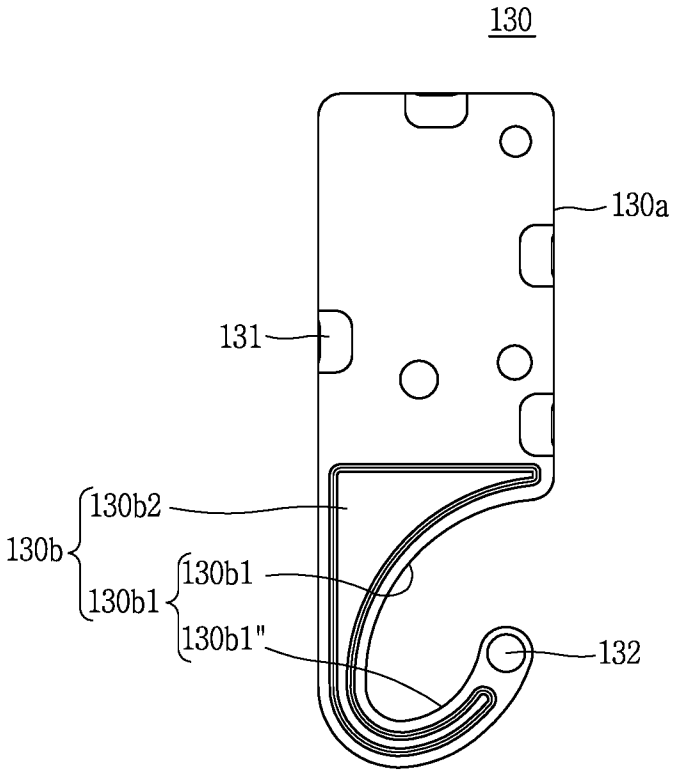

130
130a
131
130b
130b2
130b1
130b1
130b1"
132

FIG. 8

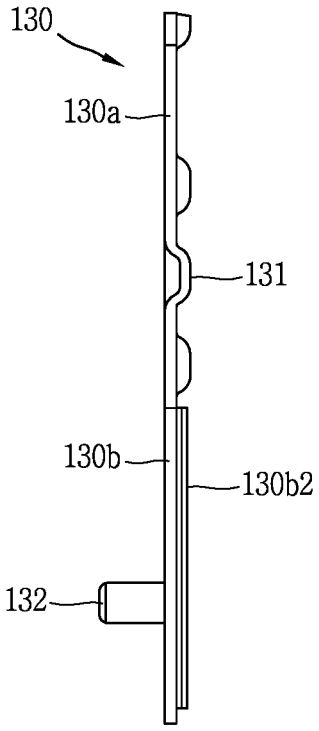

130
130a
131
130b
130b2
132

FIG. 9

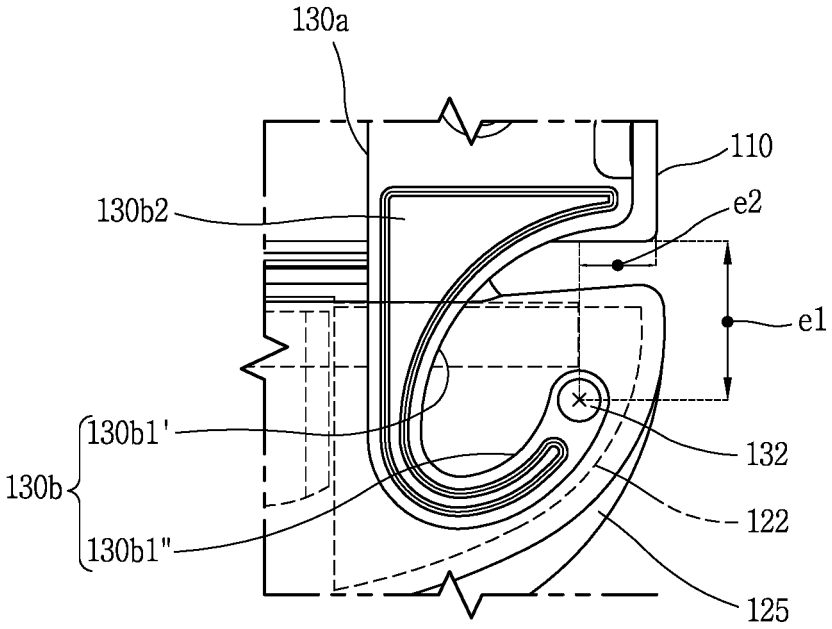

130a
110
130b2
e2
e1
130b1'
130b
130b1"
132
122
125

FIG. 10

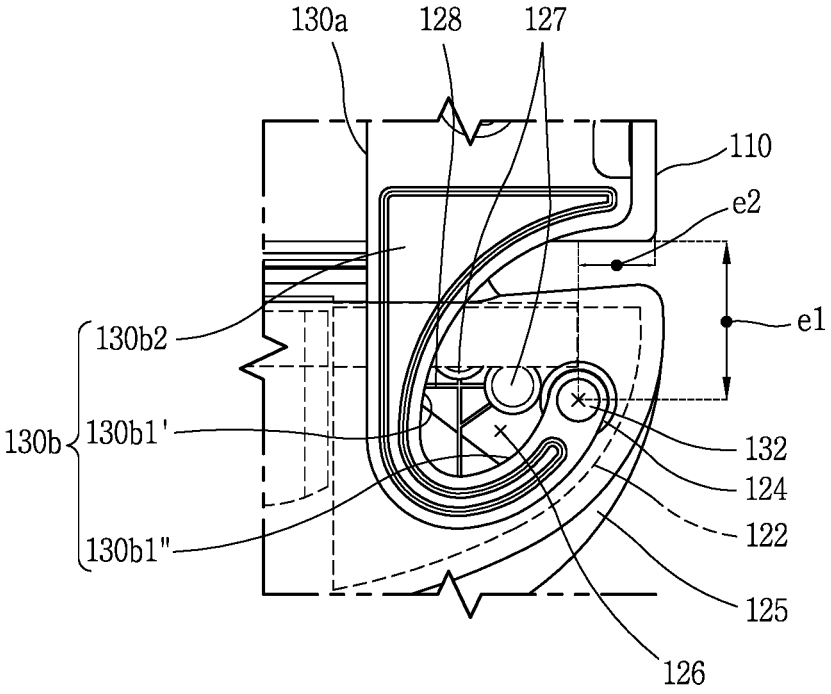

130a
128
127
110
e2
e1
130b2
130b
130b1'
130b1"
132
124
122
125
126

FIG. 11

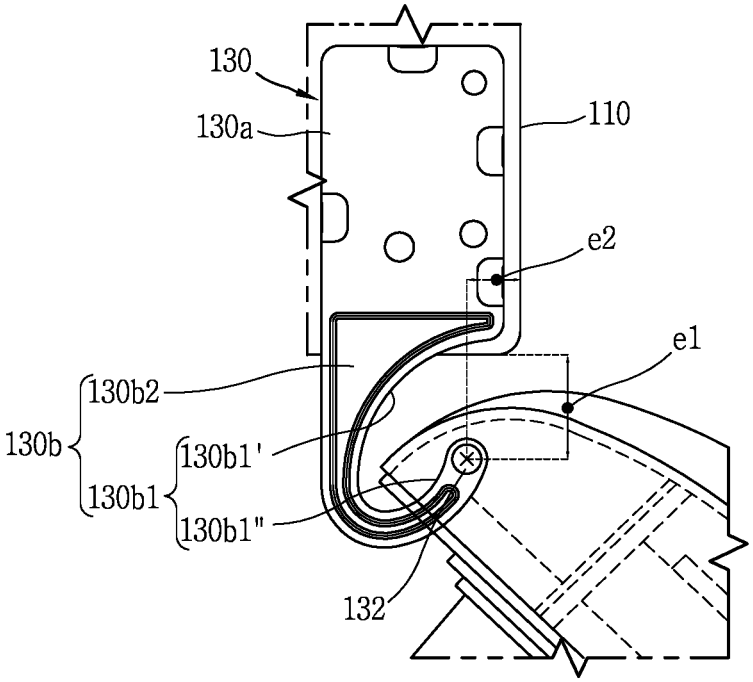

130
130a
110
e2
e1
130b2
130b
130b1'
130b1
130b1"
132

FIG. 12

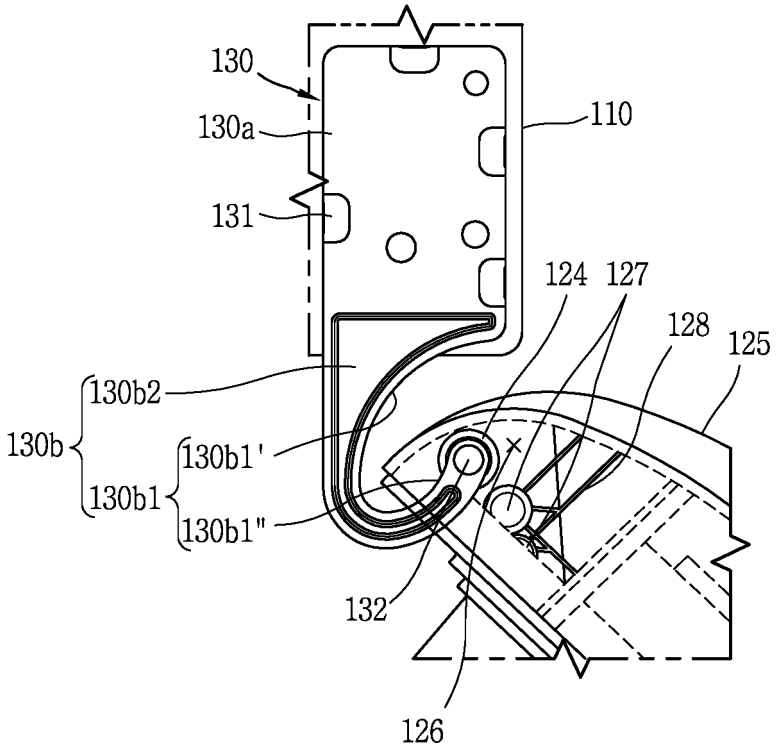

130
130a
131
110
124
127
128
125
130b2
130b
130b1'
130b1
130b1"
132
126

FIG. 13

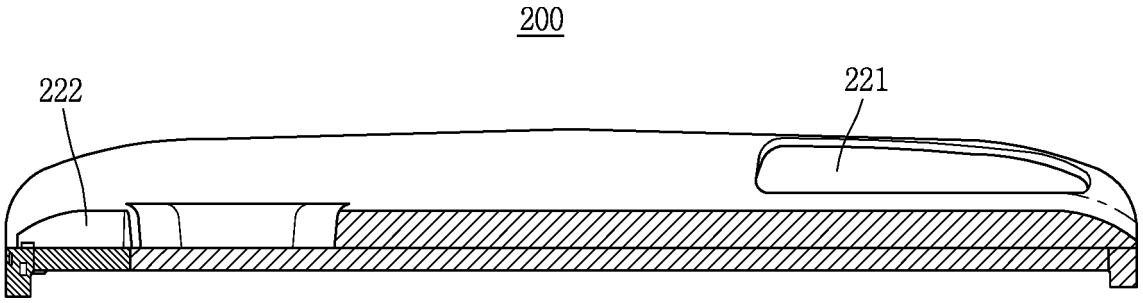
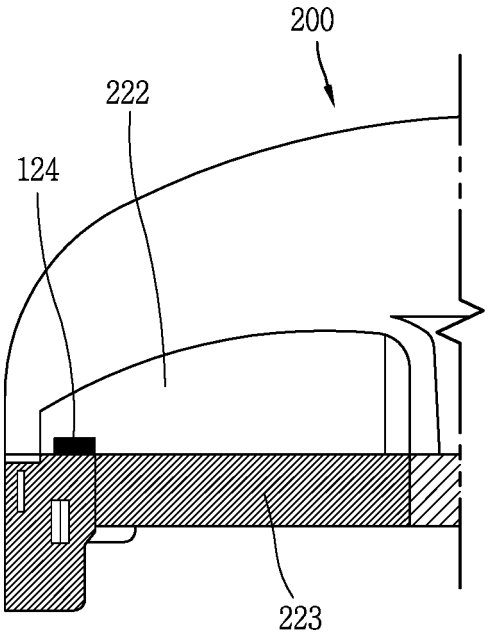


FIG. 14



REFERENCES CITED IN THE DESCRIPTION

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