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(54)

Door for cooling appliance and cooling appliance

(57)

The present invention relates to a door for a cooling appliance and a cooling appliance. A door (1) includes a door body (2) and at least one decoration strip (4) connected to the door body (2). The door body (2) includes a front plate (211), a door lining (22), a pair of side plates (212), an upper end cap (23), a lower end cap (24), and a thermal insulation space enclosed by these members. The decoration strip (4) is connected to a corresponding side plate (212). According to the present invention, one of the upper end cap (23) and the lower end cap (24) includes a stop portion (238) transversely protruding from the side plate (212), a tail end surface (45) of an end of the decoration strip (4) abuts the stop portion (238), and as viewed in a transverse direction of the door, the other end of the decoration strip (4) covers at least a part of a side end surface (249) of the other of the upper end cap (23) and the lower end cap (24).

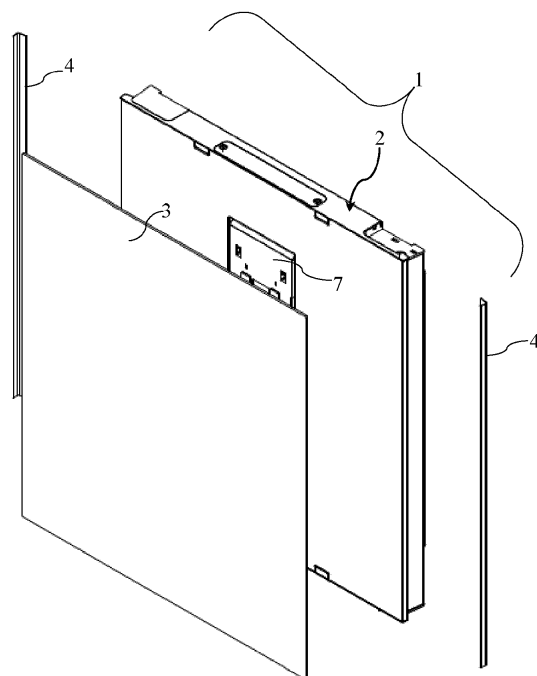


FIG. 2

Description

BACKGROUND

Technical Field

[0001] The present invention relates to a door for a cooling appliance and a cooling appliance, and in particular, to a door, which includes a door body and a decoration strip connected to the door body, for a cooling appliance, and a cooling appliance having such a door.

Related Art

[0002] CN201203325Y discloses a refrigerator door body with a decoration strip, and the decoration strip is connected to an edge of the refrigerator door body. The decoration strip basically extends from an upper end to a lower end of a refrigerator door.

[0003] Due to the existence of a manufacturing tolerance, after being connected to the door body, the decoration strip possibly protrudes from an end of the door body and/or has a big gap from an end of the refrigerator door. This not only increases difficulty of assembling the refrigerator door but also causes an appearance defect of the refrigerator door.

SUMMARY

[0004] An objective of the present invention is to provide a door, that is easy to assemble and can reduce an appearance defect, for a cooling appliance, and a cooling appliance having such as door, for the purpose of solving at least one of the foregoing technical problems.

[0005] The foregoing objective may be implemented by using features in the independent claims. Preferred embodiments of the present invention are subjects of the accompanying drawings, specification, and dependent claims.

[0006] One aspect of the present invention relates to a door for a cooling appliance, including a door body and at least one decoration strip that is connected to the door body, where the door body includes a front plate, a door lining, a pair of side plates, an upper end cap, a lower end cap, and a thermal insulation space enclosed by the front plate, the door lining, the pair of side plates, the upper end cap, and the lower end cap; and the decoration strip is connected to a corresponding side plate; characterized in that, one of the upper end cap and the lower end cap includes a stop portion transversely protruding from the side plate, a tail end surface of an end of the decoration strip abuts the stop portion, and the other end of the decoration strip covers at least a part of a side end surface of the other of the upper end cap and the lower end cap as viewed in a transverse direction of the door.

[0007] Thereby, when the decoration strip is connected to the door body, an end of the decoration strip may be stopped/positioned by using the stop portion; mean-

while, during design, the length of the decoration strip may be appropriately increased to make the other end of the decoration strip cover at least a part of a corresponding side end surface of the other end cap. This not only helps to reduce difficulty of assembling the decoration strip, but also helps to solve a technical problem that a gap appears between two ends of the decoration strip and the end caps, thereby helping to improve appearance quality of the door; this may be implemented without increasing requirement for a manufacturing tolerance.

[0008] It should be understood that, the cooling appliance of the present invention may include electric appliances, such as a refrigerator, a wine cooler, and a freezer, for storing an article to be cooled.

[0009] The decoration strip may longitudinally cover the entire or at least partial wall thickness of the side end surface.

[0010] In an embodiment in which the decoration strip covers the entire width of the side plate, the stop portion may be disposed in the entire width of a corresponding end cap; and in an embodiment in which the decoration strip only covers partial width of the side plate, the stop portion correspondingly is also disposed in a corresponding width range of a corresponding end cap.

[0011] The decoration strip may cover the side plate partially only or completely, and may also cover at least a part of the front plate at the same time when covering the side plate partially or completely.

[0012] The front plate and the side plate may be integrally formed, for example, are integrally formed by using a sheet metal member; and the front plate and the side plate may also be separately manufactured (for example, made of different materials and/or made of different techniques) and then assembled together.

[0013] The door body may include a thermal insulation foaming layer located within the thermal insulation space, and may also include an inert gas filled in the thermal insulation space; and the thermal insulation space may also be vacuum.

[0014] The decoration strip may be bonded or clamped on the door body, and the decoration strip may also be fixed on the door body by using a fixing member such as a screw.

[0015] In a possible embodiment, the stop portion may be disposed on the upper end cap, and as viewed in the transverse direction of the door, a lower end of the decoration strip covers the at least a part of the side end surface. Thereby, even if the lower end of the decoration strip and a bottom surface of the lower end cap are not flush due to a manufacturing tolerance, this only has limited influence on the appearance of the door.

[0016] In a possible embodiment, the at least a part of a side end surface of the other of the upper end cap and the lower end cap is approximately flush with the corresponding side plate, or protrudes from the side plate by a thickness of an adhesion strip used for bonding the decoration strip to the side plate.

[0017] In a possible embodiment, the door may include

a door panel that is made of sheet metal, the door panel includes the front plate and the side plate, and the side plate bends backwards from a longitudinal side of the front plate.

[0018] In a possible embodiment, the side plate includes a handle portion and a side plate rear portion that is connected to a rear side of the handle portion, and the decoration strip is connected to the handle portion.

[0019] In a possible embodiment, the stop portion is a part of a base wall of the upper end cap or the lower end cap, and compared with a main part of the base wall, the stop portion has a reduced wall thickness. This helps to increase a longitudinal coverage rate of the decoration strip, thereby improving the appearance of the door.

[0020] In a possible embodiment, a decoration panel adhered to a front side of the front plate is included, and the decoration strip is entirely located behind the decoration panel.

[0021] In a possible embodiment, a decoration panel connected to the front plate is included, and the decoration strip is entirely located behind the decoration panel.

[0022] In a possible embodiment, a hook portion is provided at a front end of the decoration strip, and the hook portion covers a connecting curved surface connecting the front plate in the transverse direction and the side plate and enters between the connecting curved surface and the decoration panel.

[0023] In a possible embodiment, the decoration strip has a constant and approximately L-shaped cross section, and includes a first plate portion approximately perpendicular to the front plate and a second plate portion bending inwards from a rear side of the first plate portion; and a bonding strip used for bonding the decoration strip and the side plate is disposed between the first plate portion and the side plate.

[0024] Another aspect of the present invention relates to a cooling appliance, including a door of the cooling appliance of any one of the foregoing.

[0025] The structure of the present invention and its other inventive objectives and beneficial effects will be more obvious and comprehensible through the description of the preferred embodiments with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] As a part of the specification and for providing further understanding of the present invention, the following accompanying drawings illustrate specific implementation manners of the present invention, and are used together with the specification to explain principles of the present invention. Where:

FIG. 1 is a schematic three-dimensional diagram of a door for a cooling appliance according to a preferred embodiment of the present invention;

FIG. 2 is a schematic exploded diagram of a door

for a cooling appliance according to a preferred embodiment of the present invention;

FIG. 3 is a schematic exploded diagram of a door body according to a preferred embodiment of the present invention;

FIG. 4 is a schematic partial three-dimensional diagram of an upper end cap according to a preferred embodiment of the present invention;

FIG. 5 is a schematic partial three-dimensional diagram of a lower end cap according to a preferred embodiment of the present invention;

FIG. 6 is a schematic sectional diagram in a direction I-I in FIG. 1;

FIG. 7 is a bottom diagram of a decoration strip according to a preferred embodiment of the present invention;

FIG. 8 is a schematic partial enlarged diagram of a section along a direction II-II of a part A in FIG. 1; and

FIG. 9 is a schematic partial enlarged diagram of a section along a direction II-II of a part B in FIG. 1.

DETAILED DESCRIPTION

[0027] FIG. 1 is a schematic three-dimensional diagram of a door 1 for a cooling appliance according to a preferred embodiment of the present invention. The door 1 is connected to a box body (not shown) of the cooling appliance (not shown) to close at least a part of a storage compartment or at least one storage compartment in the box body. In this embodiment, the door 1 may be pivotally connected to the box body; in an alternative embodiment, a door may also be connected to the box body in a push-and-pull manner.

[0028] As shown in FIG. 1 and FIG. 2, the door 1 includes a door body 2, a decoration panel 3 connected to a front side of the door body 2, and a pair of decoration strips 4 connected to a corresponding side of the door body 2. In this embodiment, the decoration panel 3 is made of toughened glass.

[0029] As shown in FIG. 2 and FIG. 3, the door body 2 includes a door panel 21, a door lining 22, an upper end cap 23, a lower end cap 24, and a thermal insulation layer 25 (shown in FIG. 6 and FIG. 8) located within a space enclosed by the door panel 21, the door lining 22, the upper end cap 23, and the lower end cap 24.

[0030] The door panel 21 is a sheet metal member, and includes a front plate 211 and a pair of side plates 212 separately bending backwards and extending from a corresponding longitudinal side edge of the front plate 211. The door lining 22 is connected to rear ends of the side plates 212, and is at a predetermined distance away

from the front plate 211. A rear end of a side plate 212 may include a connecting plate portion 2123 bending inwards and approximately parallel to the front plate 211, and the door lining 22 is connected to the connecting plate portion 2123.

[0031] The upper end cap 23 and the lower end cap 24 are respectively connected to upper ends and lower ends of the door panel 21 and the door lining 22. The upper end cap 23 and the lower end cap 24 have basically the same structures of connection to the door panel 21, and therefore in the following descriptions, same technical terms are used for technical features that have same functions and/or structures, and different reference numerals are used.

[0032] As shown in FIG. 3, FIG. 4, and FIG. 5, the upper end cap 23 and the lower end cap 24 respectively have base walls 230 and 240 extending in a transverse direction of the door, and the base walls 230 and 240 respectively form a top wall and a bottom wall of the door 1. The upper end cap 23 and the lower end cap 24 further respectively include front connecting edges 231 and 241 and a pair of slots 232 and 242, where the front connecting edges 231 and 241 are connected to the corresponding base walls 230 and 240 and extend on a vertical plane, and the pair of slots 232 and 242 are located at a corresponding side end. The front connecting edges 231 and 241 respectively form at least a part of a front surface of the upper end cap 23 and the lower end cap 24, and are located on a same vertical plane. A pair of slots 232 are located at a left end and a right end of the upper end cap 23, and have downward openings and are parallel to the side plate 212; the other pair of slots 242 are located at a left end and a right end of the lower end cap 24, and have upward openings and are parallel to the side plate 212. The upper end cap 23 and the lower end cap 24 respectively include rib edges 233 and 243 connected to side ends of the corresponding base walls 230 and 240 and extending vertically, and the rib edges 233 and 243 form outer slot walls of the corresponding slots 232 and 242.

[0033] The base walls 230 and 240 of the upper end cap 23 and the lower end cap 24 respectively extend forward to slightly protrude from the front surfaces of the corresponding front connecting edges 231 and 241 to form an upper stop portion 234 and a lower stop portion 244.

[0034] During assembly, inner surfaces of an upper edge portion and a lower edge portion of the front plate 211 are respectively propped on the front surfaces of the front connecting edges 231 and 241 of the upper end cap 23 and the lower end cap 24; upper and lower edge portions of each side plate 212 are inserted into the corresponding slots 232 and 242 of the upper end cap 23 and the lower end cap 24, as shown in FIG. 6. In addition, upper and lower end surfaces of the front plate 211 may be stopped by the upper stop portion 234 and the lower stop portion 244, so as to limit longitudinal movement of the front plate 211. Therefore, the door panel 21 is fixed

to the upper end cap 23 and the lower end cap 24.

[0035] As shown in FIG. 4 to FIG. 6, in this embodiment, the slots 232 and 242 are respectively disposed only at rear portions of the upper end cap 23 and the lower end cap 24, and front portions of the upper end cap 23 and the lower end cap 24 include side connecting edges 235 and 245 connected to the corresponding front connecting edges 231 and 241. The side plate 212 includes a handle portion 2121 and a side plate rear portion 2122, where the handle portion 2121 is connected to the front plate 211 and is approximately L-shaped, and the side plate rear portion 2122 is connected to a rear side of the handle portion 2121 and extends backwards. The side connecting edges 235 and 245 have a cross section of a shape similar to that of the handle portion 2121, inner surfaces of upper and lower edge portions of the handle portion 2121 respectively are propped on the corresponding side connecting edges 235 and 245, and upper and lower ends of the side plate rear portion 2122 are inserted into the slots 232 and 242. The decoration strips 4 are connected to the handle portion 2121 and cover the upper and lower edge portions of the handle portion 2121.

[0036] As shown in FIG. 2, the upper edge portion and the lower edge portion of the front plate 211 separately include multiple concave portions 2115 concave inwards; the upper end cap 23 and the lower end cap 24 respectively include support ribs 236 and 246 inserted into the corresponding concave portions 2115. The support ribs 236 and 246 are connected to the corresponding base walls 230 and 240, and are disposed basically parallel to the front plate 211.

[0037] The support ribs 236 and 246 are adjacent to the front connecting edges 231 and 241, and are separated from the front connecting edges 231 and 241 by a gap G, so that the support ribs 236 and 246 are inserted into the concave portions 2115. The upper and lower edge portions of the front plate 211 are separately clamped in the gap G. After the assembly, front surfaces of the support ribs 236 and 246 do not protrude from a front surface of the front plate 211.

[0038] In a foaming procedure, a foaming agent is injected into a door tray component that is formed by the door panel 21, the upper end cap 23, and the lower end cap 24; and then the door lining 22 is connected to a door tray with the foaming agent, and the door panel 21, the upper end cap 23, the lower end cap 24, and the door lining 22 are tightly combined with the thermal insulation layer 25 that is formed by the foaming agent.

[0039] As shown in FIG. 6, the decoration panel 3 is adhered to the door body 2 by using a first adhesion apparatus 6. The adhesion apparatus 6 is preferably an adhesive tape. The first adhesion apparatus 6 is distributed along four edge portions of the front plate 211, and the decoration panel 3 is adhered to the front plate 211 by using the first adhesion apparatus 6.

[0040] The decoration strip 4 may be an aluminum extrusion member, is connected to the side plate 212, and

is entirely behind the decoration panel 3. The decoration strip 4 covers the upper and lower edge portions of the handle portion 2121, but essentially extends along approximately the entire height of the handle portion 2121.

[0041] In this embodiment, the decoration strip 4 is connected to the handle portion 2121. A bonding strip 63 such as a double-sided adhesive tape is disposed between the decoration strip 4 and the handle portion 2121 to fix the decoration strip 4 on the handle portion 2121.

[0042] As shown in FIG. 6 and FIG. 7, the decoration strip 4 has a constant and approximately L-shaped cross section. Each decoration strip 4 includes a first plate portion 42 approximately perpendicular to the front plate and a second plate portion 43 bending inwards from a rear side of the first plate portion 42. The bonding strip 63 is disposed between the first plate portion 42 and the side plate 212.

[0043] As shown in FIG. 8 and FIG. 9, the base wall 230 of the upper end cap 23 protrudes from the handle portion 2121 in the transverse direction of the door to form a side stop portion 238 that is used for positioning the decoration strip 4 during connection of the decoration strip 4. The base wall 240 of the lower end cap 24 is shorter than the side stop portion 238. In an embodiment, a side end surface 249, which corresponds to a front portion of the handle portion 2121, of the base wall 240 of the lower end cap 24 may slightly protrude from the side plate 212; after the bonding strip 63 (not shown in FIG. 8 and FIG. 9) is adhered to the side plate 212, a step between the base wall 240 and the side plate 212 is compensated for. In an alternative embodiment, the side end surface 249 may also be approximately flush with the side plate 212, and even be closer to the inner side than the side plate 212.

[0044] An upper end surface 45 of the decoration strip 4 abuts a lower surface of the stop portion 238 to be positioned longitudinally; a lower end of the decoration strip 4 covers the side end surface 249, which corresponds to a front portion of the handle portion 2121, of the base wall 240 of the lower end cap 24; a lower end surface 46 is located at a front side of the front end surface 249 and is exposed.

[0045] The side stop portion 238 is used as a part of a horizontal base wall 230 of the upper end cap 23; compared with a main part of the base wall 230, the side stop portion 238 has a reduced wall thickness. Specifically, the wall thickness of the side stop portion 238 is smaller than that of a rear portion, which is located at a rear side of the decoration strip 4, of the base wall 230, and is also smaller than that of a central area of the base wall 230. The side end surface 249 may also have a reduced height the same as that of the side stop portion 238.

[0046] As shown in FIG. 6 and FIG. 8, a hook portion 41 bending inwards is provided at a front end of the decoration strip 4; as viewed in the transverse direction of the door, the hook portion 41 covers a connecting curved surface 213 between the front plate 212 and the side plate 211, and enters between the connecting curved

surface 213 and the decoration panel 3.

[0047] An inner surface and an outer surface of the hook portion 41 that face the door panel 21 are connected to the tail end, and a curvature radius of the inner surface is smaller than that of the outer surface. The hook portion 41 has a gradually shrinking shape.

[0048] As shown in FIG. 3 and FIG. 4, the door body 2 includes a system housing 8 used for accommodating an operation and/or display unit 7, and the system housing 8 has an accommodation space 80 used for accommodating the operation and/or display unit 7. The front plate 211 has an opening 2116 and a flange 2117, where the flange 2117 extends backwards from an edge of the opening 2116, and the system housing 8 has a connecting slot (not shown) for receiving the flange 2117. The flange 2117 is inserted into the connecting slot, so that the system housing 8 may be fixed on a rear side of the front plate 211 before the foaming procedure. The flange 2117 is disposed along left and right edges and a lower edge of the opening 2116, and an upper edge of the opening 2116 is not disposed with a flange, so that the operation and/or display unit 7 may be successfully inserted into the accommodation space 80.

[0049] The door body 2 has a channel 91 connected to the accommodation space 80. An inlet of the channel 91 is located on the upper end cap 23, and extends from the upper end cap 23 to above the accommodation space 80. The upper end cap 23 includes a hollow connecting platform 9 that is formed with the channel 91 and is connected to an end of the system housing 8.

[0050] The connecting platform 9 projects downwards more than the front connecting edge 231, and front surfaces of the connecting platform 9 and the front connecting edge 231 are located on a same plane, so that the front surface of the connecting platform 9 may also be connected to an inner surface of the front plate 211. A pair of the support ribs 236 are separately close to a corresponding side of the connecting platform 9. A second bonding apparatus 92 is disposed between the front surface of the connecting platform 9 and the front plate 211, so as to prevent a foaming liquid from leaking from between the connecting platform 9 and the front plate 211. The second bonding apparatus 92 is, for example, an adhesive tape.

[0051] The embodiments of single components that are described with reference to FIG. 1 to FIG. 9 may be combined with each other in any given manner to achieve an advantage of the present invention. In addition, the present invention is not limited to the shown embodiments, and generally other means apart from the shown means may also be used, as long as these means can also achieve a same effect.

Claims

1. A door (1) for a cooling appliance, comprising a door body (2) and at least one decoration strip (4) con-

- connected to the door body (2), wherein the door body (2) comprises a front plate (211), a door lining (22), a pair of side plates (212), an upper end cap (23), a lower end cap (24), and a thermal insulation space enclosed by the front plate (211), the door lining (22), the pair of side plates (212), the upper end cap (23), and the lower end cap (24); and the decoration strip (4) is connected to corresponding side plates (212); **characterized in that**, one of the upper end cap (23) and the lower end cap (24) comprises a stop portion (238) transversely protruding from the side plate (212), a tail end surface (45) of an end of the decoration strip (4) abuts the stop portion (238), and as viewed in a transverse direction, the other end of the decoration strip (4) covers at least a part of a side end surface (249) of the other of the upper end cap (23) and the lower end cap (24).
2. The door according to claim 1, **characterized in that**, the stop portion (238) is disposed on the upper end cap (23), and as viewed in the transverse direction, a lower end of the decoration strip (4) covers the at least a part of the side end surface (249).
 3. The door according to claim 1, **characterized in that**, the at least a part of the side end surface (249) of the other of the upper end cap (23) and the lower end cap (24) is approximately flush with the corresponding side plate (212), or protrudes from the side plate (212) by a thickness of an adhesion strip used for bonding the decoration strip (4) to the side plate (212).
 4. The door according to claim 1, **characterized by** comprising a door panel (21) made of sheet metal, the door panel (21) comprising the front plate (211) and the side plate (212), and the side plate (212) bending backwards from a longitudinal side of the front plate (211).
 5. The door according to claim 1, **characterized in that**, the side plate (212) comprises a handle portion (2121) and a side plate rear portion (2122) connected to a rear side of the handle portion (2121), and the decoration strip (4) is connected to the handle portion (2121).
 6. The door according to any one of claims 1 to 5, **characterized in that**, the stop portion (238) is a part of a base wall (230) of the upper end cap (23) or the lower end cap (24), and compared with a main part of the base wall (230), the stop portion (238) has a reduced wall thickness.
 7. The door according to any one of claims 1 to 5, comprising a decoration panel (3) adhered to a front side of the front plate (211), the decoration strip (4) being entirely located behind the decoration panel (3).
 8. The door according to claim 7, **characterized in that**, a hook portion (41) is provided at a front end of the decoration strip (4), and the hook portion (41) transversely covers a connecting curved surface (213) connecting the front plate (211) and the side plate (212) and enters between the connecting curved surface (213) and the decoration panel (3).
 9. The door according to any one of claims 1 to 5, **characterized in that**, the decoration strip (4) has a constant and approximately L-shaped cross section, and comprises a first plate portion (42) approximately perpendicular to the front plate (211) and a second plate portion (43) bending inwards from a rear side of the first plate portion (42), and a bonding strip (63) used for bonding the decoration strip (4) and the side plate (212) is disposed between the first plate portion (42) and the side plate (212).
 10. A cooling appliance, comprising the door according to any one of the foregoing claims.

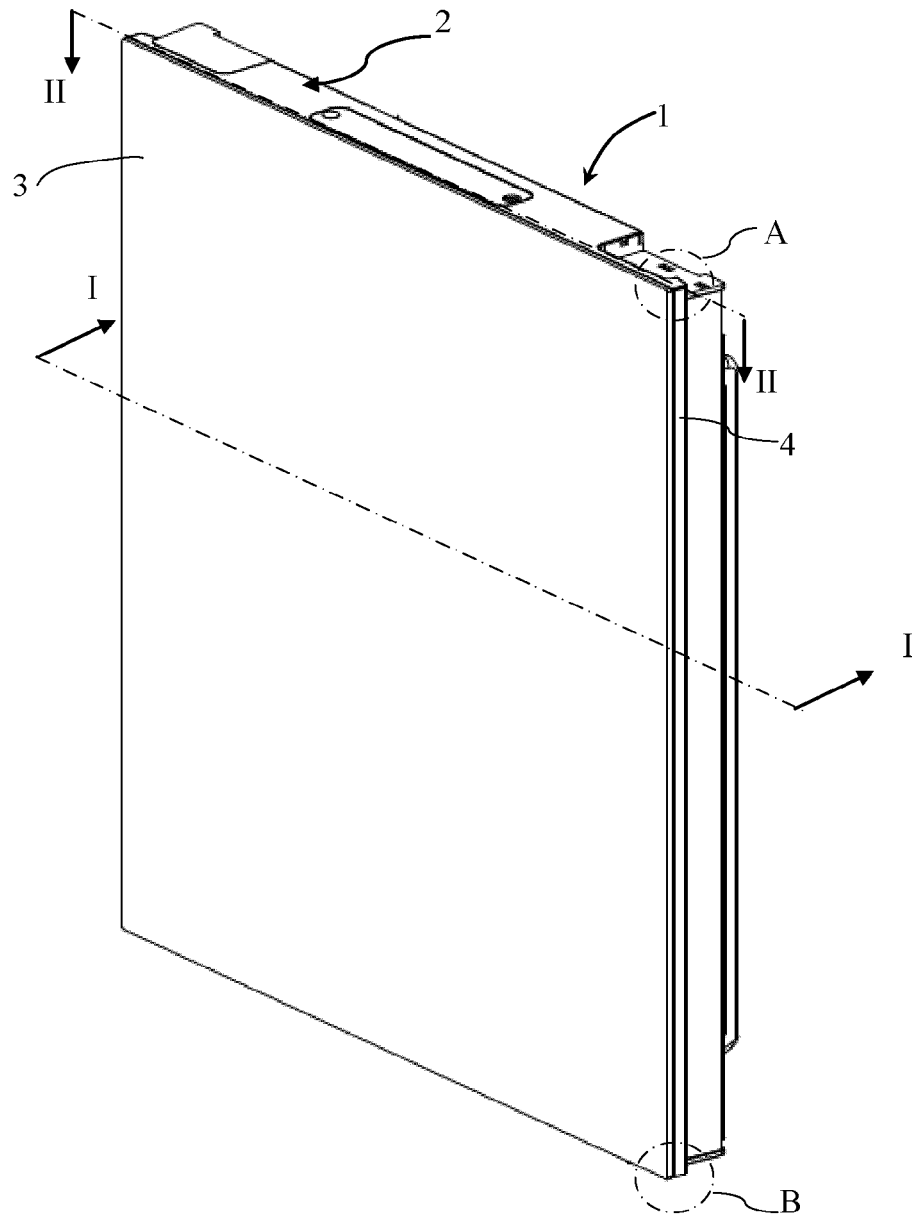


FIG. 1

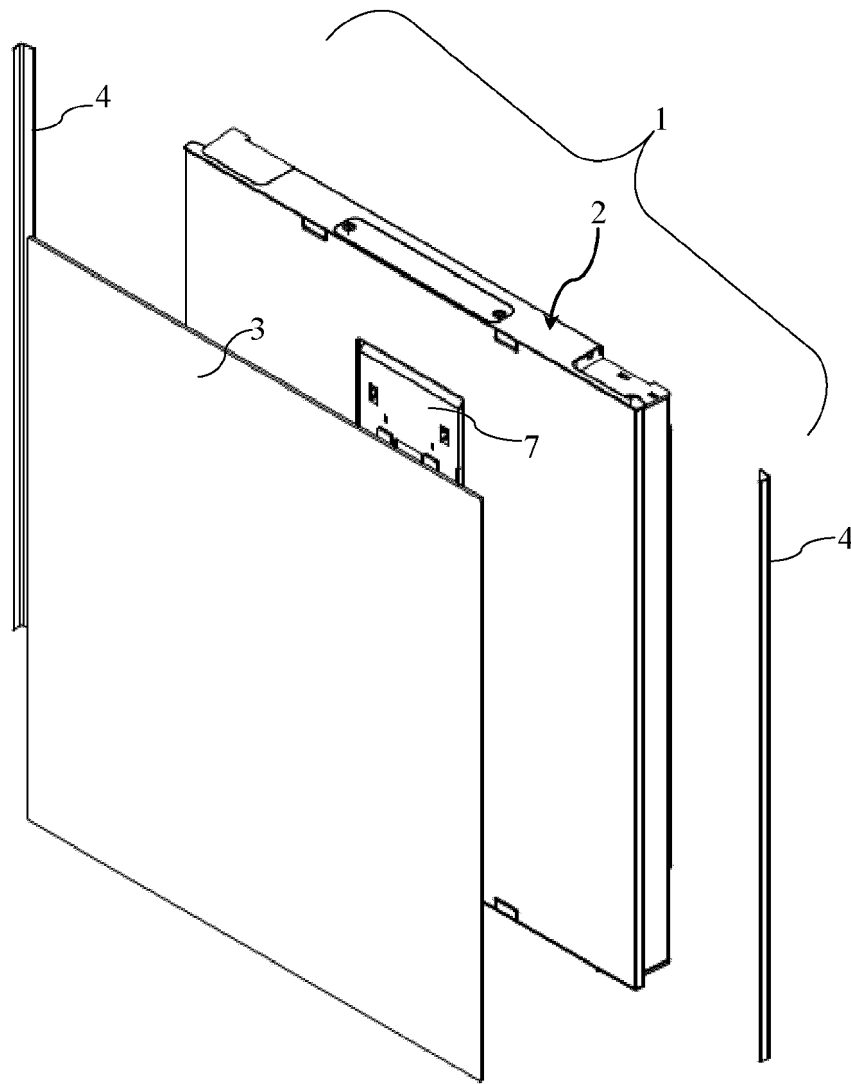


FIG. 2

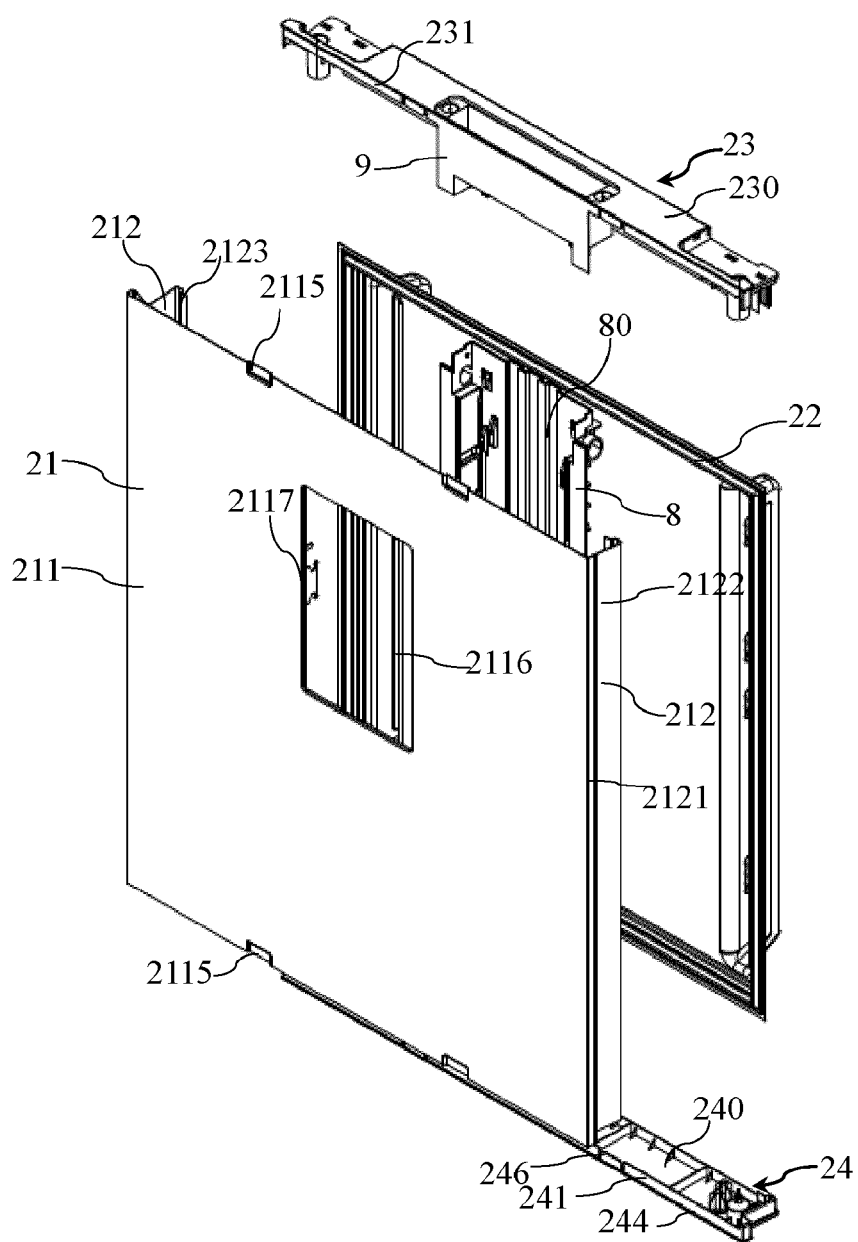


FIG. 3

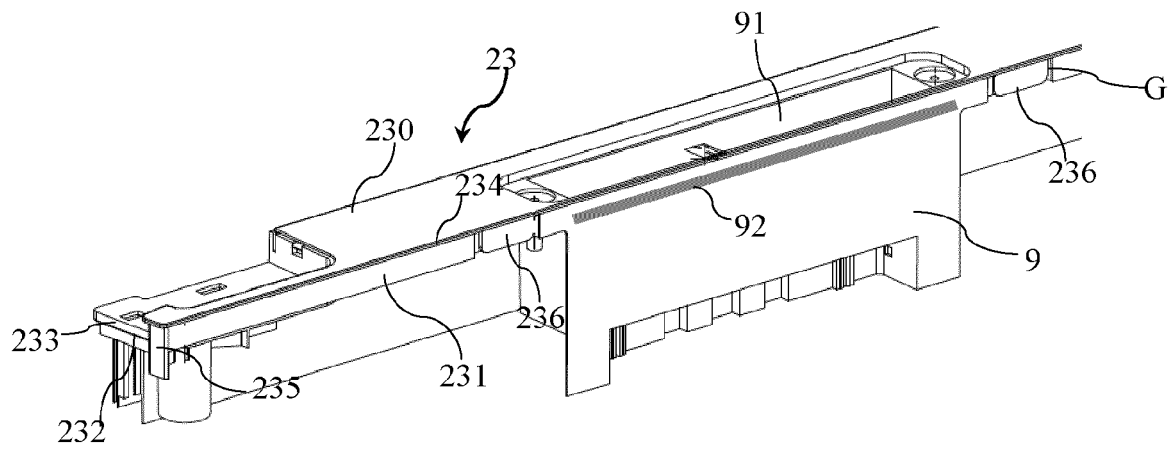


FIG. 4

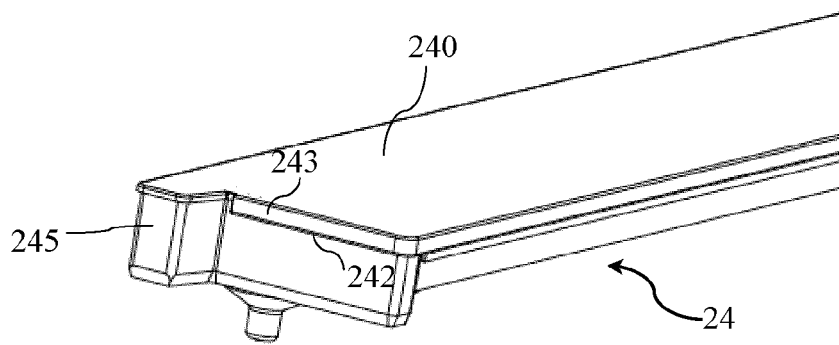


FIG. 5

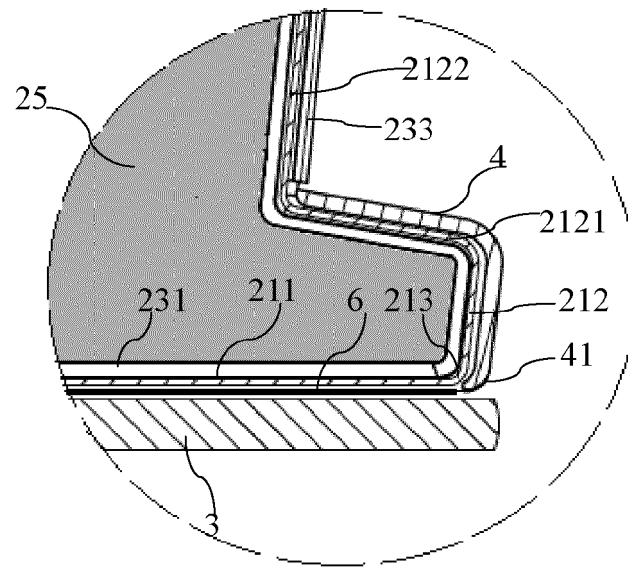


FIG. 6

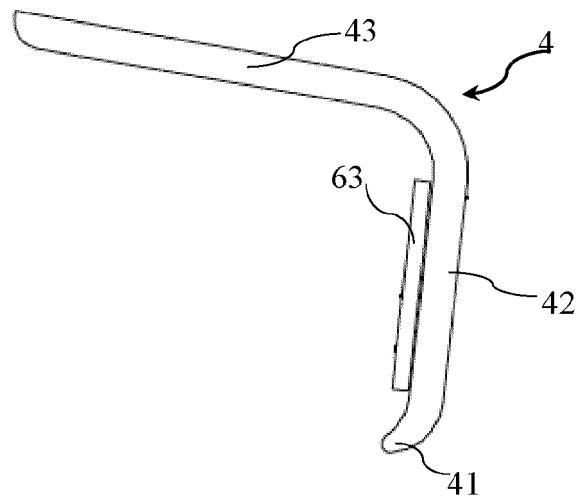


FIG. 7

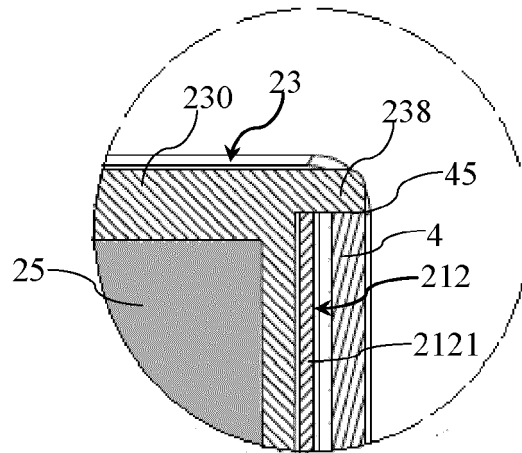


FIG. 8

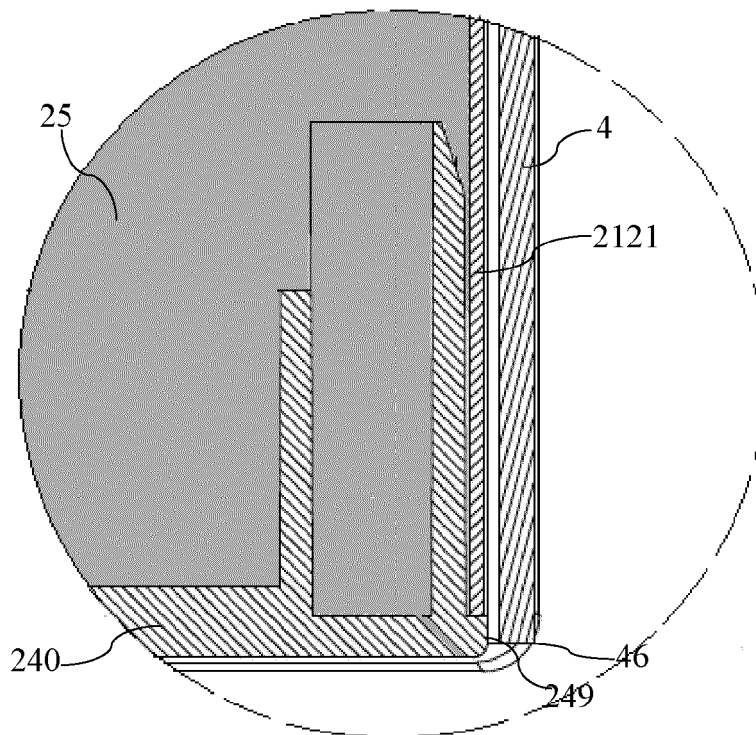


FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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