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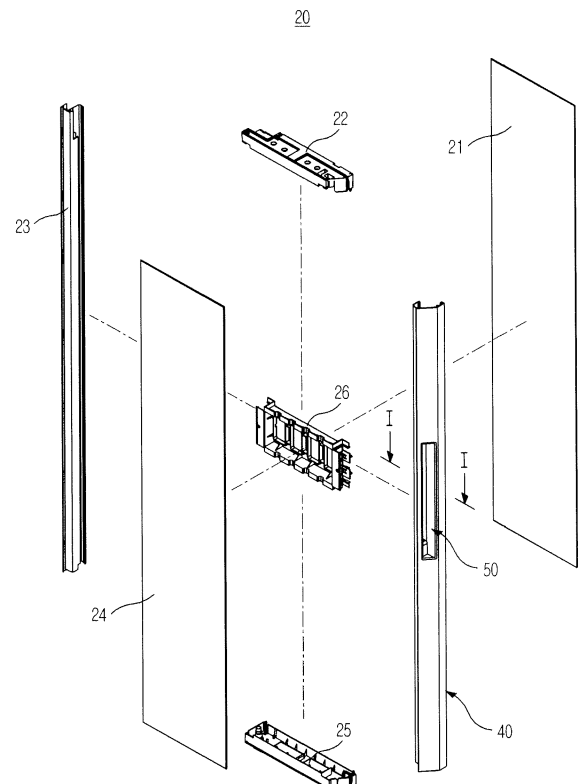
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(54) **Refrigerator and door thereof**

(57) A door handle includes a front surface part (41) and a side surface part (42) provided on an inner side chassis (40) forming one side surface of a refrigerator door (20) in the longitudinal direction, an inclined plane part (43) formed between the front surface part (41) and the side surface part (42) in the longitudinal direction, a handle part (44) formed on the inclined plane part (43) so as not to be deviated from the inclined plane part (43), and a handle member (50) provided with an opening formed in a shape corresponding to that of the handle part (44), and connected to the handle part (44).

FIG. 3A



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Description

BACKGROUND

1. Field

[0001] Embodiments relate to a refrigerator with a door handle having improved heat insulating performance and assembly efficiency.

2. Description of the Related Art

[0002] In general, a refrigerator is an apparatus which stores articles in a fresh state for a long time using cold air supplied to the insides of storage chambers. Such a refrigerator includes the storage chambers, front surfaces of which are opened so as to receive articles, and doors to open and close the storage chambers are installed at the front surfaces of the storage chambers. Here, the doors are generally hinged to a main body of the refrigerator, and are rotated to open and close the storage chambers. Further, door handles allowing a user to easily open and close the doors are provided on outer surfaces of the doors.

[0003] Door handles are divided into a protruded type in which a door handle is connected to a refrigerator door in a protruded shape, and a hidden type in which a recess serving as a door handle is formed on a refrigerator door. The hidden type door handle improves user convenience, space efficiency, and an external appearance of a refrigerator, compared with the protruded type door handle.

[0004] However, in the conventional hidden type door handle, the recess extended in the longitudinal direction is formed on a side surface of the refrigerator door and thus heat insulating performance is lowered, and the inner side surface of the refrigerator door is formed in a complicated shape and assembly efficiency of the door is lowered.

[0005] Therefore, it is an aspect to provide a door handle which is formed on an inner side surface of a refrigerator door to improve heat insulating performance and assembly efficiency, and a refrigerator having the door handle.

[0006] Additional aspects will be set forth in part in the description which follows and, in part, will be apparent from the description, or may be learned by practice of the invention.

[0007] In accordance with one aspect, a door handle of a refrigerator includes a front surface part and a side surface part provided on an inner side chassis forming one side surface of a refrigerator door in the longitudinal direction, an inclined plane part formed between the front surface part and the side surface part in the longitudinal direction, a handle part formed on the inclined plane part so as not to be deviated from the inclined plane part, and a handle member provided with an opening formed in a shape corresponding to that of the handle part, and con-

nected to the handle part.

[0008] The inclined plane part may be extended from one end to the other end of the inner side chassis in the longitudinal direction.

5 **[0009]** The opening may not be protruded upwardly from the inclined plane part.

[0010] The handle part may include the longitudinal central portion of the inner side chassis, and be formed in longitudinal direction.

10 **[0011]** The door handle may further include a fixing plate disposed on the rear surface of the inclined plane part to closely fix the handle member to the handle part.

[0012] In accordance with another aspect, a door of a refrigerator includes a door plate provided with a front surface part and a side surface part of the door, an inclined plane part formed between the front surface part and the side surface part in the longitudinal direction, and a handle part formed on the inclined plane part so as not to be deviated from the inclined plane part.

15 **[0013]** The handle part may be formed by depressing the inclined plane part toward the inside of the door to a designated depth.

[0014] The door may further include a handle member provided with an opening formed in a shape corresponding to that of the handle part, and connected to the handle part.

20 **[0015]** The opening may not be protruded upwardly from the inclined plane part.

[0016] The door may further include a fixing plate disposed on the rear surface of the inclined plane part to closely fix the handle member to the handle part.

[0017] The door may further include a case bridge disposed within the door.

25 **[0018]** In accordance with a further aspect, a refrigerator includes a main body, a first door and a second door hinged to the main body and horizontally spaced from each other at a designated interval such that inner side parts thereof are opposite to each other, a first inclined plane part formed between a front surface part and the inner side surface part of the first door in the longitudinal direction, a second inclined plane part formed between a front surface part and the inner side surface part of the second door in the longitudinal direction, a first handle part formed on the first inclined plane part, and a second handle part formed on the second inclined plane part.

[0019] The first handle part and the second handle part may be formed in a corresponding shape and located so as to be symmetrical to each other.

[0020] The refrigerator may further include a home bar door formed on the first door, and the first handle part may be formed to have a length corresponding to that of the home bar door and be located at a height corresponding to that of the home bar door.

30 **[0021]** The refrigerator may further include a handle member provided with an opening formed in a shape corresponding to that of the first handle part, and connected to the first handle part.

[0022] The handle member may be connected to the

first handle part without a height difference.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] These and/or other aspects of the invention will become apparent and more readily appreciated from the following description of the embodiments, taken in conjunction with the accompanying drawings of which:

FIG. 1 is a perspective view illustrating an overall configuration of a refrigerator in accordance with one embodiment;

FIG. 2 is a perspective view of a configuration of a door of the refrigerator in accordance with the embodiment;

FIG. 3A is an exploded perspective view of the door of the refrigerator in accordance with the embodiment;

FIG. 3B is a perspective view illustrating a door plate in accordance with another embodiment;

FIG. 4 is an exploded perspective view of a door handle of a refrigerator in accordance with one embodiment; and

FIG. 5 is a sectional view of the door handle of the refrigerator, taken along the line I-I of FIG. 3A.

DETAILED DESCRIPTION

[0024] Reference will now be made in detail to the embodiments, examples of which are illustrated in the accompanying drawings, wherein like reference numerals refer to like elements throughout.

[0025] FIG. 1 is a perspective view illustrating an overall configuration of a refrigerator in accordance with one embodiment.

[0026] As shown in FIG. 1, the refrigerator in accordance with this embodiment includes a main body 10, the front surface of which is opened, horizontally divided into a first storage chamber 11 and a second storage chamber 12 to store food, a first door 20 hinged to the main body 10 to open and close the first storage chamber 11, and a second door 30 hinged to the main body 10 to open and close the second storage chamber 12. A home bar door 31 is mounted on at least one of the first door 20 and the second door 30.

[0027] Here, the first door 20 and the second door 30 are horizontally disposed at a designated interval. Such an interval is provided so as to prevent the first door 20 and the second door 30 from interfering with each other's movements when the first door 20 and the second door 30 are opened simultaneously.

[0028] Hereinafter, an internal structure of the door 20 or 30 will be described. Here, the internal structure of

only the first door 20 will be described, and the internal structure of the second door 30 is the same as that of the first door 20 and thus a detailed description thereof will be omitted.

[0029] FIG. 2 is a perspective view of a configuration of a door of the refrigerator in accordance with the embodiment of the present invention, FIG. 3A is an exploded perspective view of the door of the refrigerator in accordance with the embodiment, and FIG. 3B is a perspective view illustrating a door plate in accordance with another embodiment.

[0030] As shown in FIGS. 2 to 3B, the door 20 is formed by assembling a rear panel 21, a front panel 24, an upper cap 22, a lower cap 25, an outer side chassis 23, and an inner side chassis 40. The front panel 24 may be made of tempered glass.

[0031] The outer side chassis 23 is connected to one side surface of the rear panel 21 in the forward direction, and the inner side chassis 40 is connected to the other side surface of the rear panel 21 in the forward direction. Then, the front panel 24 is connected to the outer side chassis 23 and the inner side chassis 40, and the upper cap 22 and the lower cap 25 corresponding to upper and lower lids are respectively connected to upper and lower portions of the rear panel 21, the outer side chassis 23, the inner side chassis 40, and the front panel 24. Here, a hinge structure for connection with the main body 10 is disposed around the outer side chassis 23, and the door 20 is rotated about the outer side chassis 23 and thus is opened and closed. The respective parts forming the door 20 are separately manufactured and then are assembled, thereby improving productivity of the door 20.

[0032] Further, as shown in FIG. 3B, the front panel 24 and the inner side chassis 40 are not separately formed, but may be formed integrally. In this case, a door plate 80 forming the front surface and the inner side surface of the door 20 is integrally manufactured by bending steel or through injection molding. The door plate 80 includes a front surface part 81, a side surface part 82, and an inclined plane part 83, and a handle part 84 is formed on the inclined plane part 83. A description of the door plate 80 will be substituted by a description of the inner side chassis 40, which will be given later.

[0033] The inside of the door 20 is filled with a heat insulating material (not shown) so as to insulate the inside of the storage chamber 11 from heat at the outside of the door 20.

[0034] A case bridge 26 to prevent deformation of the door 20 is installed in the door 20. One end of the case bridge 26 is connected to the outer side chassis 23, and the other end of the case bridge 26 is connected to the inner side chassis 40, thereby reinforcing rigidity of the door 20.

[0035] Hereinafter, an internal structure of a door handle of the refrigerator will be described.

[0036] FIG. 4 is an exploded perspective view of a door handle of a refrigerator in accordance with one embodiment, and FIG. 5 is a sectional view of the door handle

of the refrigerator, taken along the line I-I of FIG. 3A.

[0037] As shown in FIGS. 4 and 5, the inner side chassis 40 includes a front surface part 41 and a side surface part 42 disposed on the front surface of the door 20. The front surface part 41 and the side surface part 42 are extended from one longitudinal end to the other longitudinal end of the inner side chassis 40.

[0038] The inclined plane part 43 is formed between the front surface part 41 and the side surface part 42 in the longitudinal direction. Therefore, a user may recognize the inclined plane part 43 from the front surface of the refrigerator. Although the inclined plane part 43 may be formed on a part of the inner side chassis 40 in the longitudinal direction, the inclined plane part 43 in this embodiment is extended from one end to the other end of the inner side chassis 40 in the same manner as the front surface part 41 and the side surface part 42. Here, the inclined plane part 43 is connected to the front surface part 41 and the side surface part 42 at designated angles, respectively.

[0039] The inner side chassis 40 is connected with one side surface of the front panel 24, and thus supports the front panel 24. For this purpose, a connection groove 46 is formed between the front surface part 41 and the inclined plane part 43. The connection groove 46 is extended from one end to the other end of the inner side chassis 40, and one overall side surface of the front panel 24 is connected with the inner side chassis 40 through the connection groove 46. The side surface of the front panel 24 is connected with the connection groove 46 in an interference fit manner, and thus no separate fixing device is required.

[0040] A handle part 44 to rotate the door 20 so as to open the door 20 is formed on the inclined plane part 43. The handle part 44 is formed by cutting the inclined plane part 43 into a designated shape or by depressing the inclined plane part 43 to a designated depth toward the inside of the door 20. If the handle part 44 is formed by the latter method, the inside of the door 20 may be hermetically sealed from the outside of the door 20 without connection with a handle member 50, which will be described later.

[0041] The handle part 44 may be formed so as not to be deviated from the inclined plane part 43. That is, the maximum width of the handle part 44 is smaller than the width of the inclined plane part 43. Since the handle part 44 is located on the inclined plane part 43, a user recognizes the handle part 44 from the front surface of the refrigerator. That is, since the handle part 44 is exposed to the front surface of the refrigerator, the user may more intuitively recognize an opening and closing method of the door 20.

[0042] The handle part 44 is formed on the inclined plane part 43 in the longitudinal direction, and is located at the longitudinal central portion of the door 20 so as to allow the user to easily open and close the door 20. That is, the handle part 44 is disposed so as to include the longitudinal central portion of the door 20. Further, the

length of the handle part 44 has a designated value or more in consideration of convenience in operation of the door 20 by the user. Moreover, the handle part 44 may be formed in a rectangular shape in consideration of the external appearance of the refrigerator.

[0043] When a home bar (not shown) is installed on the door 30, the home bar door 31 is mounted on the front surface of the door 30. In consideration of the external appearance of the refrigerator, the handle part 44 may have a length corresponding to that of the home bar door 31 and be located at a height corresponding to that of the home bar door 31.

[0044] The handle part 44 is formed on each of the first door 20 and the second door 30. In consideration of the external appearance of the refrigerator, the two handle parts 44 formed on the first door 20 and the second door 30 may have the same shape and be located at positions symmetrical to each other with respect to a gap between the first door 20 and the second door 30.

[0045] The handle member 50 is connected to the handle part 44. An opening 51 corresponding to the shape of the handle part 44 is formed on the handle member 50. Here, the handle member 50 is inserted into the handle part 44 by more than a designated depth such that a user pulls the handle member 50 through the opening 51 to open the first door 20 or the second door 30. If the handle part 44 is formed by cutting the inclined plane part 43 into a designated shape, the inside of the door 20 may be hermetically sealed from the outside of the door 20 by connecting the handle member 50 to the handle part 44.

[0046] The opening 51 has the same shape as that of the handle part 44 so as to allow the handle member 50 to be closely connected to the handle part 44.

[0047] When the handle member 50 is connected to the handle part 44, the opening 51 does not protrude upwardly from the inclined plane part 43. That is, the handle member 50 is connected to the handle part 44 without a height difference between the opening 51 and the inclined plane part 43. A protrusion 52 is formed along the edge of the opening 51 of the handle member 50, and a receipt groove 45 corresponding to the shape of the protrusion 52 is formed along the edge of the handle part 44. The handle member 50 may be stably connected to the handle part 44 by seating the protrusion 52 on the receipt groove 45.

[0048] Further, a fixing plate 60 is provided to closely connect the handle member 50 to the handle part 44 and to maintain the connection state thereof. The fixing plate 60 is connected with the inner side chassis 40 in the inside of the door 20 or 30 and connected to the handle member 50 simultaneously, thereby fixing the handle member 50 to the handle part 44. Here, at least one through hole 61 is formed through the fixing plate 60, and a screw hole 53 is provided on the handle member 50 at a position corresponding to the through hole 61. At least one screw 70 is fastened to the screw hole 53 via the through hole 61.

[0049] As is apparent from the above description, a door handle in accordance with one embodiment reduces a surface area occupied thereby, compared with a conventional hidden type door handle, thereby minimizing deterioration of heat insulating performance. Further, the door handle may be easily seen from the front surface of a refrigerator, thereby increasing convenience in use.

[0050] Further, the door handle in accordance with the embodiment allows an inner side chassis of a refrigerator door to have a simple shape, thereby improving assembly efficiency of the refrigerator door. Moreover, the handle door is not protruded to the outside of the refrigerator, thereby improving an external design of the refrigerator as well as preventing damage to the door handle caused by external impact.

[0051] Although a few embodiments have been shown and described, it would be appreciated by those skilled in the art that changes may be made in these embodiments without departing from the principles and spirit of the invention, the scope of which is defined in the claims and their equivalents.

Claims

1. A door handle of a refrigerator comprising:

a front surface part and a side surface part provided on an inner side chassis forming one side surface of a refrigerator door in the longitudinal direction;

an inclined plane part formed between the front surface part and the side surface part in the longitudinal direction;

a handle part formed on the inclined plane part so as not to be deviated from the inclined plane part; and

a handle member provided with an opening formed in a shape corresponding to that of the handle part, and connected to the handle part.

2. The door handle according to claim 1, wherein the inclined plane part is extended from one end to the other end of the inner side chassis in the longitudinal direction.

3. The door handle according to claim 1, wherein the opening is not protruded upwardly from the inclined plane part.

4. The door handle according to claim 1, wherein the handle part includes the longitudinal central portion of the inner side chassis, and is formed in longitudinal direction.

5. The door handle according to claim 1, further comprising a fixing plate disposed on the rear surface of the inclined plane part to closely fix the handle mem-

ber to the handle part.

6. A door of a refrigerator comprising:

5 a door plate provided with a front surface part and a side surface part of the door;

an inclined plane part formed between the front surface part and the side surface part in the longitudinal direction; and

10 a handle part formed on the inclined plane part so as not to be deviated from the inclined plane part.

7. The door according to claim 6, wherein the handle part is formed by depressing the inclined plane part toward the inside of the door to a designated depth.

8. The door according to claim 6, further comprising a handle member provided with an opening formed in a shape corresponding to that of the handle part, and connected to the handle part.

9. The door according to claim 8, wherein the opening is not protruded upwardly from the inclined plane part.

10. The door according to claim 8, further comprising a fixing plate disposed on the rear surface of the inclined plane part to closely fix the handle member to the handle part.

11. A refrigerator comprising:

a main body;

a first door and a second door hinged to the main body and horizontally spaced from each other at a designated interval such that inner side parts thereof are opposite to each other;

a first inclined plane part formed between a front surface part and the inner side surface part of the first door in the longitudinal direction;

a second inclined plane part formed between a front surface part and the inner side surface part of the second door in the longitudinal direction;

a first handle part formed on the first inclined plane part; and

a second handle part formed on the second inclined plane part.

12. The refrigerator according to claim 11, wherein the first handle part and the second handle part are formed in a corresponding shape and located so as to be symmetrical to each other.

13. The refrigerator according to claim 11, further comprising a home bar door formed on the first door, wherein the first handle part is formed to have a length corresponding to that of the home bar door

and is located at a height corresponding to that of the home bar door.

14. The refrigerator according to claim 11, further comprising a handle member provided with an opening 5
formed in a shape corresponding to that of the first handle part, and connected to the first handle part.
15. The refrigerator according to claim 14, wherein the handle member is connected to the first handle part 10
without a height difference.

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FIG. 1

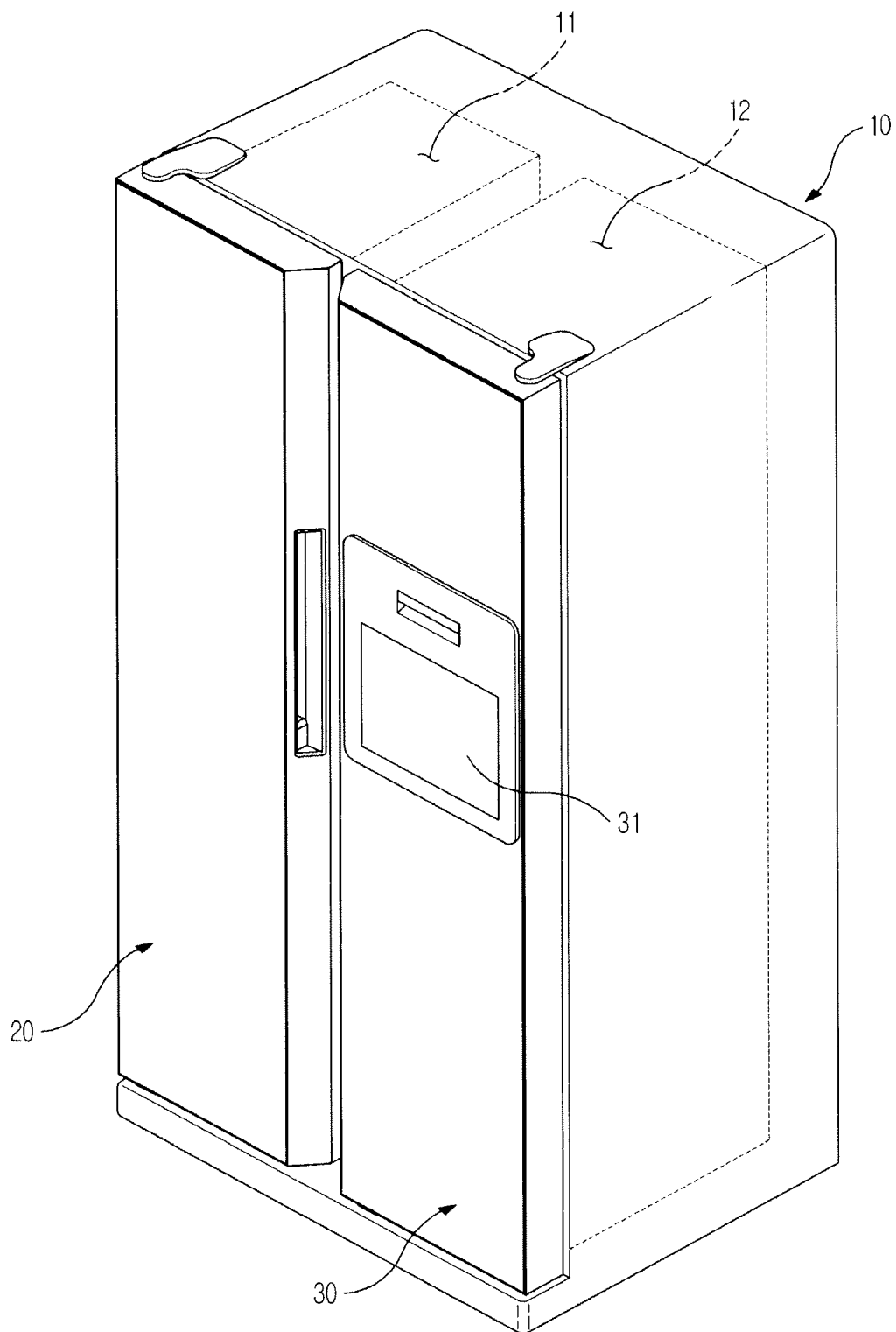


FIG. 2

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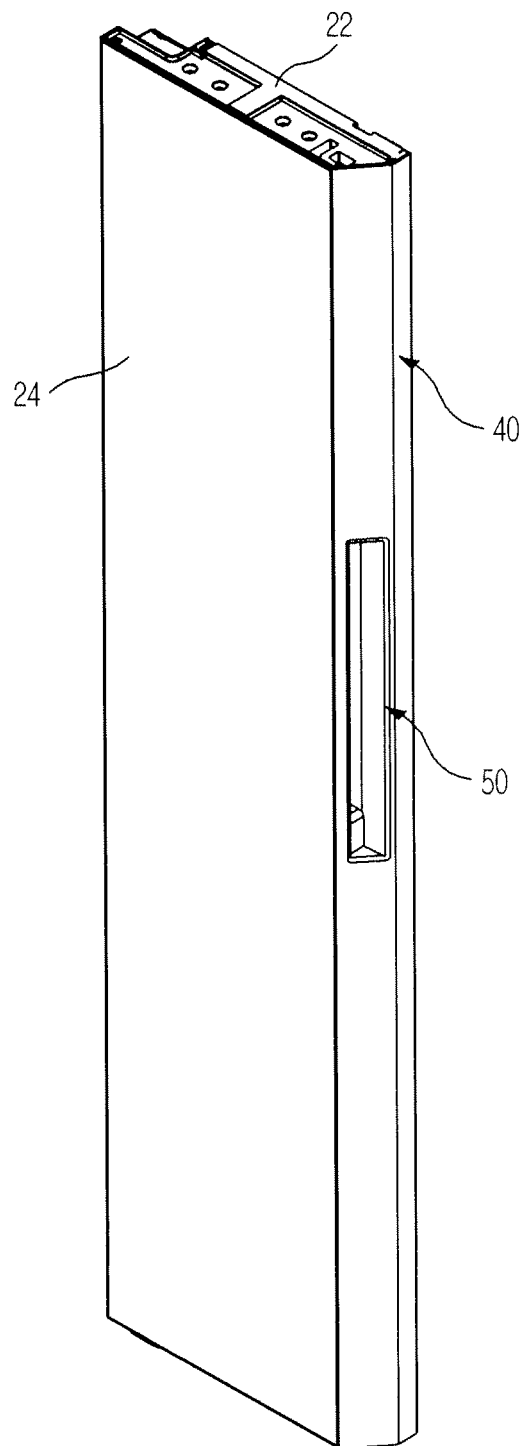


FIG. 3A

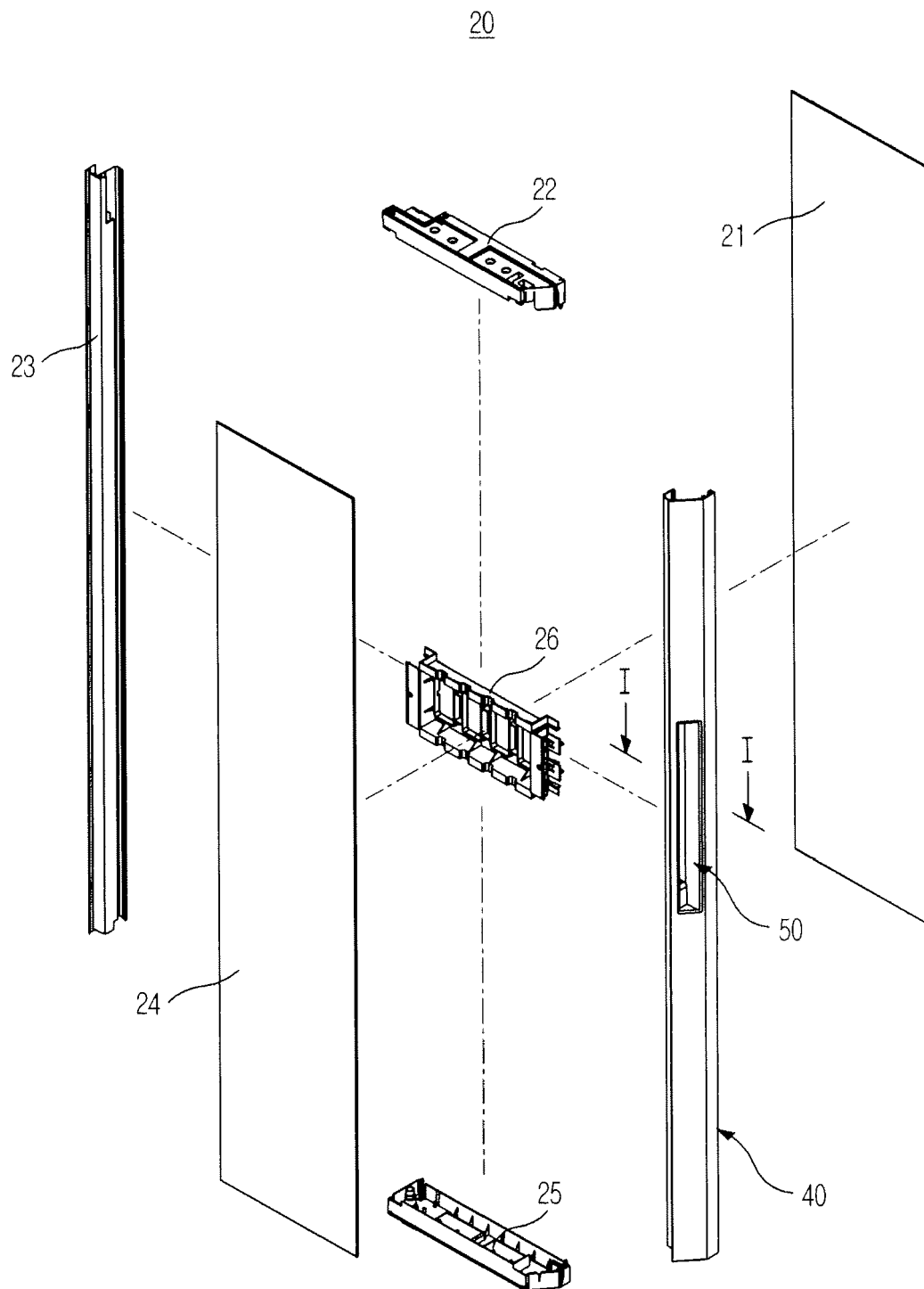


FIG. 3B

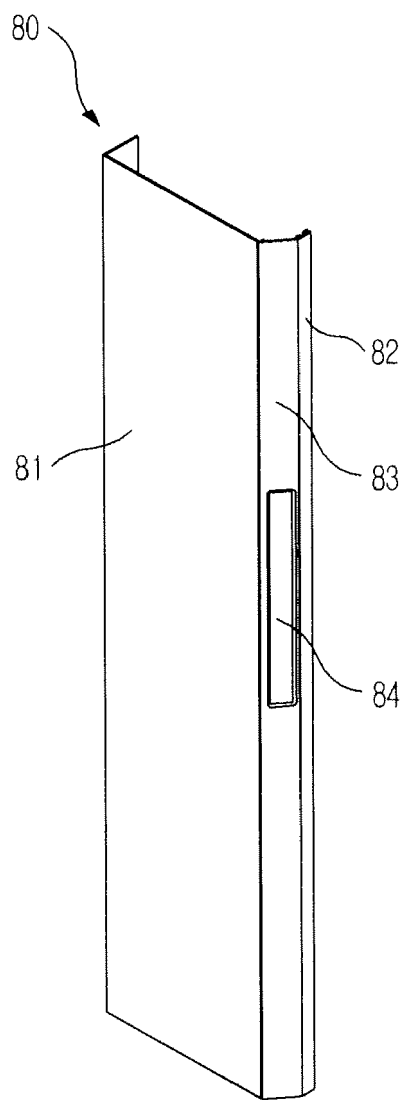


FIG. 4

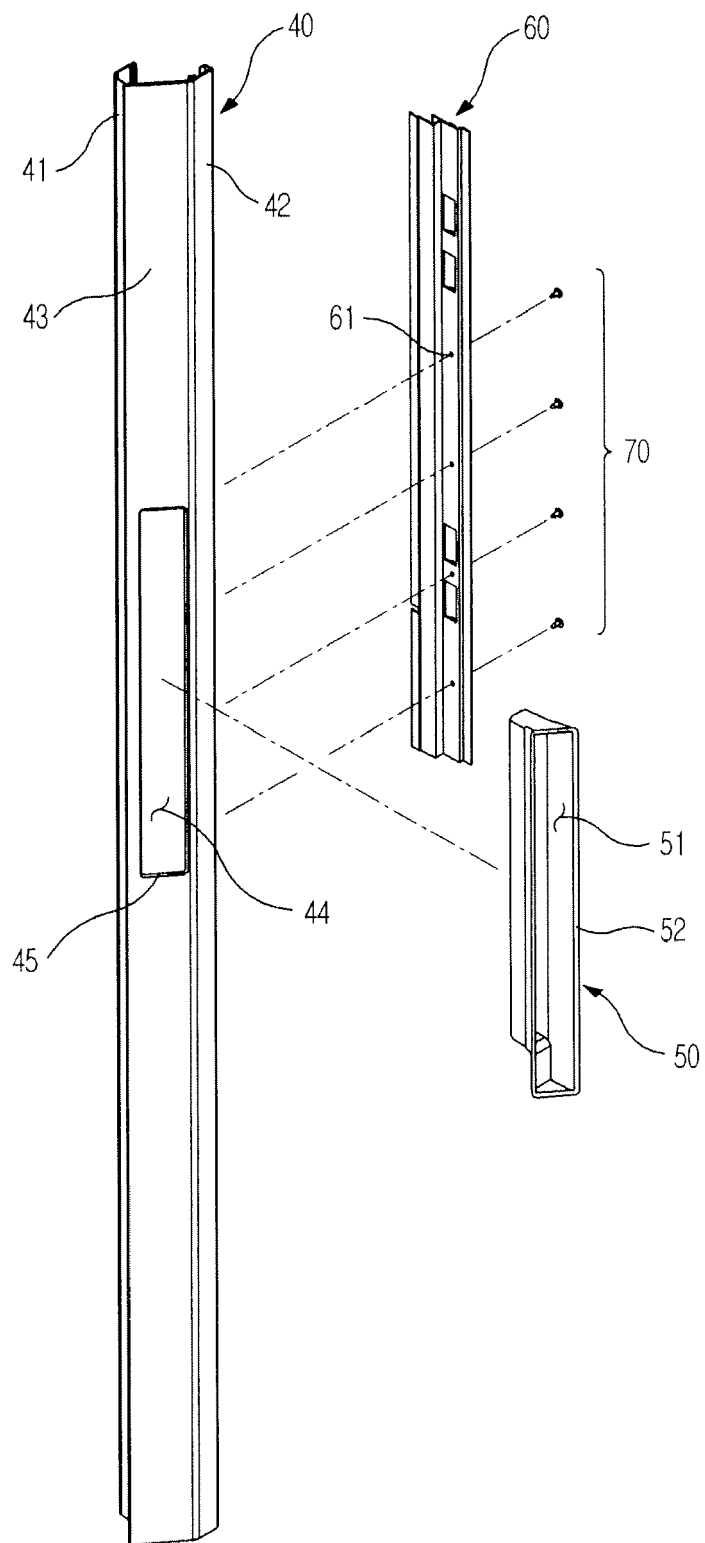


FIG. 5

