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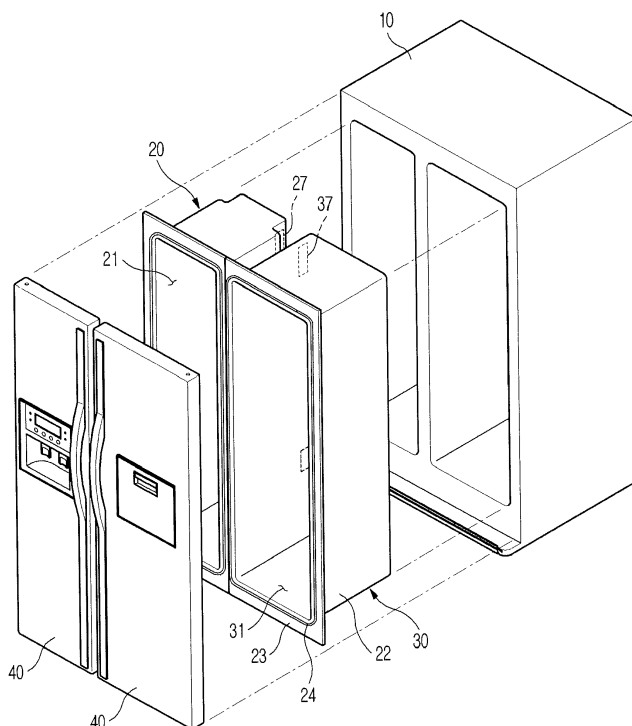
Refrigerator

(57)

A refrigerator including a first inner case (20) defining a freezing compartment (21) and a second inner case (30) defining a refrigerating compartment (31). The first inner case (20) and the second inner case (30) are formed with rupture portions (27,37) upon injection mold-

ing of the first and second inner cases. The rupture portions (27,37) may be cut away to communicate the first inner case (20) and the second inner case (30) with each other, enabling use of the inner cases having a common configuration.

FIG. 1



Description

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of Korean Patent Application No. 2009-0093133, filed on September 30, 2009 in the Korean Intellectual Property Office, the disclosure of which is incorporated herein by reference.

BACKGROUND

1. Field

[0002] Embodiments relate to an inner case of a refrigerator defining a storage compartment therein.

2. Description of the Related Art

[0003] Generally, refrigerators are devised to keep food fresh at a low temperature by supplying low-temperature cold air into a storage compartment in which the food is stored. A refrigerator includes a refrigerating compartment to keep food at a temperature slightly above freezing, and a freezing compartment to keep food at a freezing temperature or less.

[0004] Refrigerators may be classified into single cooler type refrigerators, and dual cooler type refrigerators. In a single cooler type refrigerator, a single cooler is mounted in a freezing compartment, so that temperatures of the freezing compartment and a refrigerating compartment are controlled as cold air in the freezing compartment is introduced into the refrigerating compartment. In a dual cooler type refrigerator, coolers are mounted individually in a freezing compartment and a refrigerating compartment, so that temperatures of the freezing compartment and the refrigerating compartment are controlled independently.

[0005] According to whether a refrigerator is the single cooler type or dual cooler type, a refrigerator body may be configured such that a freezing compartment and a refrigerating compartment thereof are defined by respective inner cases, and these inner cases have been conventionally fabricated using separate molds.

SUMMARY

[0006] Therefore, it is an aspect to provide a refrigerator having an inner case having a common configuration regardless of whether the refrigerator is of single cooler type or dual cooler type.

[0007] Additional aspects of the invention 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.

[0008] In accordance with one aspect, a refrigerator includes a first inner case to define a freezing compartment, and a second inner case to define a refrigerating

compartment, wherein the first inner case and the second inner case are formed via injection molding and are provided respectively with rupture portions, the rupture portions being cut away to communicate the first and second inner cases with each other.

[0009] The first inner case may include a seating portion indented from a rear surface thereof, so that a first cooler to cool the freezing compartment is installed in the seating portion.

[0010] The second inner case may include a guide arranged in a lower region thereof, so that a second cooler to cool the refrigerating compartment is installed to the guide.

[0011] The guide may be integrally formed with the second inner case.

[0012] The rupture portions of the first inner case may be located at upper and lower locations of a sidewall of the seating portion.

[0013] The rupture portions of the second inner case may be located at a sidewall of the second inner case at positions corresponding to the rupture portions of the first inner case.

[0014] The guide may include a pair of ribs protruding from opposite sides of a rear surface of the second inner case.

[0015] The first and second inner cases may communicate with each other as the rupture portions are cut away, and the first inner case may be provided with a first cooler to adjust temperatures of the freezing compartment and the refrigerating compartment.

[0016] The refrigerator may further include first and second coolers provided respectively in the first and second inner cases to adjust temperatures of the freezing compartment and the refrigerating compartment, wherein the rupture portions are kept without cutting away.

[0017] In accordance with another aspect, a refrigerator includes first and second inner cases to define separate storage compartments, an outer case coupled to the first and second inner cases to enclose the first and second inner cases and defining an outer appearance of the refrigerator, and a door to open or close the storage compartments, wherein the first and second inner cases are provided with rupture portions, the rupture portions being cut away to communicate the first and second inner cases with each other when the storage compartments are cooled using a single cooler, but being kept without cutting away when the separate storage compartments are cooled respectively using separate coolers.

[0018] The rupture portions may be formed upon injection molding of the first and second inner cases.

[0019] The rupture portions may be cut away to communicate the first and second inner cases with each other, and the first inner case may be provided with a first cooler to cool the separate storage compartments.

[0020] The refrigerator may further include a freezing-compartment cold-air duct having a cold air discharge hole through which cold air generated from the first cooler is discharged, the freezing-compartment cold-air duct

being configured to cover the first cooler.

[0021] The rupture portions may be kept without cutting away, and first and second coolers may be provided to cool the separate storage compartments respectively.

[0022] The refrigerator may further include a freezing-compartment cold-air duct to cover the first cooler provided in the first inner case, and a refrigerating-compartment cold-air duct to cover the second cooler provided in the second inner case.

BRIEF DESCRIPTION OF THE DRAWINGS

[0023] These and/or other aspects 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 an exploded perspective view illustrating a schematic configuration of a refrigerator according to an embodiment;

FIG. 2 is a perspective view illustrating a first inner case defining a freezing compartment of the refrigerator according to the embodiment;

FIG. 3 is a perspective view illustrating a second inner case defining a refrigerating compartment of the refrigerator according to the embodiment;

FIG. 4 is a sectional view illustrating the interior of a refrigerator using a single cooler according to an embodiment; and

FIG. 5 is a sectional view illustrating the interior of a refrigerator using two coolers according to an embodiment.

DETAILED DESCRIPTION

[0024] Reference will now be made in detail to a refrigerator according 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 an exploded perspective view illustrating a schematic configuration of a refrigerator according to an embodiment, FIG. 2 is a perspective view illustrating a first inner case defining a freezing compartment of the refrigerator according to the embodiment, and FIG. 3 is a perspective view illustrating a second inner case defining a refrigerating compartment of the refrigerator according to the embodiment.

[0026] As shown in FIG. 1, the refrigerator according to the embodiment includes an outer case 10, inner cases 20 and 30, and a pair of doors 40. The outer case 10 contains a pair of separate accommodation spaces with an intermediate partition interposed therebetween. The inner cases 20 and 30 are configured to be inserted into the respective accommodation spaces of the outer case 10 and are spaced apart from each other by a predetermined distance. The pair of doors 40 serves to open or close storage compartments 21 and 31 respectively. The

storage compartments 21 and 31 may include a freezing compartment 21 and a refrigerating compartment 31.

[0027] The outer case 10 defines an outer experience of the refrigerator, and may be formed by bending a metal panel. The outer case 10 may take the form of a box having an open front surface.

[0028] The inner cases 20 and 30 may include a first inner case 20 and a second inner case 30, each of which is injection molded using a synthetic resin, such as plastic. The first case 20 defines an inner wall of the freezing compartment 21 and the second case 30 defines an inner wall of the refrigerating compartment 31.

[0029] An insulating wall may be provided between the outer case 10 and the inner cases 20 and 30 via injection molding of urethane liquid foam. In addition, an intermediate partition may be formed between the first inner case 20 and the second inner case 30, which are arranged parallel to each other, via injection molding of urethane liquid foam.

[0030] The first inner case 20 and the second inner case 30 may be integrally or separately formed via injection molding.

[0031] Each of the first and second inner cases 20 and 30 may include a box-shaped inner case body 22 having a front opening and a flange 24 protruding outward from a rim of the front opening of the inner case body 22.

[0032] The inner case body 22 may define the inner wall of each storage compartment 21 or 31 of the refrigerator, and the flange 24 may come into contact with a front rim of the outer case 10.

[0033] The flange 24 may be formed, along a rim of the inner case body 22, with a hot pipe installation groove 25. The installation groove 25 is indented rearward from a surface of the flange 24, so that a hot pipe (not shown) to prevent generation of dew at the flange 24 is fitted into the installation groove 25.

[0034] The doors 40 may be rotatably coupled to one side of the outer case 10 to open or close the freezing compartment 21 and the refrigerating compartment 31 defined by the first inner case 20 and the second inner case 30 respectively.

[0035] Although the first inner case 20 and the second inner case 30 may be separately injection molded according to a method to control temperatures of the storage compartments 21 and 31, i.e. according to whether the refrigerator uses a single cooler or two coolers to adjust temperatures of the storage compartments 21 and 31, in the present embodiment, the inner cases 20 and 30 may have a common configuration regardless of the number of coolers used to cool the storage compartments 21 and 31.

[0036] Specifically, if the freezing compartment 21 and the refrigerating compartment 31 are cooled by use of a single cooler, the first and second inner cases 20 and 30 may have configurations for circulation of cold air. If the freezing compartment 21 and the refrigerating compartment 31 are cooled by use of two coolers, the first and second inner cases 20 and 30 may have independent

spaces.

[0037] For this, at the stage of injection molding of the first and second inner cases 20 and 30, the first and second inner cases 20 and 30 may be provided with rupture portions 27 and 37 that are adapted to be cut away so as to communicate the first and second inner cases 20 and 30 with each other.

[0038] The rupture portions 27 and 37 include first rupture portions 27 formed at the first inner case 20 and second rupture portions 37 formed at the second inner case 30.

[0039] The rupture portions 27 and 37 may be defined by tear lines, to assure easy punching during the injection molding of the inner cases 20 and 30.

[0040] Referring to FIG. 2, the first inner case 20 defining the freezing compartment 21 may be formed with a seating portion 23 indented outward from a rear surface thereof, to assure easy installation of a first cooler 71 (see FIG. 4) and a cold air duct 50 (see FIG. 4), the first cooler 71 and the cold air duct 50 being provided to cool the freezing compartment 21. The first rupture portions 27 may be formed at a sidewall of the seating portion 23 and may be cut away via punching.

[0041] The first rupture portions 27 are provided at upper and lower locations of the sidewall of the seating portion 23 of the first inner case 20, and function as cold air circulating holes to circulate interior cold air of the freezing compartment 21 and the refrigerating compartment 31 when they are cut away from the inner case 20.

[0042] More specifically, an upper one of the first rupture portions 27 may function as a cold air supply hole to supply interior cold air of the freezing compartment 21 into the refrigerating compartment 31 when it is cut away, and a lower one of the first rupture portions 27 may function as a cold air recovery hole to return the interior cold air of the refrigerating compartment 31 to the first cooler 71 when it is cut away.

[0043] Referring to FIG. 3, the second rupture portions 37 defining the refrigerating compartment 31 may be provided at a sidewall of the second inner case 30 at positions corresponding to the first rupture portions 27 of the first inner case 20.

[0044] Specifically, the second rupture portions 37 are provided at positions opposite the upper and lower first rupture portions 27. Once the second rupture portions 37 are cut away, the first and second inner cases 20 and 30 communicate with each other through the first and second rupture portions 27.

[0045] An upper one of the second rupture portions 37 may function as a cold air inlet hole to introduce interior cold air of the freezing compartment 21 into the refrigerating compartment 31 when it is cut away, and a lower one of the second rupture portions 37 may function as a cold air outlet hole to discharge the cold air from the refrigerating compartment 31 into the freezing compartment 21 when it is cut away.

[0046] The second inner case 20 may be formed at a lower position of a rear surface thereof with guides 33,

to which a second cooler 73 (see FIG. 5) may be selectively mounted.

[0047] The guides 33 may be formed of ribs protruding from opposite sides of the second inner case 30. The guides 33 may be integrally formed with the second inner case 30, or may be separately prefabricated and then, coupled to the second inner case 30.

[0048] More specifically, when the freezing compartment 21 and the refrigerating compartment 31 are cooled by use of a single cooler, the first cooler 71 is installed only in the seating portion 23 of the first inner case 30. On the other hand, when the freezing compartment 21 and the refrigerating compartment 31 are cooled by use of two coolers, the first cooler 71 is installed in the seating portion 23 of the first inner case 30, and the second cooler 73 is mounted to the guides 23 of the second inner case 30.

[0049] With the above described configuration in which the first inner case 20 and the second inner case 30 are formed via injection molding, in the case where the freezing compartment 21 and the refrigerating compartment 31 are cooled by use of a single cooler, the first and second rupture portions 27 and 37 are cut away to communicate the freezing compartment 21 and the refrigerating compartment 31 with each other. On the other hand, in the case where the freezing compartment 21 and the refrigerating compartment 31 are independently cooled by use of two coolers, it may be unnecessary to cut away the first and second rupture portions 27 and 37, allowing use of the first and second inner cases 20 and 30 having a common configuration.

[0050] FIG. 4 is a sectional view illustrating the interior of a refrigerator using a single cooler according to an embodiment.

[0051] As shown in FIG. 4, in the case of a refrigerator in which temperatures of the freezing compartment 21 and the refrigerating compartment 31 are adjusted using the single cooler 71, the first and second rupture portions 27 and 37 of the first and second inner cases 20 and 30 may be cut away to communicate the first and second inner cases 20 and 30 with each other, prior to mounting the first and second inner cases 20 and 30 into the refrigerator.

[0052] Specifically, the first cooler 71 is located in a lower region of the first inner case 20 defining the freezing compartment 21, and is covered with the freezing-compartment cold-air duct 50.

[0053] The freezing-compartment cold-air duct 50 may be provided, e.g., with the first cooler 71 to generate cold air, a flow path (not shown) along which cold air generated from the first cooler 71 moves, and a blowing fan (not shown) to blow the cold air generated from the first cooler 71 to cold air discharge holes 51.

[0054] The cold air generated from the first cooler 71 is delivered through the freezing-compartment cold-air duct 50 to the upper first rupture portion 27 that has been cut away. After the cold air is introduced into a refrigerating-compartment cold-air duct 60 through the upper

second rupture portion 37 that has been cut away to correspond to the upper first rupture portion 27, the cold air may be discharged into the refrigerating compartment 31 through cold air discharge holes 61.

[0055] The cold air, which has been used to cool the refrigerating compartment 31, may be returned to the first cooler 71 through the lower first rupture portion 27 of the first inner case 20 that has been cut away to correspond to the lower second rupture portion 37 of the second inner case 30.

[0056] In the present embodiment, instead of mounting the second cooler 73 to the guides 33 of the second inner case 30, a drawer type storage container 75 may be slidably coupled to the guides 33 so as to be pulled out or pushed into the second inner case 30.

[0057] In FIG. 4, reference numeral 78 represents shelves of the storage compartments 21 and 31, to support food thereon.

[0058] FIG. 5 is a sectional view illustrating the interior of a refrigerator using two coolers according to an embodiment.

[0059] As shown in FIG. 5, in the case of a refrigerator in which temperatures of the freezing compartment 21 and the refrigerating compartment 31 are adjusted using the two coolers 71 and 73, the first and second inner cases 20 and 30 are mounted into the first and second inner cases 20 and 30 without cutting away the first and second rupture portions 27 and 37.

[0060] The first cooler 71 may be located in a lower region of the first inner case 20 defining the freezing compartment 21, and the second cooler 73 may be supported by the guides 33 in a lower region of the second inner case 30.

[0061] The first and second inner cases 20 and 30 may be provided with the freezing-compartment cold-air duct 50 and the refrigerating-compartment cold-air duct 60, which cover front surfaces of the first and second coolers 71 and 73 respectively.

[0062] The freezing-compartment cold-air duct 50 and the refrigerating-compartment cold-air duct 60 may be provided respectively with flow paths (not shown) along which cold air moves, and blowing fans (not shown) to blow the cold air to the cold air discharge holes 51 and 61 of the cold air ducts 50 and 60.

[0063] With the above described configuration, temperature of the freezing compartment 21 and the refrigerating compartment 31 may be adjusted via operation of the first and second coolers 71 and 73 that are provided respectively in independent spaces.

[0064] Accordingly, with use of the rupture portions 27 and 37 according to the embodiment, the first and second inner cases 20 and 30 may have a common configuration without a separate configuration change regardless of whether the refrigerator includes a single cooler or two coolers.

[0065] That is, it may be unnecessary to prepare separate molds to form different inner cases by injection molding according to whether a refrigerator includes a

single cooler or two coolers, resulting in remarkable reduction in manufacturing costs.

[0066] As apparent from the above description, a refrigerator according to the embodiment includes an inner case having a common configuration regardless of whether the refrigerator is of single cooler type or dual cooler type.

[0067] 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 refrigerator comprising:

a first inner case to define a freezing compartment; and
a second inner case to define a refrigerating compartment,
wherein the first inner case and the second inner case are formed via injection molding and are provided respectively with rupture portions, the rupture portions being cut away to communicate the first and second inner cases with each other.

2. The refrigerator according to claim 1, wherein the first inner case includes a seating portion indented from a rear surface thereof, so that a first cooler to cool the freezing compartment is installed in the seating portion.

3. The refrigerator according to claim 2, wherein the second inner case includes a guide arranged in a lower region thereof, so that a second cooler to cool the refrigerating compartment is installed to the guide.

4. The refrigerator according to claim 3, wherein the guide is integrally formed with the second inner case.

5. The refrigerator according to claim 3, wherein the rupture portions of the first inner case are located at upper and lower locations of a sidewall of the seating portion.

6. The refrigerator according to claim 5, wherein the rupture portions of the second inner case are located at a sidewall of the second inner case at positions corresponding to the rupture portions of the first inner case.

7. The refrigerator according to claim 3, wherein the guide includes a pair of ribs protruding from opposite sides of a rear surface of the second inner case.

8. The refrigerator according to claim 1, wherein the first and second inner cases communicate with each other as the rupture portions are cut away, and the first inner case is provided with a first cooler to adjust temperatures of the freezing compartment and the refrigerating compartment. 5
9. The refrigerator according to claim 1, further comprising first and second coolers provided respectively in the first and second inner cases to adjust temperatures of the freezing compartment and the refrigerating compartment, wherein the rupture portions are kept without cutting away. 10
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10. The refrigerator according to claim 1, wherein the rupture portions are cut away to communicate the refrigerating compartment and the freezing compartment with each other when refrigerating compartment and the freezing compartment are cooled using a single cooler, but are kept without cutting away when the refrigerating compartment and the freezing compartment are cooled respectively using separate coolers. 20
25
11. The refrigerator according to claim 10, wherein the rupture portions are integrally formed with the first and second inner cases upon injection molding of the first and second inner cases. 30
12. The refrigerator according to claim 11, wherein the rupture portions are cut away to communicate the first and second inner cases with each other, and the first inner case is provided with a first cooler to cool the separate compartments. 35
13. The refrigerator according to claim 12, further comprising a freezing-compartment cold-air duct having a cold air discharge hole through which cold air generated from the first cooler is discharged, the freezing-compartment cold-air duct being configured to cover the first cooler. 40
14. The refrigerator according to claim 11, wherein the rupture portions are kept without cutting away, the first inner case is provided with a first cooler to cool the freezing compartment, and the second inner case is provided with a second cooler to cool the refrigerating compartment. 45
50
15. The refrigerator according to claim 14, further comprising;
a freezing-compartment cold-air duct to cover the first cooler provided in the first inner case; and
a refrigerating-compartment cold-air duct to cover the second cooler provided in the second inner case. 55

FIG. 1

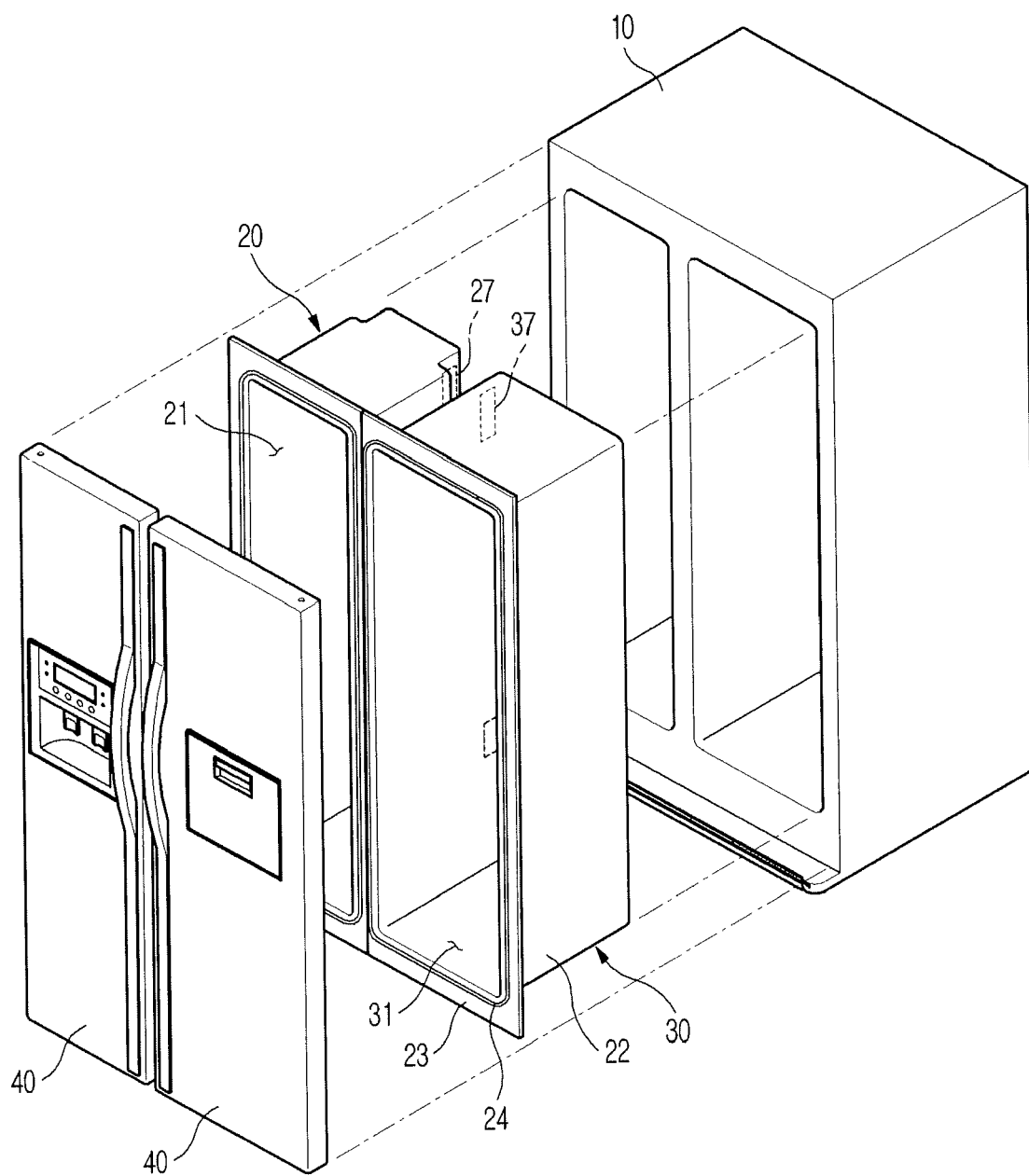


FIG. 2

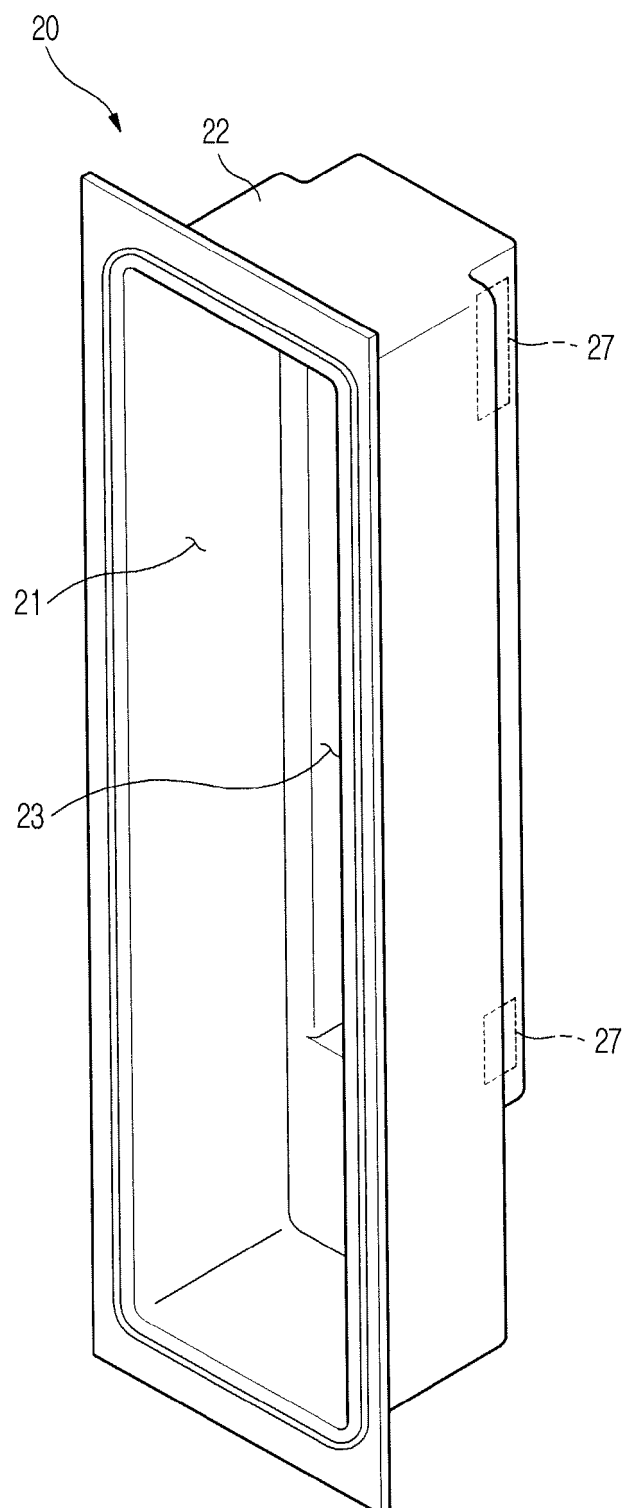


FIG. 3

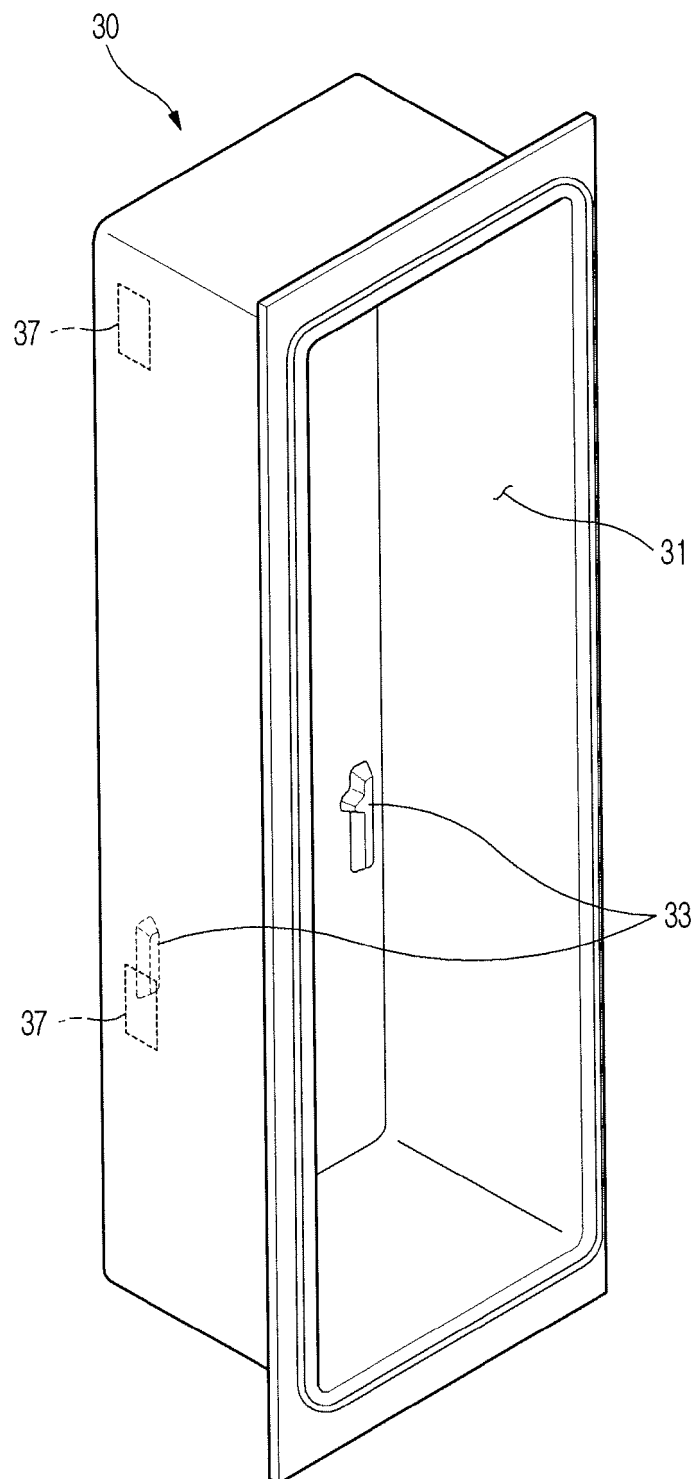


FIG. 4

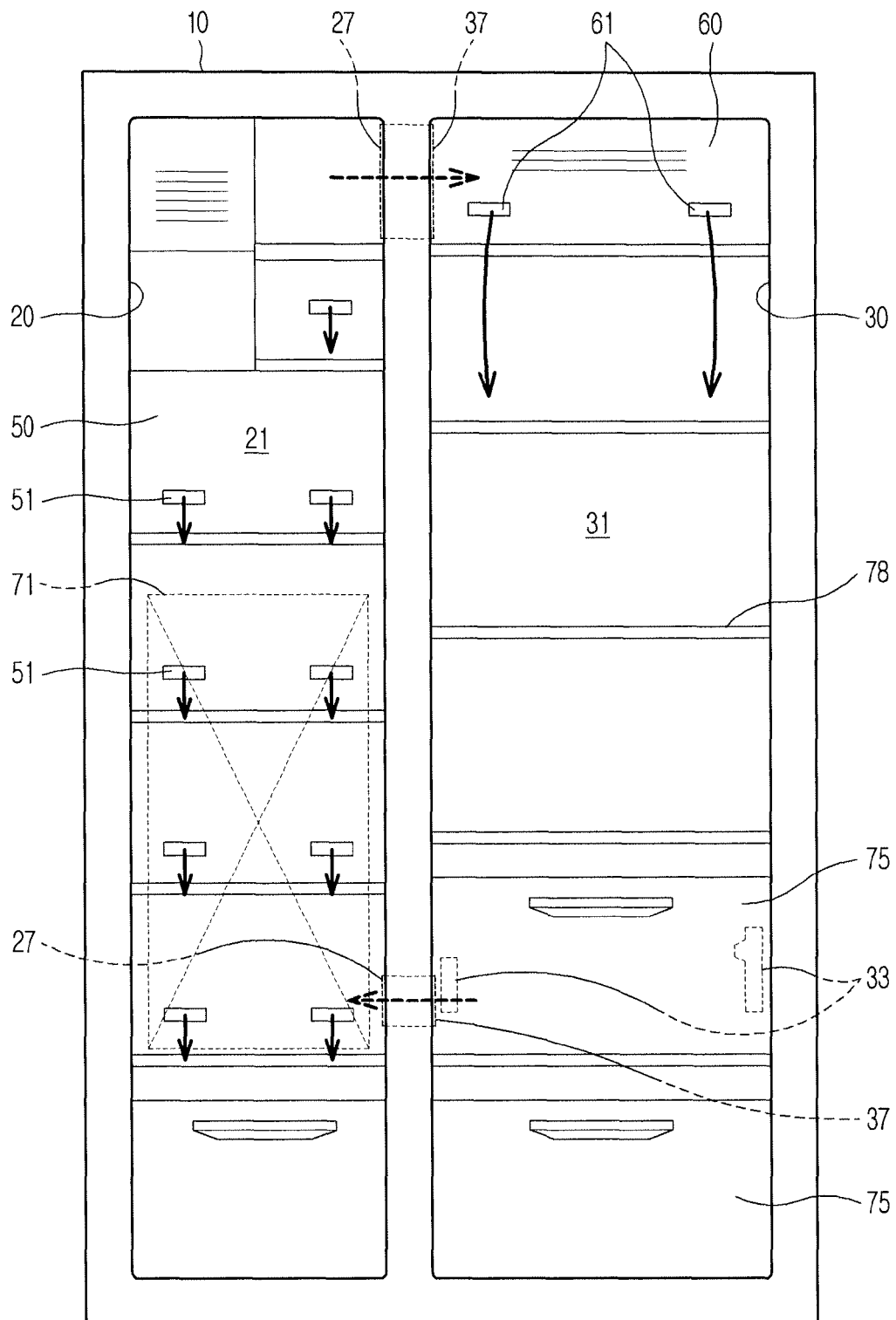
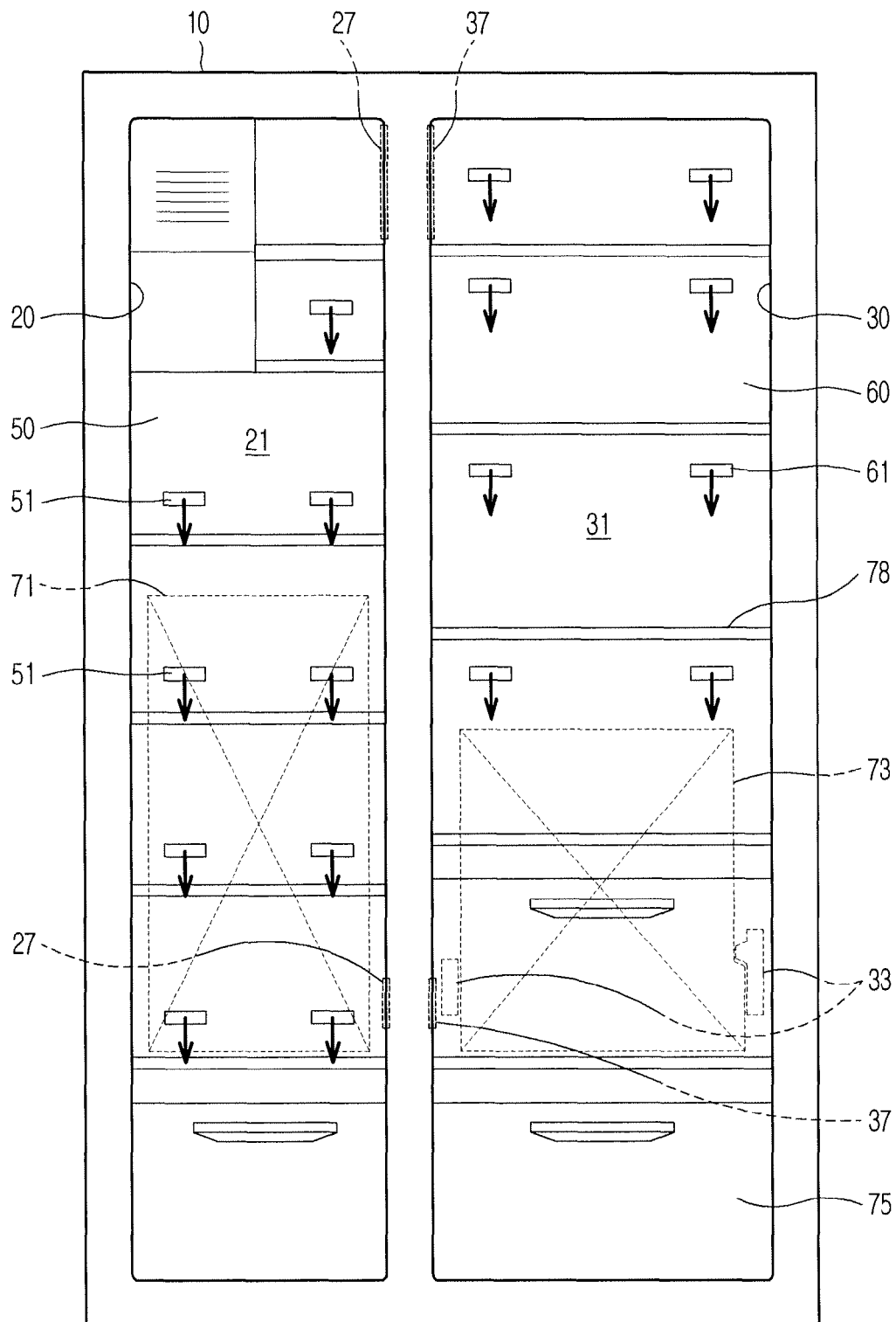


FIG. 5



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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