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(71) Applicants:
- **Qingdao Haier Refrigerator Co., Ltd**
  Qingdao, Shandong 266101 (CN)
- **Haier Smart Home Co., Ltd.**
  Qingdao, Shandong 266101 (CN)
- **Aqua Co., Ltd**
  Chuou-Ku
  Tokyo 103-0012 (JP)

(72) Inventors:
- **TOYOSHIMA, Masashi**
  Tokyo 103--0012 (JP)
- **KATO, Naoto**
  Tokyo 103--0012 (JP)

(74) Representative: **Lavoix**
Bayerstraße 83
80335 München (DE)

(54) CONTAINER CONNECTION MODULE AND REFRIGERATION APPLIANCE HAVING SAME

(57) A container connection module and a refrigeration appliance having same. The container connection module 40 comprises: a container connection portion 44 connected to a drinking nozzle 43 of a drinking container 42; and an outflow adjustment portion 45 that blocks drinking water from flowing out of the drinking container 42 when being not operated by a user, and causes the drinking water to flow out of the drinking container 42 when being operated by the user. The container connection portion 44 has an outer diameter that tapers towards a container side. A gap between the container connection portion 44 and the drinking nozzle 43 is sealed by means of contact of the outer side surface of the container connection portion 44 with the inner wall of the drinking nozzle 43.

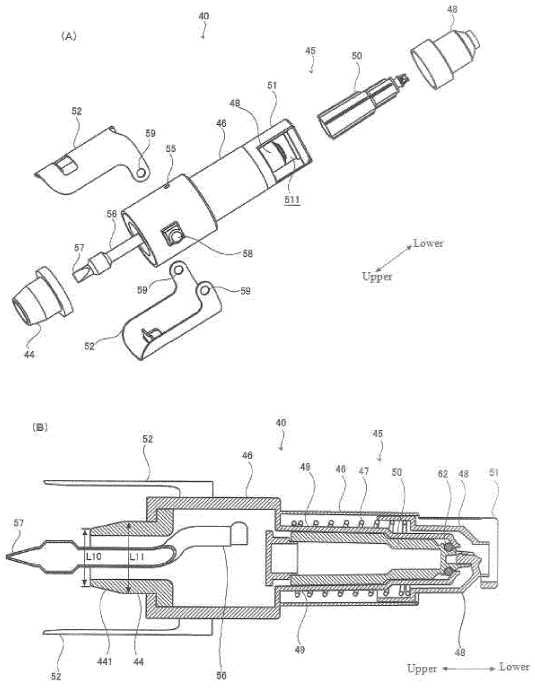

FIG. 4

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Description

TECHNICAL FIELD

[0001] The present invention relates to a container connecting module and a refrigerating appliance having the same.

BACKGROUND

[0002] Traditionally, it is known that a refrigerating appliance having a water supply mechanism is described in Japanese Patent 1 Laid-Open Publication No. 2017-36061. In this refrigerating appliance, a water supply tank for storing drinking water is arranged on the inner side of a heat insulating door that seals a refrigerating chamber formed on the upper layer of a heat insulating cabinet, a water supply chamber with a cavity is formed on the outer side of the heat insulating door, and a water injection rod is disposed inside the water supply chamber. In addition, a water injection portion communicated with the water supply tank is disposed on the inner side of the upper portion of the water supply chamber.

[0003] In the water supply chamber of the refrigerating appliance adopting the above structure, cooled drinking water is supplied to a cup from the water supply box through the water injection portion as a user uses the cup to press the water injection rod.

[0004] However, in the refrigerating appliance with the above water supply mechanism, it is necessary to dispose the water supply tank dedicated to water supply on the inner side of the heat insulating door. In addition, if drinking water inside the water supply tank is insufficient, it needs to supply water to the water supply tank by the user. As a result, there is a problem of inconvenient use of the water supply mechanism. In addition, in the case where tap water is supplied to the water supply tank, there is another problem that the safety of the tap water and the like may not be guaranteed depending on the countries and regions using the refrigerating appliance.

SUMMARY

[0005] In view of the above circumstances, an object of the present invention is to provide a container connecting module capable of enabling a drinking container to be used as a water supply mechanism in a refrigerating appliance in a simple structure, and a refrigerating appliance having the same.

[0006] A container connecting module is used for being mounted at a drinking opening of a drinking container and includes: a container connecting portion inserted into and connected with the drinking opening of the drinking container; and an outflow regulating portion for stopping and allowing the supply of drinking water from the drinking container, wherein the outer diameter of the container connecting portion is formed as decreasing along a direction towards a drinking container side, and a gap between the container connecting portion and the drinking opening is sealed by contacting the inner wall of the drinking opening of the drinking container with the outer side surface of the container connecting portion. According to the present invention, by contacting the inner wall of the drinking opening of the drinking container with the outer side surface of the container connecting portion, the gap between the drinking opening and the container connecting portion can be sealed even if the type of the container connecting portion and the inner diameter of the drinking opening are mismatched to prevent the drinking water from leaking from space between the drinking opening and the container connecting portion.

[0007] In a further embodiment of the present invention, the outflow regulating portion includes a cylindrical housing; a first movable cylindrical portion disposed inside the housing, pressed by a pressing member and movably disposed along the axial direction of the housing; a fixed cylindrical portion being integrally formed inside the housing and having one end inserted into the first movable cylindrical portion; and a second movable cylindrical portion disposed inside the fixed cylindrical portion and movably disposed along the axial direction together with the first movable cylindrical portion, wherein when no external force against the pressing member acts on the first movable cylindrical portion, space between the fixed cylindrical portion and the second movable cylindrical portion is sealed by a force applied by the pressing member, such that the supply of the drinking water from the drinking container is stopped; and when an external force against the pressing member acts on the first movable cylindrical portion, a gap is generated between the fixed cylindrical portion and the second movable cylindrical portion, such that the supply of the drinking water from the drinking container is allowed. According to the present invention, the second movable cylindrical portion moves according to a user's operation. Thus, the drinking water can be prevented from flowing out when no user's operation exists, and can be supplied when the user's operation exists.

[0008] In a further embodiment of the present invention, the outflow regulating portion includes a cover portion surrounding the first movable cylindrical portion. According to the present invention, as the cover portion surrounds the first movable cylindrical portion, the user can be prevented from inadvertently contacting the first movable cylindrical portion and further the drinking water is prevented from flowing out at an inappropriate time.

[0009] In a further embodiment of the present invention, the outflow regulating portion further includes a rotary meshing portion rotatably mounted on the housing and meshed with the drinking container. According to the present invention, as the rotary meshing portion is meshed with the drinking container, the container connecting portion can be firmly mounted at the drinking opening of the drinking container.

[0010] In a further embodiment of the present invention, the outflow regulating portion further includes an

opening portion formed by forming an opening in a part of the housing; a cylindrical pipe portion being embedded into the housing and having one end connected with the opening portion and the other end led to the outside from the container connecting portion; and a check valve connected with the other end of the pipe portion. According to the present invention, as the check valve communicated with the outside can be disposed in the drinking container, the drinking water can be supplied smoothly from the drinking water.

[0011] A refrigerating appliance includes the container connecting module; a door for sealing a storing chamber; an accommodating region being formed on an inner side surface of the door facing the storing chamber and accommodating the drinking container which makes the container connecting module face downward; a drinking water supply portion formed on an outer side surface facing the outside and equipped with an end of the container connecting module; and a supply rod with one end abutted with the container connecting module and the other end laterally disposed on the drinking water supply portion. According to the present invention, drinking water can be supplied to a cup via the container connecting module as the user uses a container such as the cup to press the supply rod inward.

[0012] In a further embodiment of the present invention, the refrigerating appliance further includes an opening which is formed below the accommodating region and into which the container connecting module is inserted; and a movable cover being rotatably disposed near the accommodating region and plugging the opening. According to the present invention, as the movable cover can plug the opening when the drinking container is not accommodated in the accommodating region, cold air in a refrigerating chamber can be prevented from escaping to the outside via the opening.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013]

FIG. 1 is a front view showing an appearance of a refrigerating appliance according to an embodiment of the present invention;

FIG. 2 is a lateral sectional view showing an internal structure of the refrigerating appliance according to the embodiment of the present invention;

FIG. 3 is a stereoscopic diagram showing a container connecting module according to an embodiment of the present invention;

FIG. 4 is a diagram showing the container connecting module according to the embodiment of the present invention, wherein (A) is an exploded view and (B) is a sectional view;

FIG. 5 is a diagram showing the container connecting module according to the embodiment of the present invention, wherein (A) is a sectional view showing an intermediate stage in which a drinking container and the container connecting module are connected, and (B) is a sectional view showing a state in which the container connecting module and the drinking container are connected;

FIG. 6 is a stereoscopic diagram showing a state in which the drinking container connected with the container connecting module according to the embodiment of the present invention is mounted into a heat insulating door of a refrigerating appliance, wherein (A) is a stereoscopic diagram showing an intermediate stage of mounting, and (B) is a stereoscopic diagram showing a state after mounting;

FIG. 7 is a diagram showing a state in which the drinking container connected with the container connecting module according to the embodiment of the present invention is mounted into a heat insulating door of a refrigerating appliance, wherein (A) is a stereoscopic diagram showing an intermediate state of mounting, and (B) is a stereoscopic diagram showing a state after mounting;

FIG. 8 is a diagram showing an associating structure between the container connecting module according to the embodiment of the present invention and a supply rod, wherein (A) is a stereoscopic diagram showing the container connecting module and the supply rod, and (B) is a stereoscopic diagram showing the supply rod;

FIG. 9 is a diagram showing the container connecting module according to the embodiment of the present invention, wherein (A) is a sectional view showing the container connecting module in a closed state in which drinking water is prevented from flowing out, and (B) is a sectional view showing the container connecting module in an open state in which the drinking water is allowed to flow out; and

FIG. 10 is a diagram showing a structure in which the drinking container connected with the container connecting module according to the embodiment of the present invention is mounted into the heat insulating door, wherein (A) shows a movable cover in an open state, and (B) shows the movable cover in a closed state.

[0014] Reference signs in the figures: 10-refrigerating appliance, 11-heat insulating cabinet, 12-shell, 13-inner; 14-heat insulating material, 15-refrigerating chamber, 16-air supply fan, 17-freezing chamber, 18-upper freezing chamber, 19-lower freezing chamber, 20-vegetable chamber, 21-heat insulating door, 22-cooler, 23-heat insulating door, 24-heat insulating door, 25-heat insulating door, 26-cooling chamber, 27-compressor, 40-container connecting module, 41-supply rod, 411-abutting portion, 412-corner portion, 413-contact portion, 414-protrusion portion, 415-meshing hole, 42-drinking container, 421-flange portion, 43-drinking opening, 44-container connecting portion, 441-inclined surface, 45-outflow regulating portion, 46-housing, 47-pressing member, 48-first movable cylindrical portion, 49-fixed cylindrical portion,

50-second movable cylindrical portion, 51-cover portion, 52-rotary meshing portion, 521-meshing opening, 53-accommodating region, 54-drinking water supply portion, 5-opening portion, 56-pipe portion, 57-check valve, 58-meshing protrusion, 59-engaging opening, 60-baffle portion, 61-cup, 62-sealing member, 63-opening, and 64-movable cover.

DETAILED DESCRIPTION

[0015] A container connecting module 40 and a refrigerating appliance 10 according to embodiments of the present invention are described in detail below with reference to the accompanying drawings. In the following description, in principle, the same symbol is given to the same member for omitting repeated description. In addition, directions, i.e., upper, lower, front, rear, left and right, are used appropriately, wherein left and right means left and right in the case where a refrigerating appliance 10 is viewed from the front. In addition, in embodiments, as an example, the refrigerating appliance 10 has a freezing chamber and a refrigerating chamber, but the refrigerating appliance 10 may only have the freezing chamber or the refrigerating chamber.

[0016] FIG. 1 is a front view showing an appearance of a refrigerating appliance 10 according to an embodiment of the present invention. The refrigerating appliance 10 has a heat insulating cabinet 11 as a main body, into which a storing chamber for storing foods and the like is formed. The storing chamber includes a refrigerating chamber 15, an upper freezing chamber 18, a lower freezing chamber 19 and a vegetable chamber 20 from top to bottom in sequence. In addition, both the upper freezing chamber 18 and the lower freezing chamber 19 are storing chambers within a freezing temperature range, and collectively called as a freezing chamber 17 sometimes in the following description. Here, the upper freezing chamber 18 is separable in a horizontal direction, and one side of the upper freezing chamber 18 is used as an ice making chamber.

[0017] Openings are formed in the front of the heat insulating cabinet 11, and heat insulating doors 21, which are freely opened and closed, are disposed at the openings corresponding to the above respective storing chambers, respectively. The heat insulating door 21 is separable in a horizontal direction and seals a front surface of the refrigerating chamber 15. Therefore, the upper end and the lower end of the outer side of the heat insulating door 21 in the width direction are freely and rotatably mounted on the heat insulating cabinet 11. In addition, the heat insulating door 23, the heat insulating door 24 and the heat insulating door 25 are integrally assembled with respective accommodating containers, respectively, and are supported by the heat insulating cabinet 11 so as to be freely pulled out toward the front of the refrigerating appliance 10. Specifically, the heat insulating door 23 seals the upper freezing chamber 18, the heat insulating door 24 seals the lower freezing chamber 19, and the heat insulating door 25 seals the vegetable chamber 20.

[0018] In this embodiment, a drinking water supply portion 54 is formed on the heat insulating door 21 sealing a left portion of the freezing chamber 15. As described below, the drinking water supply portion 54 is a concave portion for supplying drinking water cooled inside the refrigerating chamber 15 to a cup 61.

[0019] FIG. 2 is lateral sectional view showing an internal structure of the refrigerating appliance 10. The heat insulating cabinet 11 as the main body of the refrigerating appliance 10 consists of an shell 12 which has a front opening and is made of a steel plate; and an inner 13 which is disposed inside the shell 12, has a front opening and is made of synthetic resin. There is a gap between the inner 13 and the shell 12. The gap between the shell 12 and the inner 13 is filled with a heat insulating material 14 made of polyurethane for foaming. In addition, the above respective heat insulating doors 21 also adopt the same heat insulating structure as the heat insulating cabinet 11.

[0020] The refrigerating chamber 15 is separated from the freezing chamber 17 located below the refrigerating chamber 15 by a heat-insulating partition wall. Moreover, the freezing chamber 17 is separated from the vegetable chamber 20 by a heat-insulating partition wall.

[0021] A refrigerating chamber air supply path as an air supply path for supplying cold air to the refrigerating chamber 15 is formed on the back of the refrigerating chamber 15.

[0022] A freezing chamber air supply path for allowing cold air cooled by a cooler 22 to flow toward the freezing chamber 17 is formed on the rear side of the freezing chamber 17. A cooling chamber 26 is formed on a further rear side of the freezing chamber air supply path, and the cooler 22 is disposed inside the cooling chamber 26, and is an evaporator for cooling air circulating in the refrigerating appliance.

[0023] Air inside the cooling chamber 26 cooled by the cooler 22 is blown to the refrigerating chamber 15, the freezing chamber 17 and the vegetable chamber 20 through an air supply fan 16.

[0024] The cooler 22 is connected with a refrigerant pipe through a compressor 27, a heat radiator not shown in the figures, and a capillary tube not shown in the figures and used as an expansion means, to form a vapor compression type freezing circulating loop.

[0025] A drinking container 42 is disposed on the inner side of the heat insulating door 21, and drinking water inside the drinking container 42 is also cooled inside the refrigerating chamber 15. In addition, the drinking water supplied from the drinking container 42 is supplied to the cup 61 disposed by the user at a drinking water supply portion 54.

[0026] FIG. 3 is a stereoscopic diagram showing the container connecting module 40. The container connecting module 40 mainly includes a container connecting portion 44 and an outflow regulating portion 45. The con-

tainer connecting module 40 is mounted at a drinking opening 43 of the drinking container 42 described later, prevents the drinking water from flowing out of the drinking container 42 when no user's operation exists, and supplies the drinking water to the cup 61 and the like from the drinking container 42 when the user's operation exists.

[0027] The container connecting portion 44 takes a shape with the outer diameter decreasing upwards. A gap between the container connecting portion 44 and the drinking opening 43 is sealed by contacting an outer side surface of the container connecting portion 44 with an inner wall of the drinking opening 43 of the drinking container 42 described later. A check valve 57 is led out to the outside from an upper end opening of the container connecting portion 44.

[0028] The outflow regulating portion 45 has the functions of preventing the drinking water from being supplied from the drinking container 42 when no user's operation exists and supplying the drinking water from the drinking container 42 when the user's operation exists. A specific structure of the outflow regulating portion 45 will be described in detail below with reference to FIG. 4.

[0029] Rotary meshing portions 52 are rotatably mounted at positions near an upper end of the housing 46 and meshed with the drinking container 42 described later. Here, two rotary meshing portions 52 are mounted on opposite portions of the outflow regulating portion 45, respectively. In addition, a substantially rectangular meshing opening 521 is formed in an upper portion of the rotary meshing portion 52. As described below, the meshing opening 521 is meshed with a flange portion 421 of the drinking container 42.

[0030] The housing 46 constitutes a design portion of the container connecting module 40 and has a substantially cylindrical shape with an upper portion thicker than a lower portion thereof. In addition, a cover portion 51 surrounding a first movable cylindrical portion 48 is disposed at a lower end portion of the housing 46.

[0031] The structure of the container connecting module 40 is described in detail with reference to FIG. 4. FIG. 4(A) is an exploded view showing the container connecting module 40, and FIG. 4(B) is a lateral sectional view showing the container connecting module 40.

[0032] With reference to FIG. 4(A), meshing protrusions 58 substantially protruding cylindrically toward the outside along the radial direction are formed at positions opposite to the outer peripheral surface of the housing 46, respectively. The meshing protrusions 58 of the housing 46 are rotatably embedded into engaging openings 59 formed in lower portions of the rotary meshing portions 52, respectively. Thus, the rotary meshing portions 52 are rotatably disposed outside the housing 46.

[0033] As shown in FIG. 4(B), the container connecting module 40 has the housing 46, the first movable cylindrical portion 48, a fixed cylindrical portion 49 and a second movable cylindrical portion 50 radially.

[0034] The first movable cylindrical portion 48 is disposed below the inner side of the housing 46, is pressed by a pressing member 47, and moves along the axial direction according to the user's operation. The lower end portion of the first movable cylindrical portion 48 has a substantially conical shape with the diameter decreasing downward. In addition, the lower end portion of the first movable cylindrical portion 48 is meshed with the lower end portion of the second movable cylindrical portion 50.

[0035] The fixed cylindrical portion 49 is a substantially cylindrical member disposed inside the housing 46. The upper end portion of the fixed cylindrical portion 49 is connected with the housing 46 and is tapering in diameter. The fixed cylindrical portion 49 is fixed inside the container connecting module 40.

[0036] The second movable cylindrical portion 50 is a substantially cylindrical member embedded in the fixed cylindrical portion 49 with the outer diameter gradually decreasing downward, and is substantially cylindrical. As described above, the lower end portion of the second movable cylindrical portion 50 is meshed with the lower end portion of the first movable cylindrical portion 48. Therefore, after being subjected to a force applied by the pressing member 47, the second movable cylindrical portion 50 moves vertically together with the first movable cylindrical portion 48.

[0037] A sealing member 62 is meshed with the outer surface of the lower end portion of the second movable cylindrical portion 50. The sealing member 62 is an O-ring made of, for example, rubber or flexible resin. Through the force applied by the pressing member 47, the sealing member 62 is compressed and thus deformed between the inner surface of the fixed cylindrical portion 49 and the outer surface of the second movable cylindrical portion 50, so that space between the inner surface of the fixed cylindrical portion 49 and the outer surface of the second movable cylindrical portion 50 is sealed. Thus, as described later, the supply of the drinking water from the drinking container 42 is stopped when no user's operation exists. In addition, as described later, through the user's operation, if the first movable cylindrical portion 48 moves upward, the second movable cylindrical portion 50 also moves upward inside the fixed cylindrical portion 49 at the same time and thus the sealing member 62 leaves the inner surface of the fixed cylindrical portion 49. Hence, the drinking water is supplied to the outside from the drinking container 42 through the space between the inner surface of the fixed cylindrical potion 49 and the outer surface of the second movable cylindrical portion 50.

[0038] The pressing member 47, such as a spiral spring, is disposed between the housing 46 and the first movable cylindrical portion 48. The upper end portion of the pressing member 47 is abutted against a wall-shaped portion formed inside the housing 46, and the lower end portion of the pressing member 47 is abutted against a step portion formed inside the first movable cylindrical portion 48. The pressing member 47 presses the first

movable cylindrical portion 48 downward. Thus, the sealing member 62 mounted outside the second movable cylindrical portion 50 meshed with the first movable cylindrical portion 48 is pressed toward the inner surface of the fixed cylindrical portion 49.

[0039] The cover portion 51 is disposed at the lower end portion of the housing 46 and surrounds and protects the first movable cylindrical portion 48.

[0040] As described above, the container connecting portion 44 is a substantially cylindrical member mounted at the upper end of the housing 46 and is formed of a material that is easily elastically deformed, such as rubber and flexible resin. The container connecting portion 44 has a substantially cylindrical shape as a whole, and an external upper end portion thereof takes a shape with the outer diameter decreasing upward. That is, an inclined surface 441 is formed outside the upper end of the container connecting portion 44. The outer diameter L11 at the lower end of the inclined surface is set to be greater than or equal to the maximum outer diameter of the drinking opening 43 of the drinking container 42 described later. The outer diameter L10 at the upper end of the inclined surface is set to be less than or equal to the minimum outer diameter of the drinking opening 43 of the drinking container 42 described later. Thus, even if the inner diameter of the drinking opening 43 of the drinking container 42 described later is uneven, the outside of the inclined surface 441 of the container connecting portion 44 can be reliably embedded inside the drinking opening 43 of the drinking container 42.

[0041] In Japan, the drinking container 42 described with reference to FIG. 5 is of such two types that the inner diameter of the drinking opening 43 thereof is 20 mm and the inner diameter of the drinking opening 43 thereof is 21 mm. Therefore, in this embodiment, as an example, L11 as the maximum outer diameter of the inclined surface 441 is set to 21 mm or above, and L10 as the minimum outer diameter of the inclined surface 441 is set to be less than 20 mm. By setting the outer diameter of the inclined surface 441 in such a range, the container connecting portion 44 of the container connecting module 40 may be inserted without a gap into the drinking opening 43 of the drinking container 42 with different opening diameters so as to prevent the drinking water from flowing out to the outside from space between the drinking opening 43 of the container connecting module 40 and the container connecting portion 44 of the container connecting module 40.

[0042] A pipe portion 56 is embedded into the upper portion of the housing 46. A lower end portion of the pipe portion 56 is communicated with an opening portion 55 (FIG. 4 (A)) formed in the housing 46, and the upper end portion of the housing 46 is led out to the outside from the opening of the container connecting portion 44. In addition, the upper end of the pipe portion 56 is connected with the check valve 57. The check valve 57 allows air introduced from the pipe portion 56 to circulate toward a drinking container 42 side, and prevents the drinking water from circulating toward a pipe portion 56 side.

[0043] FIG. 5 is a diagram showing the container connecting module 40, wherein FIG. 5(A) is a sectional view showing an intermediate stage in which the drinking container 42 is connected with the container connecting module 40, and FIG. 5(B) is a sectional view showing a state in which the container connecting module 40 is connected with the drinking container 42.

[0044] With reference to FIG. 5(A), the drinking opening 43 and the flange portions 421 are formed at the end of the drinking container 42. When the container connecting module 40 is mounted on the drinking container 42, first the rotary meshing portions 52 of the container connecting module 40 are opened by rotating outward along a radial direction.

[0045] In this state, the container connecting portion 44 of the container connecting module 40 is inserted into the drinking opening 43 of the drinking container 42. As described above, the minimum outer diameter of the inclined surface 441 of the container connecting portion 44 is set to be smaller than the inner diameter of the drinking opening 43. In addition, the maximum outer diameter of the inclined surface 441 is set to be greater than the inner diameter of the drinking opening 43. Therefore, when the container connecting portion 44 formed of a flexible material is inserted into the drinking opening 43, the outer surface of the container connecting portion 44 is in close fit with the inner surface of the drinking opening 43. Thus, the drinking water inside the drinking container 42 does not leak from a place where the drinking opening 43 is in contact with the container connecting portion 44.

[0046] With reference to FIG. 5(B), the rotary meshing portions 52 are closed inwards in the radial direction. Thus, the flange portions 421 of the drinking container 42 are meshed with the meshing openings 521 of the rotary meshing portions 52, and the container connecting module 40 is not disengaged from the drinking container 42.

[0047] FIG. 6 is a stereoscopic diagram showing a state in which the drinking container 42 connected with the container connecting module 40 is mounted into the heat insulating door 21 of the refrigerating appliance 10, FIG. 6(A) is a stereoscopic diagram showing an intermediate stage of mounting, and FIG. 6(B) is a stereoscopic diagram showing a state after mounting.

[0048] With reference to FIG. 6(A), an accommodating region 53 is formed by recessing an inner surface of the heat insulating door 21 forwards. A baffle portion 60 is disposed in the accommodating region 53. The baffle portion 60 is a substantially plate-shaped member and is mounted on the inner surface of the heat insulating door 21 in a state that the left end and the right end thereof can slide vertically. The accommodating region 53 has, for example, a volume capable of accommodating two drinking containers 42, such as two 2-liter PET bottles. The drinking container 42 is accommodated in the accommodating region 53 in a state that the container connecting module 40 is mounted at the lower end thereof.

When the drinking container 42 is stored in the accommodating region 53, the baffle portion 60 slides towards the lower side of the accommodating region 53. Thus, the operation of storing the drinking container 42 in the accommodating region 53 is not hindered by the baffle portion 60.

[0049] Here, when the drinking container 42 is placed by lowering the baffle portion 60, the accommodating operation of the heat insulating door 24 becomes easier. In addition, by raising the baffle portion 60, the drinking container 42 can be stabilized when the heat insulating door 21 is opened and closed. As shown in FIG. 6 (B), by raising the baffle portion 60, lock catches are meshed to work, and the drinking container 42 is slightly pressed forward. In addition, when the baffle portion 60 is lowered or raised, the baffle portion 60 is operated slightly away from the drinking container 42.

[0050] With reference to FIG. 6 (B), the baffle portion 60 moves upward. Thus, the lower portion of the drinking container 42 is supported by the baffle portion 60, and hence can be stably accommodated in the accommodating region 53.

[0051] FIG. 7 is a stereoscopic diagram showing a state in which the drinking container 42 connected with the container connecting module 40 is mounted into the heat insulating door 21 of the refrigerating appliance 10, wherein FIG. 7(A) is a sectional view of the heat insulating door 21, and FIG. 7(B) is a stereoscopic diagram of the heat insulating door 21 as viewed from the outside.

[0052] With reference to FIG. 7 (A), when the drinking container 42 is inversely accommodated in the accommodating region 53, the lower end of the container connecting portion 44 mounted on the drinking container 42 is exposed to the inner side of the upper end of the drinking water supply portion 54. In addition, a hook-shaped supply rod 41 is rotatably disposed on the inner side of the drinking water supply portion 54.

[0053] With reference to FIG. 7 (B), the drinking water supply portion 54 is a cavity formed by recessing rearward the lower portion of the front of the heat insulating door 21. The drinking water supply portion 54 has, for example, a volume capable of accommodating two cups 61 into which the drinking water is supplied from the drinking container 42.

[0054] FIG. 8 is a diagram showing an associating structure between the container connecting module 40 and the supply rod 41, wherein FIG. 8(A) is a stereoscopic diagram showing the container connecting module 40 and the supply rod 41, and FIG. 8(B) is a stereoscopic diagram showing the supply rod 41.

[0055] With reference to FIG. 8(A), the supply rod 41 is disposed at the lower end of the container connecting module 40. The upper end of the supply rod 41 is in contact with the lower end of the container connecting module 40. In detail, the lower end of the first movable cylindrical portion 48 is pressed against protrusion portions 414 of the supply rod 41 described later by the force applied by the pressing member 47 shown in FIG. 4(B).

[0056] With reference to FIG. 8(B), the supply rod 41 is a substantially hook-shaped member, and has an abutting portion 411 vertically extending and being abutted against the cup 61, contact portions 413 extending horizontally and being in contact with the container connecting module 40, a corner portion 412 as a connecting portion between the contact portions 413 and the abutting portion 411, and meshing holes 415 acquired by forming openings in front ends of the contact portions 413. In addition, the protrusion portion 414 is formed by partially bulging the rear end of the upper side of the contact portion 413 upward. The supply rod 41 is rotatably connected with the body side of the refrigerating appliance 10 through the meshing holes 415.

[0057] By adopting such a structure, when the user presses the front of the abutting portion 411 of the supply rod 41 backward with the rear end of the cup 61 not shown, the supply rod 41 rotates with the meshing holes 415 as a pivot point, and the protrusion portions 414 are pushed up. Thus, as described later, upper end portions of the contact portions 413 push up the first movable cylindrical portion 48 and the second movable cylindrical portion 50 of the container connecting module 40, and hence, the drinking water can be supplied from the drinking container 42 to the cup 61.

[0058] FIG. 9 is a diagram showing the container connecting module 40, FIG. 9(A) is a sectional view showing the container connecting module 40 in a closed state in which drinking water is prevented from flowing out; and FIG. 9(B) is a sectional view showing the container connecting module 40 in an open state in which the drinking water is allowed to flow out.

[0059] With reference to FIG. 9 (A), in the container connection module 40 in the closed state, the first movable cylindrical portion 48 and the fixed cylindrical portion 49 are not pushed up from below. Therefore, the space between the outer surface of the second movable cylindrical portion 50 and the inner surface of the fixed cylindrical portion 49 is sealed by the sealing member 62. Thus, the drinking water stored in the above drinking container 42 does not flow out of the container connecting module 40.

[0060] With reference to FIG. 9(B), in the container connecting module 40 in the open state, the lower end of the first movable cylindrical portion 48 is pushed up by the protrusion portions 414 of the supply rod 41 shown in FIG. 8(B). Thus, the second movable cylindrical portion 50 is also pushed up inside the fixed cylindrical portion 49. Therefore, a sealing material 62 embedded in the top end of the second movable cylindrical portion 50 leaves the inner surface of the fixed cylindrical portion 49. Hence, the drinking water stored in the drinking container 42 flows through the space between the second movable cylindrical portion 50 and the fixed cylindrical portion 49 and is supplied to the cup 61 via the container connecting module 40. Afterwards, if the user removes the cup 61 from the abutting portion 411 shown in FIG. 8(B) after the cup 61 is filled with the drinking water, the container

connecting module 40 returns to the closed state shown in FIG. 9(A) and stops the supply of the drinking water.

[0061] With reference to FIG. 10, the structure in which the drinking container 42 is mounted in the accommodating region 53 of the heat insulating door 21 is further described. Here, a movable cover 64 that appropriately plugs openings 63 is disposed in the accommodating region 53. FIG. 10(A) shows the movable cover in an open state, and FIG. 10(B) shows the movable cover in a closed state.

[0062] With reference to FIG. 10(A), the openings 63 for insertion of the drinking openings 43 of the drinking containers 42 and the container connecting module 40 are formed in the bottom surface of the accommodating region 53. Here, two drinking containers 42 are accommodated in the accommodating region 53, and thus two openings 63 are formed. The openings 63 connect the refrigerating chamber 15 with the outside. Therefore, in the case where no drinking container 42 is disposed in the accommodating region 53, when the openings 63 are kept as they are, cold air in the refrigerating chamber 15 escapes outward through the openings 63, and there is a risk of reducing the cooling efficiency of the refrigerating chamber 15. Therefore, in this embodiment, the movable cover 64 is disposed in the accommodating region 53.

[0063] The movable cover 64 is a plate-shaped member having a substantially rectangular shape, and two ends of a lower side edge are rotatably mounted on the front end side of the bottommost portion of the accommodating region 53. Here, the movable cover 64 is accommodated on the inner side surface of the accommodating region 53 in an upright state.

[0064] With reference to FIG. 10(B), in the case where no drinking container 42 is accommodated in the accommodating region 53, the movable cover 64 is switched to the horizontal state by rotating the movable cover 64, and the openings 63 can be plugged by the movable cover 64. In this way, the cold air can be prevented from leaking to the outside through the openings 63. Further, stored items, such as food, can be carried and accommodated on the movable cover 64.

[0065] The following describes main effects achieved through this embodiment.

[0066] According to the present invention, as shown in FIG. 4(B), by contacting the inner wall of the drinking opening 43 of the drinking container 42 with the outer side surface of the container connecting portion 44, the gap between the container connecting portion 44 and the drinking opening 43 can be sealed even if the type of the container connecting portion and the inner diameter of the drinking opening are mismatched to prevent the drinking water from leaking from space between the container connecting portion 44 and the drinking opening 43.

[0067] In addition, as shown in FIG. 9, the second movable cylindrical portion 50 moves according to the user's operation. Thus, the supply of the drinking water can be stopped when no user's operation exists, and the drinking water can be supplied when the user's operation exists.

[0068] In addition, as shown in FIG. 4, as the cover portion 51 surrounds the first movable cylindrical portion 48, the user can be prevented from inadvertently contacting the first movable cylindrical portion 48, and further the drinking water is prevented from flowing out unnecessarily.

[0069] In addition, as shown in FIG. 4(B), as the rotary meshing portion 52 is meshed with the drinking container 42, the container connecting portion 44 can be firmly mounted at the drinking opening 43 of the drinking container 42.

[0070] In addition, as shown in FIG. 5, the check valve 57 communicated with the outside can be disposed in the drinking container 42, and thus, the drinking water can be supplied smoothly from the drinking water 42.

[0071] In addition, as shown in FIG. 2, the drinking water stored in the drinking container 42 can be cooled through the refrigerating chamber 15, and the cooled drinking water can be provided to the user through a simple structure.

[0072] The present invention is not limited to the above embodiments, and various other changes may be implemented without departing from the main purpose of the present invention. In addition, the above embodiments may be combined with one another.

Claims

1. A container connecting module (40) for being mounted at a drinking opening (43) of a drinking container (42), the container connecting module (40) comprising:

   a container connecting portion (44) inserted into and connected with the drinking opening (43) of the drinking container (42); and
   an outflow regulating portion (45) for stopping and allowing the supply of drinking water from the drinking container (42), wherein
   an outer diameter of the container connecting portion (44) is formed as decreasing along a direction towards a drinking container (42) side, and
   a gap between the container connecting portion (44) and the drinking opening (43) is sealed by contacting an inner wall of the drinking opening (43) of the drinking container (42) with an outer side surface of the container connecting portion (44).

2. The container connecting module (40) according to claim 1, wherein the outflow regulating portion (45) comprises:

   a cylindrical housing (46);
   a first movable cylindrical portion (48) disposed inside the housing (46), pressed by a pressing

member (47) and movably disposed along an axial direction of the housing (46);
a fixed cylindrical portion (49) being integrally formed inside the housing (46) and having one end inserted into the first movable cylindrical portion (48); and
a second movable cylindrical portion (50) disposed inside the fixed cylindrical portion (49) and movably disposed along the axial direction together with the first movable cylindrical portion (48), wherein
when no external force against the pressing member (47) acts on the first movable cylindrical portion (48), space between the fixed cylindrical portion (49) and the second movable cylindrical portion (50) is sealed by a force applied by the pressing member (47), such that the supply of the drinking water from the drinking container (42) is stopped; and
when an external force against the pressing member (47) acts on the first movable cylindrical portion (48), a gap is generated between the fixed cylindrical portion (49) and the second movable cylindrical portion (50), such that the supply of the drinking water from the drinking container (42) is allowed.

3. The container connecting module (40) according to claim 2, wherein the outflow regulating portion (45) comprises a cover portion (51) surrounding the first movable cylindrical portion (48).

4. The container connecting module (40) according to claim 2, wherein the outflow regulating portion (45) further comprises a rotary meshing portion (52) rotatably mounted on the housing (46) and meshed with the drinking container (42).

5. The container connecting module (40) according to claim 2, wherein the outflow regulating portion (45) further comprises:

an opening portion (55) formed by forming an opening (63) in a part of the housing (46);
a cylindrical pipe portion (56) being embedded into the housing (46) and having one end connected with the opening portion (55) and the other end led to the outside from the container connecting portion (44); and
a check valve (57) connected with the other end of the pipe portion (56).

6. A refrigerating appliance (10), comprising the container connecting module (40) according to claim 1, and further comprising:

a door (21,23,24,25) for sealing a storing chamber;
an accommodating region (53) being formed on an inner side surface of the door (21,23,24,25) facing the storing chamber and accommodating the drinking container (42) which makes the container connecting module (40) face downward;
a drinking water supply portion (54) formed on an outer side surface facing the outside and equipped with an end of the container connecting module (40); and
a supply rod (41) with one end abutted with the container connecting module (40) and the other end laterally disposed on the drinking water supply portion (54).

7. The refrigerating appliance (10) according to claim 6, further comprising:

an opening (63) which is formed below the accommodating region (53) and into which the container connecting module (40) is inserted; and
a movable cover (64) being rotatably disposed near the accommodating region (53) and plugging the opening (63).

8. The refrigerating appliance (10) according to claim 6, wherein the outflow regulating portion (45) comprises:

a cylindrical housing (46);
a first movable cylindrical portion (48) disposed inside the housing (46), pressed by a pressing member (47) and movably disposed along an axial direction of the housing (46);
a fixed cylindrical portion (49) being integrally formed inside the housing (46) and having one end inserted into the first movable cylindrical portion (48); and
a second movable cylindrical portion (50) disposed inside the fixed cylindrical portion (49) and movably disposed along the axial direction together with the first movable cylindrical portion (48), wherein
when no external force against the pressing member (47) acts on the first movable cylindrical portion (48), space between the fixed cylindrical portion (49) and the second movable cylindrical portion (50) is sealed by a force applied by the pressing member (47), such that the supply of the drinking water from the drinking container (42) is stopped; and
when an external force against the pressing member (47) acts on the first movable cylindrical portion (48), a gap is generated between the fixed cylindrical portion (49) and the second movable cylindrical portion (50), such that the supply of the drinking water from the drinking container (42) is allowed.

9. The refrigerating appliance (10) according to claim 8, wherein the outflow regulating portion (45) comprises a cover portion (51) surrounding the first movable cylindrical portion (48).

10. The refrigerating appliance (10) according to claim 8, wherein the outflow regulating portion (45) further comprises a rotary meshing portion (52) rotatably mounted on the housing (46) and meshed with the drinking container (42).

11. The refrigerating appliance (10) according to claim 8, wherein the outflow regulating portion (45) further comprises:

an opening portion (55) formed by forming an opening (63) in a part of the housing (46);
a cylindrical pipe portion (56) being embedded into the housing (46) and having one end connected with the opening portion (55) and the other end led to the outside from the container connecting portion (44); and
a check valve (57) connected with the other end of the pipe portion (56).

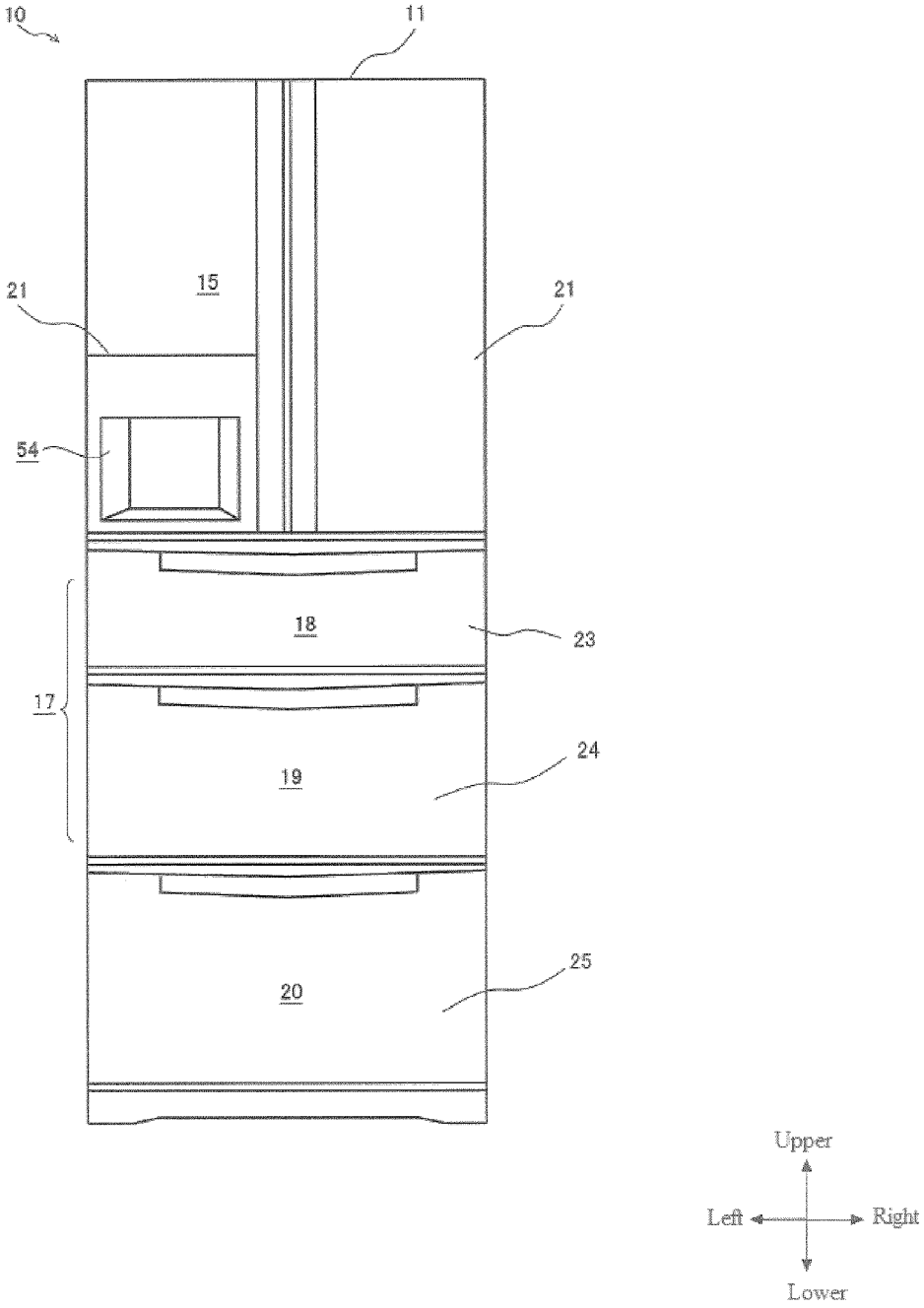
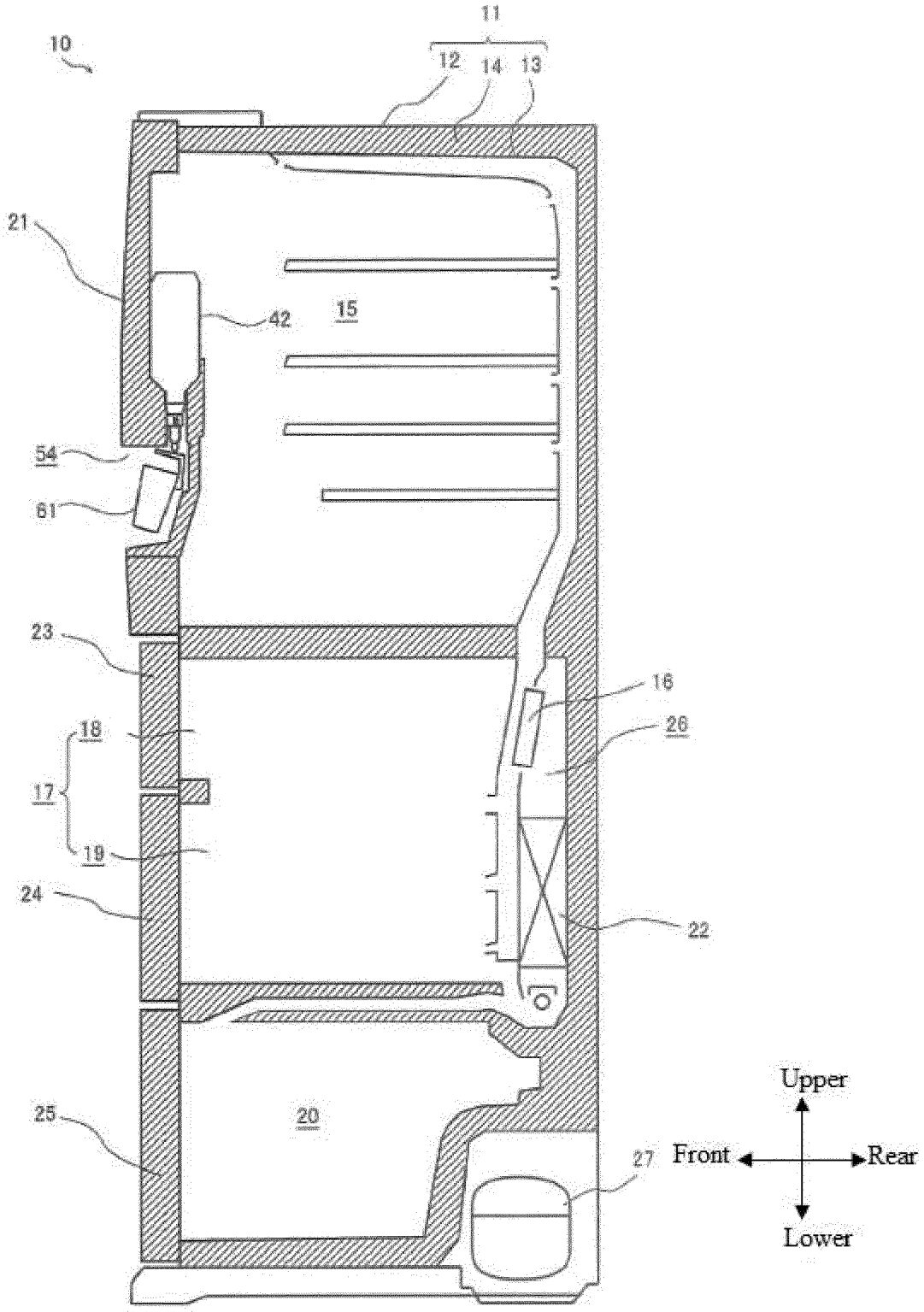


FIG. 1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27
Upper
Front
Rear
Lower

FIG. 2

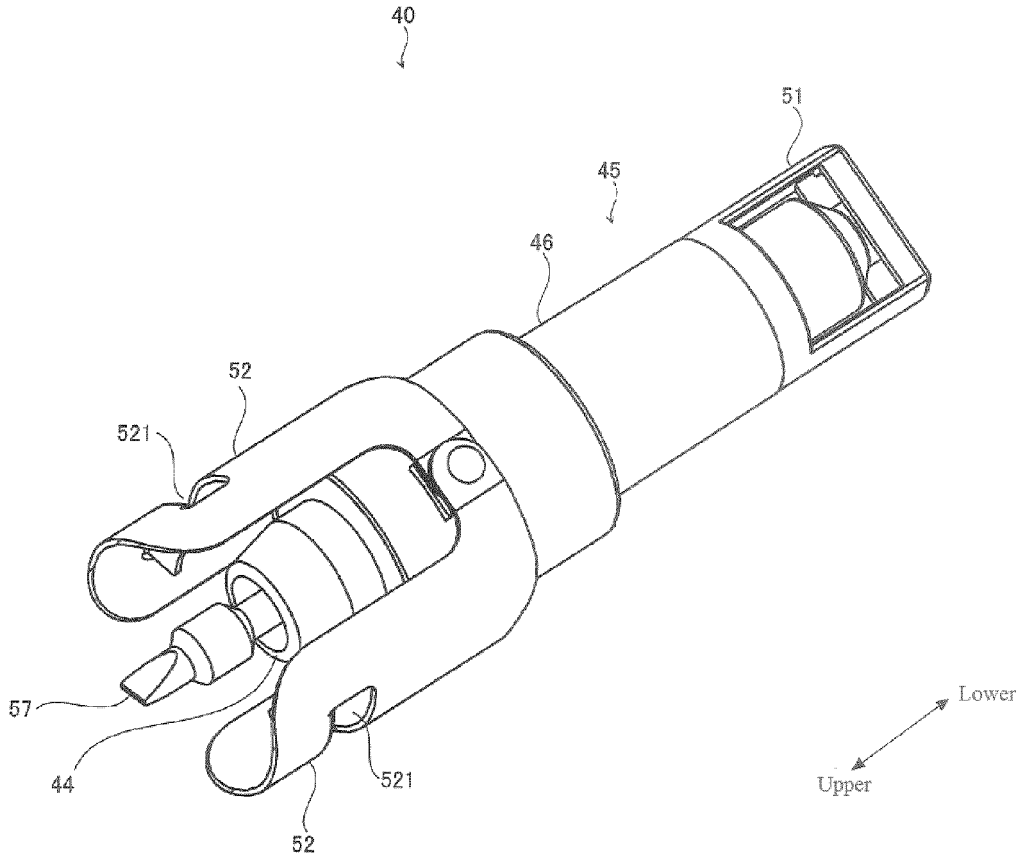


FIG. 3

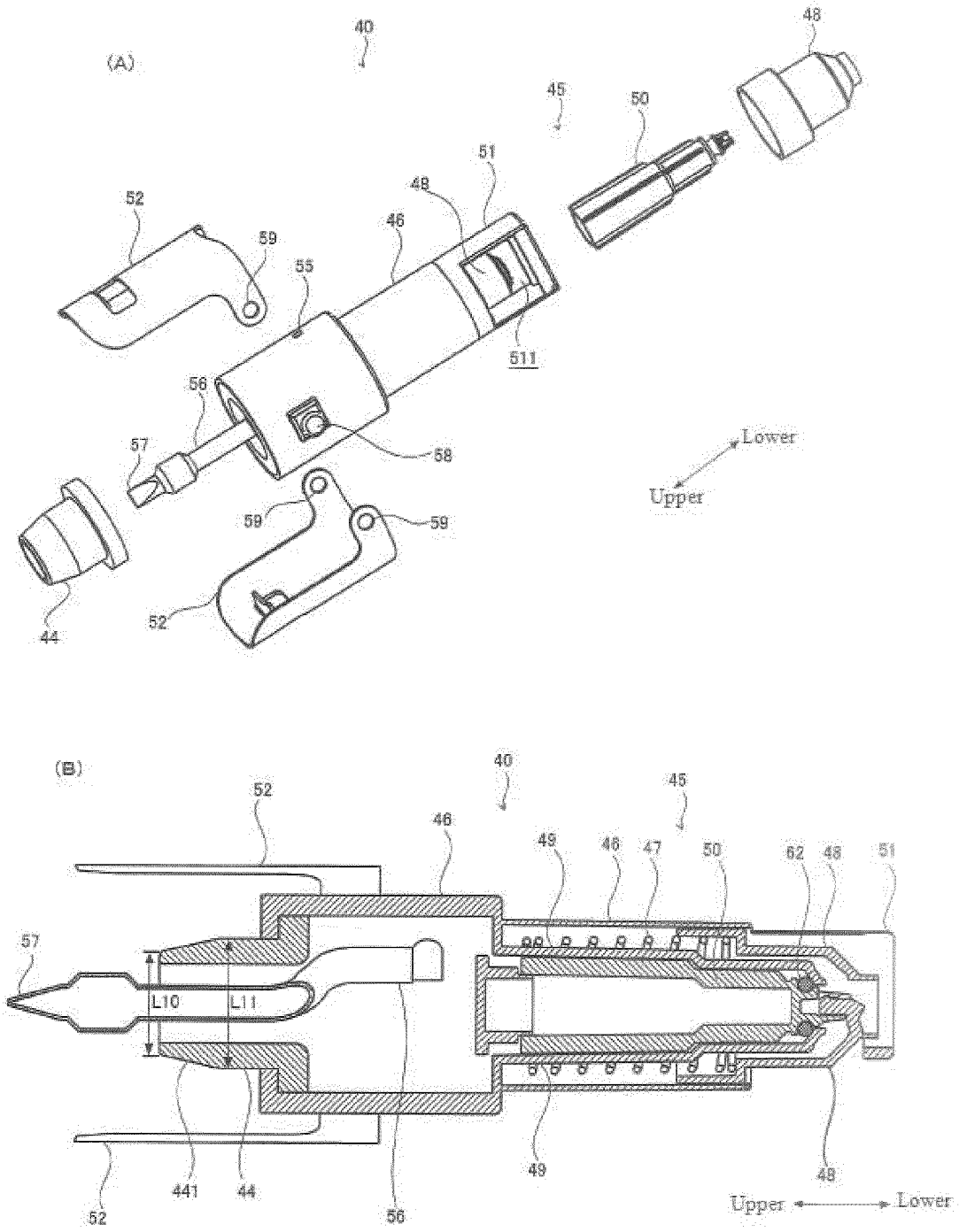
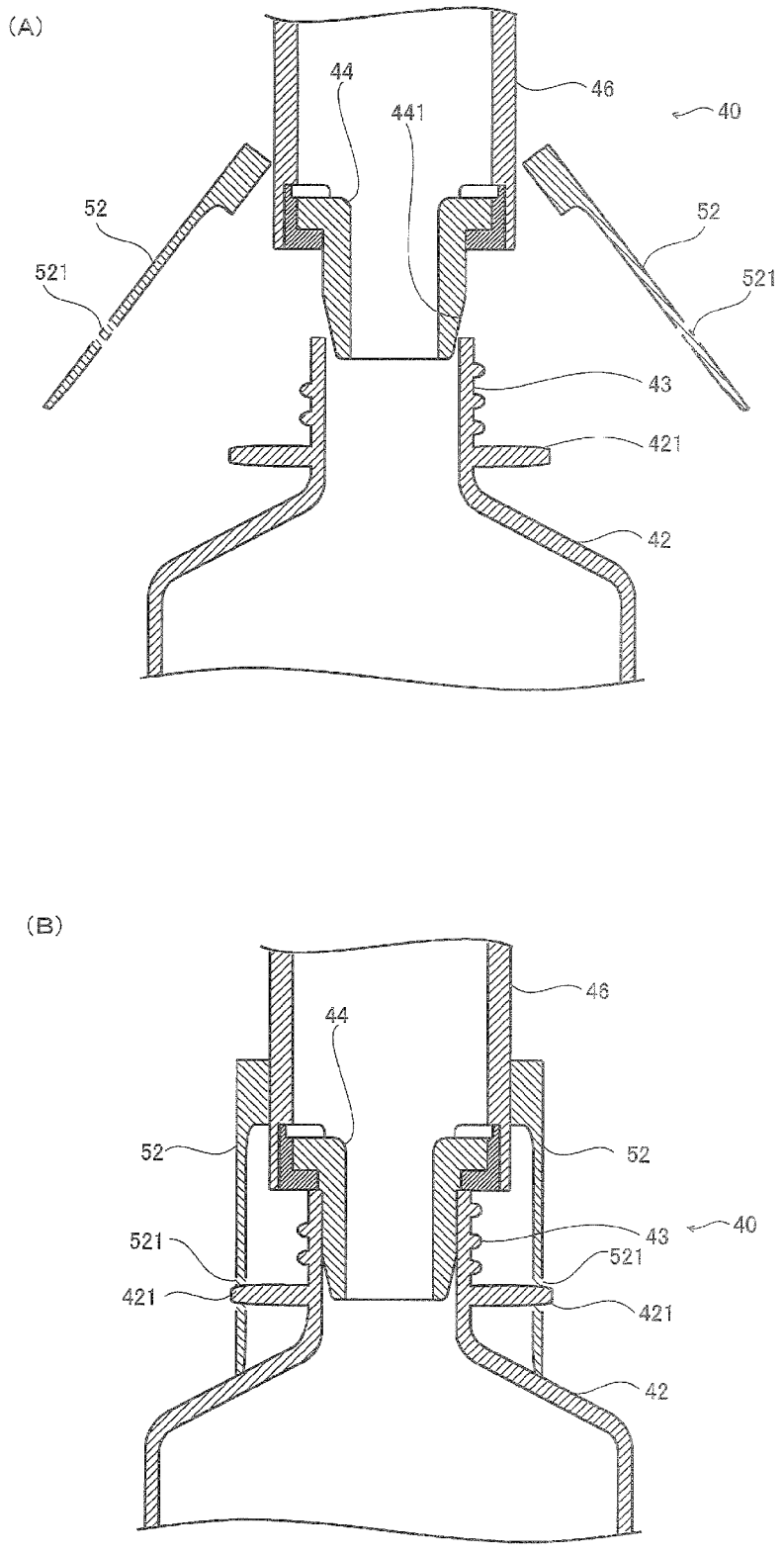

(A)
40
48
45
50
51
52
59
46
48
55
511
56
57
58
59
59
52
44
Lower
Upper
(B)
40
52
45
46
49
46
47
50
62
48
51
57
L10
L11
441
44
56
49
48
52
Upper
Lower

FIG. 4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(B)
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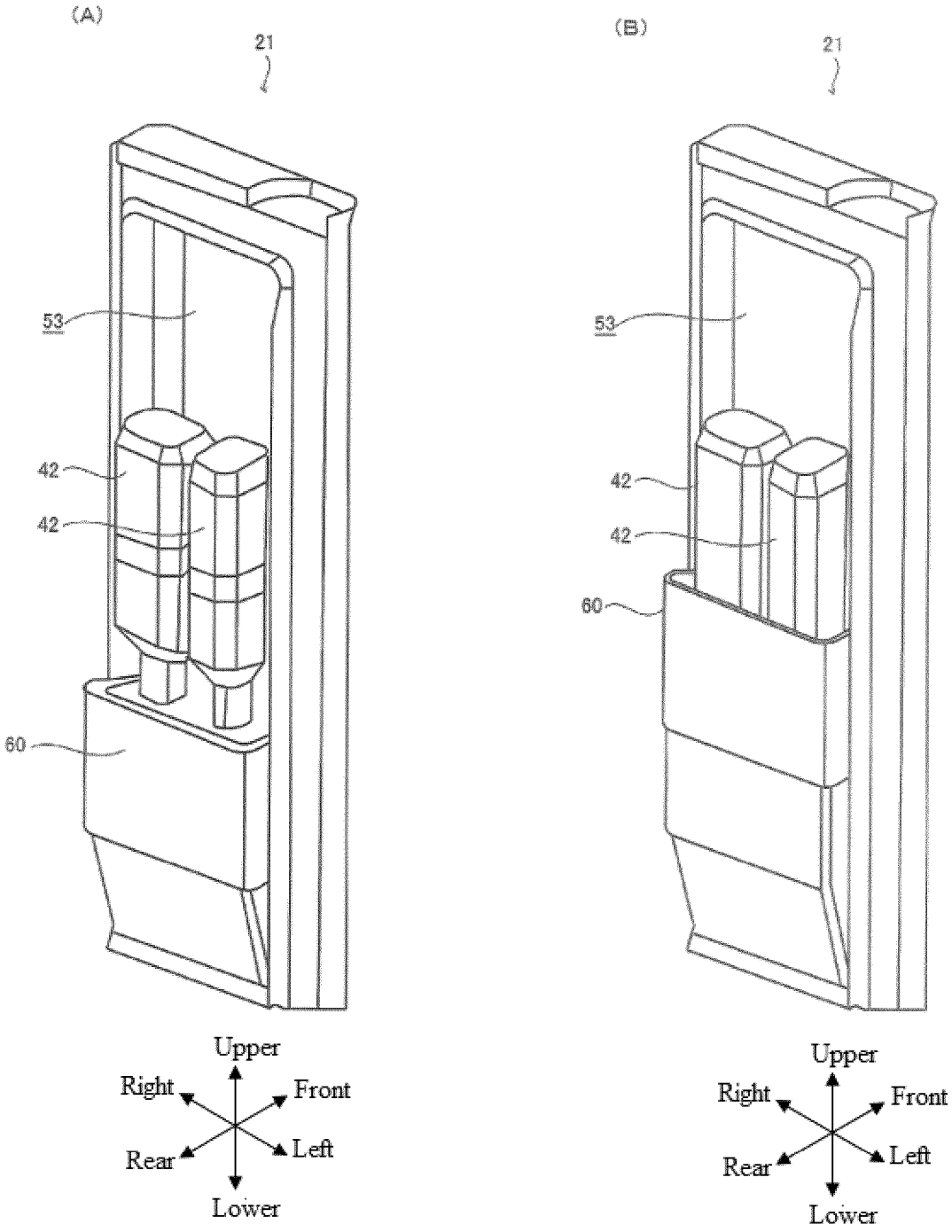
521
421
421
42

FIG. 5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42
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Upper
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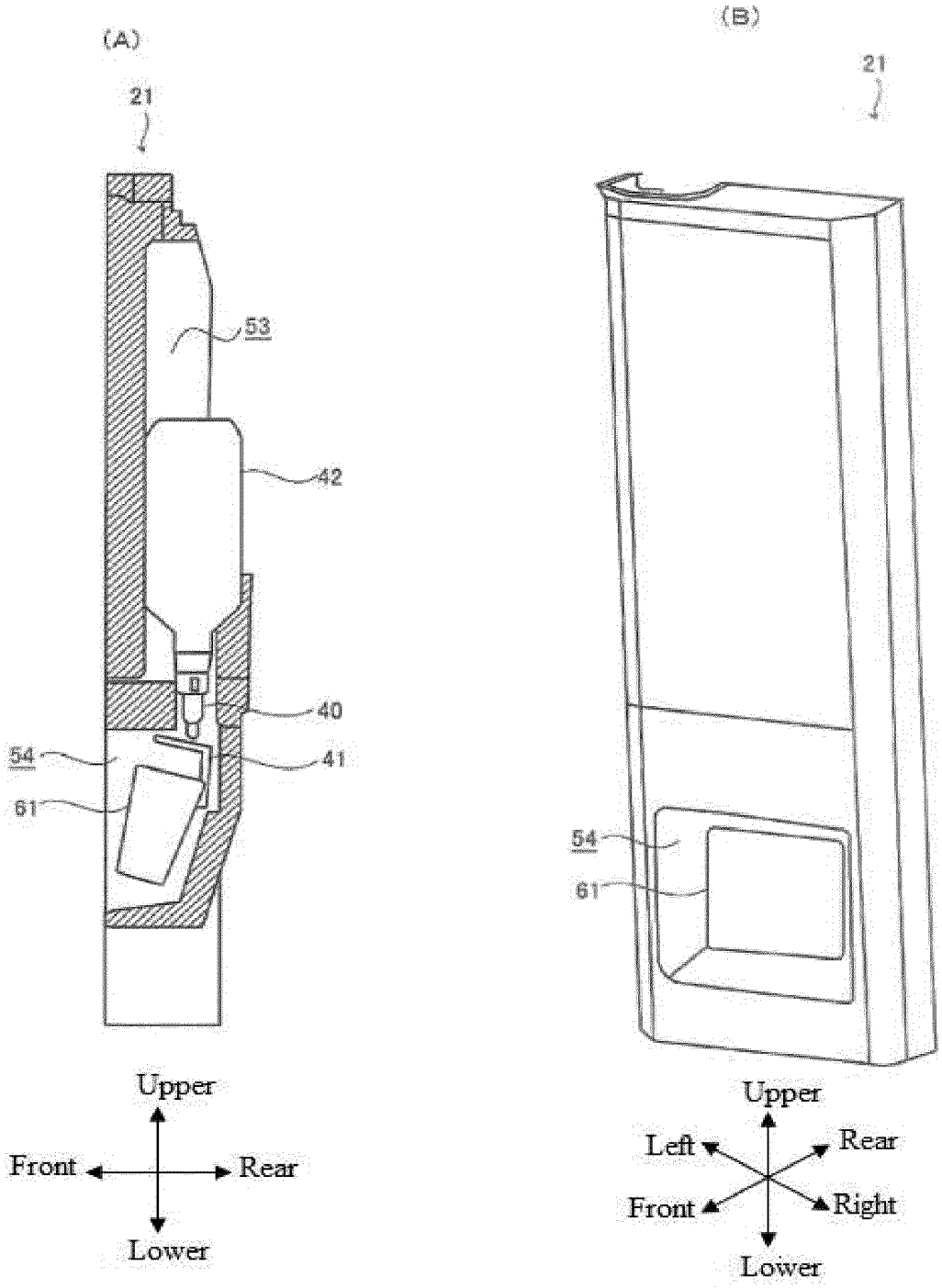
Front
Rear
Left
Lower

FIG. 6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Rear
Lower
(B)
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Upper
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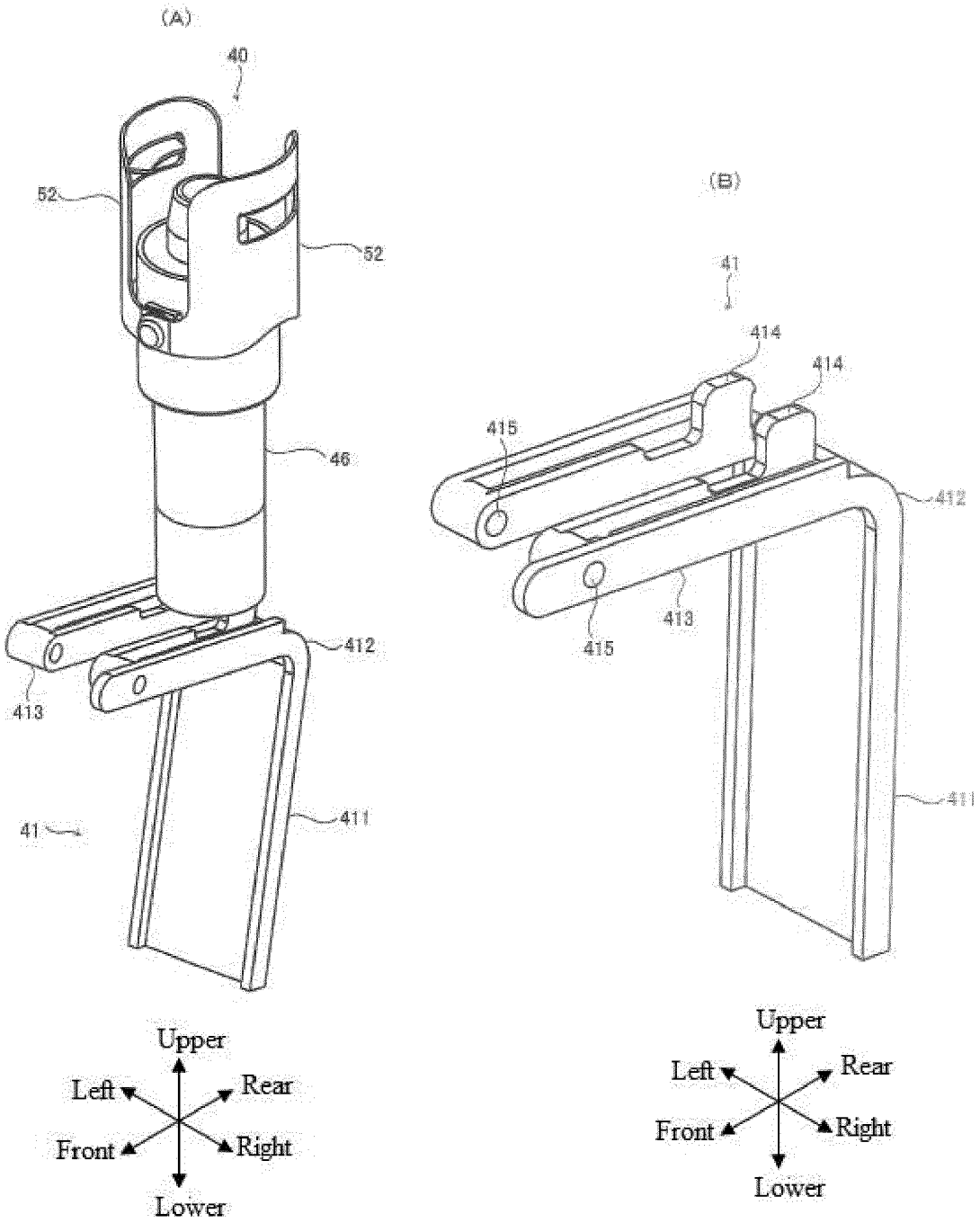
Rear
Front
Right
Lower

FIG. 7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Upper
Left
Rear
Front
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(B)
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414
414
415
412
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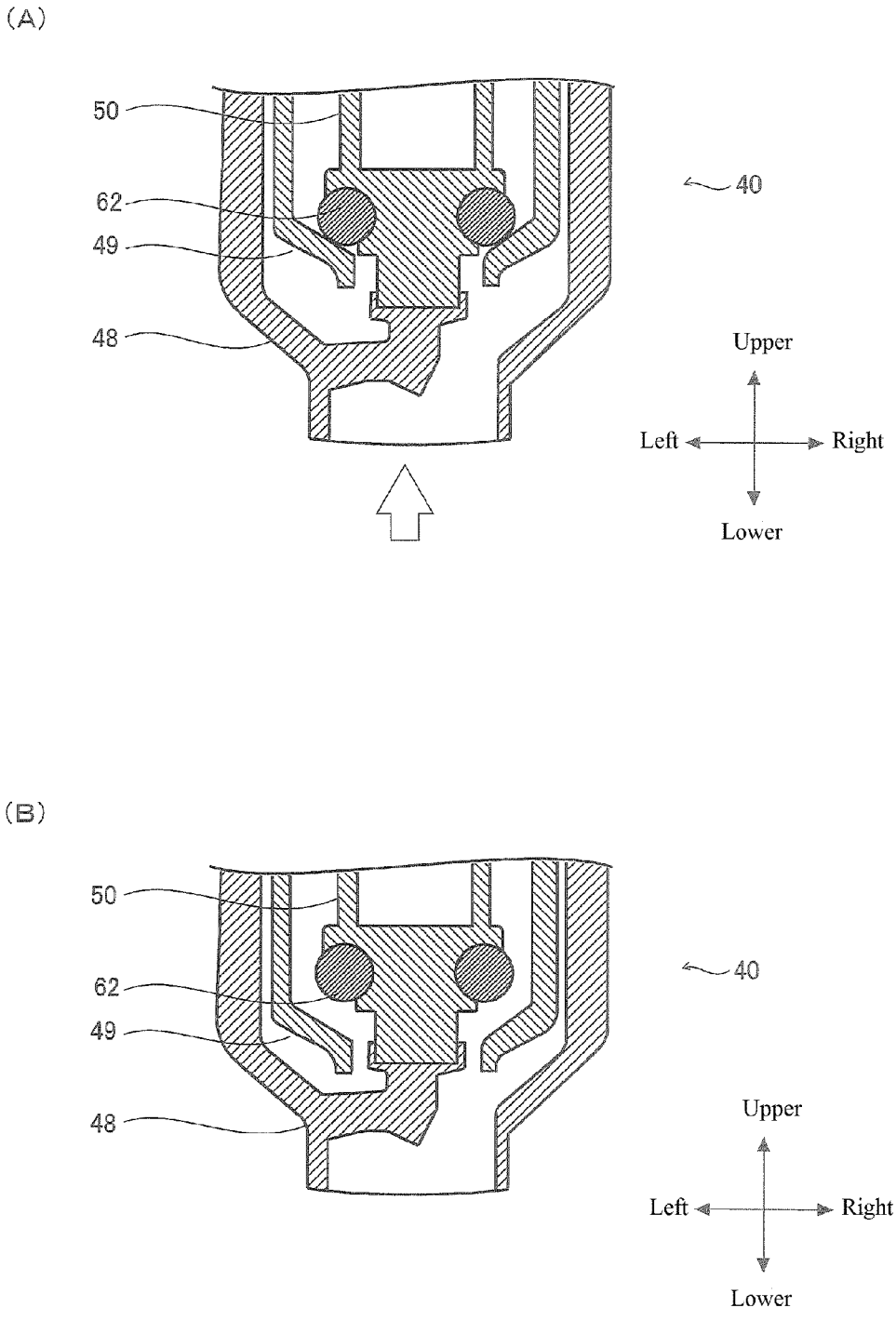
413
411
Upper
Left
Rear
Front
Right
Lower

FIG. 8


(A)
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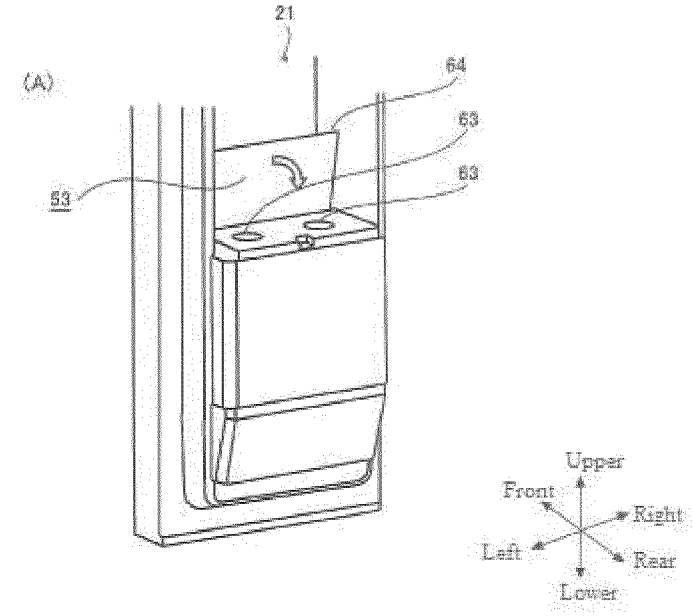
Right
Lower

FIG. 9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Rear
Lower

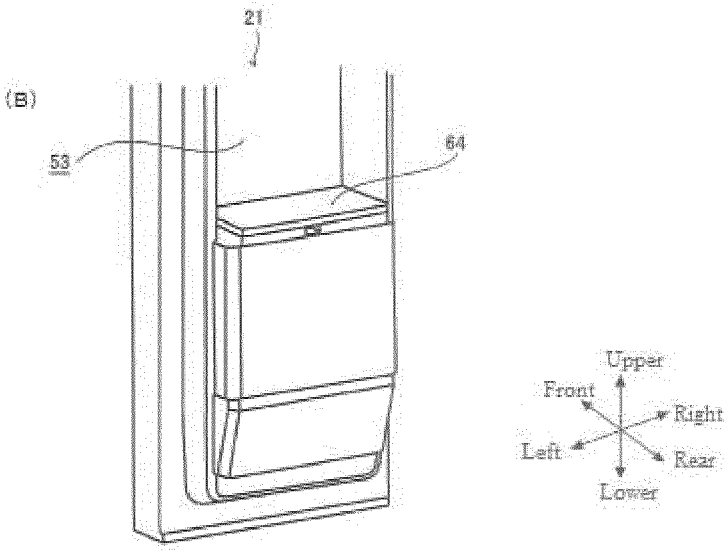
(B)
21
53
64
Upper
Front
Right
Left
Rear
Lower

FIG. 10

INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/078839

A. CLASSIFICATION OF SUBJECT MATTER

F25D 23/12(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

F25D23/12，A47J31/44，B67D3/00

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

CNABS; VEN; CNTXT; USTXT; CNKI: 海尔智家股份有限公司, 青岛海尔电冰箱有限公司, 豊嶋昌志, 加藤直树, 冰箱, 饮水机, 阀, 连接, 调节, 外径, 尺寸, 小, 密封, refrigerator, water dispenser, valve?, connect+, adjust+, outside, inner, diameter, size, small, seal+

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 106257218 A (DONGBU DAEWOO ELECTRONICS CORPORATION) 28 December 2016 (2016-12-28) description, paragraphs [0003]-[0068] and figures 1-7	1-11
A	CN 105008265 A (KABUSHIKI KAISHA COSMO LIFE) 28 October 2015 (2015-10-28) entire document	1-11
A	CN 101261066 A (TAIZHOU LG ELECTRONICS REFRIGERATOR CO., LTD.) 10 September 2008 (2008-09-10) entire document	1-11
A	US 2014312066 A1 (COCA COLA CO.) 23 October 2014 (2014-10-23) entire document	1-11
A	EP 2641864 A3 (INDESIT COMPANY S.P.A.) 20 November 2013 (2013-11-20) entire document	1-11
A	US 5791523 A (SAMSUNG ELECTRONICS CO., LTD.) 11 August 1998 (1998-08-11) entire document	1-11

☐ Further documents are listed in the continuation of Box C. ☑ See patent family annex.

* Special categories of cited documents:
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"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
07 May 2021	**12 May 2021**
Name and mailing address of the ISA/CN **China National Intellectual Property Administration (ISA/CN)** **No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088** **China** Facsimile No. **(86-10)62019451**	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.
PCT/CN2021/078839

Patent document cited in search report			Publication date (day/month/year)	Patent family member(s)			Publication date (day/month/year)
CN	106257218	A	28 December 2016	KR	20160149413	A	28 December 2016
				US	2016368756	A1	22 December 2016
				US	9828229	B2	28 November 2017
CN	105008265	A	28 October 2015	KR	20150127109	A	16 November 2015
				EP	2966026	A1	13 January 2016
				US	2016002020	A1	07 January 2016
				JP	2014169109	A	18 September 2014
				JP	5529311	B1	25 June 2014
				EP	2966026	A4	27 July 2016
				CN	105008265	B	10 April 2018
				WO	2014136332	A1	12 September 2014
				TW	I624631	B	21 May 2018
				TW	201435279	A	16 September 2014
				KR	102086880	B1	09 March 2020
				US	9440840	B2	13 September 2016
CN	101261066	A	10 September 2008	None			
US	2014312066	A1	23 October 2014	US	8800817	B2	12 August 2014
				WO	2012078604	A1	14 June 2012
				CN	106901606	B	15 May 2020
				RU	2013129006	A	20 January 2015
				JP	2014500206	A	09 January 2014
				CN	106901606	A	30 June 2017
				CO	6721042	A2	31 July 2013
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				SG	191035	A1	31 July 2013
				EP	2648580	A1	16 October 2013
				AR	084179	A1	24 April 2013
				CN	103429129	A	04 December 2013
				EP	2648580	A4	06 August 2014
				EC	SP13012738	A	30 September 2013
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				US	2012138635	A1	07 June 2012
EP	2641864	A3	20 November 2013	ES	2535131	T3	05 May 2015
				EP	2896593	A2	22 July 2015
				EP	2896593	A3	07 October 2015
				EP	2641864	B1	21 January 2015
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				EP	2641864	A2	25 September 2013
US	5791523	A	11 August 1998	KR	970047541	A	26 July 1997
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				CN	1156813	A	13 August 1997
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				JP	H09189482	A	22 July 1997
				EP	0780644	A3	28 January 1998
				KR	100187284	B1	01 May 1999

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 2017036061 A **[0002]**