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(54) **REFRIGERATION APPLIANCE AND MANUFACTURING METHOD THEREOF**

KÜHLGERÄT UND DESSEN HERSTELLUNGSMETHODE

APPAREIL DE RÉFRIGÉRATION ET SON PROCÉDÉ DE FABRICATION

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(56) References cited:
DE-A1-102005 057 161 DE-A1-102006 018 204
DE-A1-102006 040 358

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Description

Technical Field

[0001] The invention relates to a refrigeration appliance and its manufacturing method, especially to a household or commercial refrigeration appliance having a dispenser and a manufacturing method thereof.

Background Art

[0002] CN 101071026 discloses a refrigeration appliance which is provided with a dispenser in its door. In this refrigeration appliance, a front panel of the door is formed with an opening for mounting the dispenser. The dispenser has a dispenser casing which defines an inner cavity. The dispenser casing is provided along the opening of the door so that the inner cavity corresponds to the opening. A user may put an outside container such as a cup into the inner cavity to receive ice or water stored in the refrigeration appliance. The dispenser casing comprises a cavity rim which is provided at the front end of the inner cavity and is substantially parallel with the front panel. The cavity rim has a shape that corresponds to the opening of the front panel and a width and a length which are larger than that of the opening. When assembling, the dispenser casing is inserted into the opening of the front panel from front side to back side. After assembling, the back surface of the cavity rim is attached to the front surface of the front panel and is thus exposed on the front surface of the door, and a gap between the cavity rim and the front panel is also exposed to outside. In order to cover the gap which is generally significantly uneven, the refrigeration appliance is additionally provided with a frame which is arranged along the opening to cover the cavity rim which otherwise will be outwardly exposed, to obtain an appearance which is even and smooth. Meanwhile, a display and control unit is attached to an upper portion of the frame and thus is connected to the door together with the frame.

[0003] KR 2006-006246 discloses a dispenser casing structure of another refrigeration appliance. The dispenser casing is formed at an end of its inner cavity with a slot which is parallel to a front panel of a door. An edge of the front panel is inserted into the slot for mounting an opening of the dispenser, so as to form a relatively close engagement between the dispenser casing and the front panel and prevent any leakage of foams which may be occurred in a foaming process. However, for an opening having a closed loop edge, the connection between the dispenser casing and the opening cannot be easily achieved by this structure, and the front surface of the dispenser casing (the front side wall of the slot) is inevitably exposed to the outside of the front panel.

[0004] DE 10 2006 018 204 A1 describes a refrigerator comprising a housing and a dispensing device for flowable and/or pourable chilled material, said dispensing device being located in a front recess of the housing. The

front of the housing is covered at least in part by an adjustable decorative plate. The recess is accessible through a hole in the decorative plate while a case that is open towards the dispensing device and the hole of the decorative plate is adjustably mounted in the recess.

[0005] DE 10 2005 057 161 A1 describes a refrigerating appliance with a delivery device on a front side of the casing for free-flowing or loose refrigerated products and has a sleeve through which the delivery device is accessible and which projects from the front side and is encompassed by an encircling frame which projects from the sleeve. The frame is elastically compressible. The frame and the front side define a slot which extends around the sleeve. The sleeve is compressible in its longitudinal direction. DE 10 2006 018 204 A1 and DE 10 2005 057 161 A1 both disclose a refrigeration appliance according to the preamble of claim 1.

[0006] DE 10 2006 040 358 A1 describes a built-in refrigerator comprising a housing with a front dispenser opening and a frame piece for lining an opening in a decorative plate cladding the front side, lying in front of the dispenser opening. The frame piece is made up of a cover piece lying over the edges of the opening and an inner sleeve arranged between the cover piece and the front side.

Summary of the Invention

[0007] Therefore, an object of the invention is to solve at least one of the technical problems found in the prior art so that the refrigeration appliance prevents leakage of a foaming agent from a gap between the door panel and a cavity rim during a foaming process.

[0008] The invention in one aspect relates to a refrigeration appliance as defined in claim 1.

[0009] The dispenser casing does not extend beyond the portion of the front surface of the door panel; rather, it lies behind the door panel as a whole. In this way, no extra trimming frame is needed, and thus the number of assembled parts, material usage and maintenance cost of the door can be reduced. In addition, the door may have an appearance with higher smoothness and evenness.

[0010] Other features which are disclosed individually or in combination as features of the invention are defined in attached claims.

[0011] According to the invention, the dispenser casing comprises a cavity rim provided along the front end of the inner cavity, the cavity rim being connected with the back surface of the door panel. Thus, the dispenser casing may form a stable connection with the door panel by means of the cavity rim, and meanwhile, the cavity rim is not exposed to the front surface of the door panel.

[0012] According to the invention, the door further comprises sealing means arranged between the back surface of the door panel and the cavity rim. This may help to significantly reduce the chance of leakage of a foaming agent from a gap between the door panel and the cavity

rim during a foaming process. According to a particularly preferred embodiment of the invention, the sealing means forms a closed loop structure along the edge of the opening. Particularly preferably, the sealing means is an adhesive tape.

[0013] According to a preferred embodiment of the invention, the door panel comprises an extension extending backwardly from the edge of the opening. Thus, the extension extended in a front-back direction helps to prevent releasing of foaming agent from the opening during a foaming process.

[0014] According to a preferred embodiment of the invention, the extension comprises a flange which is bent backwardly from the edge of the opening. This will prevent the door panel from having a complex structure, and particularly benefits the manufacturing process so as to reduce manufacturing cost.

[0015] In a particularly preferred embodiment, the extension is provided along the whole edge of the opening. The extension which forms a closed loop further benefits quality control in a foaming process.

[0016] In a particularly preferred embodiment, the extension lies at least substantially perpendicular to a plane in which the opening lies. This not only helps to prevent leakage of foaming agent during a foaming process, but also benefits the mating of the extension and the connection part, which renders manufacture easier.

[0017] In a particularly preferred embodiment, the extension lies outside the inner cavity so that the extension may not be exposed inside the inner cavity, which helps to avoid any negative influence of the extension to the appearance of the dispenser.

[0018] According to a preferred embodiment of the invention, the dispenser casing comprises a connection part configured for connecting with the extension, the extension and the connection part forming a plug-in connection. The plug-in connection not only helps to prevent leakage of foaming agent, but also achieves a convenient connection between the two parts. In a particularly preferred embodiment, the connection part comprises a slot configured for mating with the extension.

[0019] According to a preferred embodiment of the invention, the dispenser casing comprises a cavity wall which defines the inner cavity, the slot being formed in the cavity wall and being separated with the inner cavity.

[0020] According to a preferred embodiment of the invention, the slot has an open inserting end facing toward the opening. This not only benefits manufacture, but also helps easy insertion of the extension into the slot.

[0021] According to a preferred embodiment of the invention, the extension comprises a hook, and the connection part comprises a locking part configured for connecting with the hook to prevent the dispenser casing from detached in a front-back direction from the door panel. Thus, the dispenser casing and the door panel may be fixed to each other with a higher reliability.

[0022] In an embodiment, the door panel forms the front surface of the door.

[0023] However, in an alternative embodiment, the door further comprises a front panel, the front panel being closely near the door panel and having a front opening corresponding to the opening, and the front panel forming at least a major portion the front surface of the door. The front panel is preferably formed of glass.

[0024] Preferably, the refrigeration appliance further comprises a sealing strip provided between the front panel and the door panel along the edge of the opening. Advantageously, the sealing strip forms a closed loop structure around the opening.

[0025] According to a preferred embodiment of the invention, the refrigeration appliance further comprises a control panel which is at least partly received in the opening.

[0026] Another aspect of the invention relates to a method for manufacturing a refrigeration appliance as defined in claim 19.

[0027] According to a preferred embodiment of the invention, in step a), the door panel is formed with an extension which extends backwardly from the edge of the opening.

[0028] According to a preferred embodiment of the invention, the dispenser casing comprises a slot configured for mating with the extension, and the extension is inserted into the slot in step c). According to a preferred embodiment of the invention, the front surface of the cavity rim of the dispenser casing is connected to the back surface of the door panel in step d).

[0029] Other objects and advantages of the invention will be apparent from the description to the preferred embodiments with reference to the drawings.

Brief Description of the Drawings

[0030] The invention will be further understood by reading the following detailed description with reference to the drawings which illustrate the invention and in which,

Figure 1 is a schematic perspective view of a refrigeration appliance according to a preferred embodiment of the invention.

Figure 2 is a schematic perspective view of a door of the refrigeration appliance according to a preferred embodiment of the invention, wherein a control panel is removed from the door.

Figure 3 is a schematic partial sectional view taken along line I-I of Figure 1.

Figure 4 is a schematic enlarged view of portion "A" of Figure 3.

Figure 5 is a partial perspective view showing a door panel and a dispenser casing, which are separated from each other, according to a preferred embodiment of the invention.

Figures 6 and 7 are schematic partial enlarged views of portion "B" and portion "C" of Figure 5 respectively.

Figure 8 is a schematic partial sectional view of a door according to another preferred embodiment of

the invention.

Figure 9 is a schematic partial sectional view of a door according to yet another preferred embodiment of the invention.

Detailed Description of Preferred Embodiments

[0031] Figure 1 is a perspective view of a refrigeration appliance 1 according to a preferred embodiment of the invention. As shown in Figure 1, the refrigeration appliance 1 comprises a refrigerator body 2. In this embodiment, the refrigerator body 2 defines a plurality of storage compartments 26 (see Figure 3) including a freezing compartment and a refrigerating compartment arranged in parallel and separated by a separation plate (not shown) with each other.

[0032] The refrigeration appliance 1 comprises two doors 3 corresponding to the storage compartments 26 respectively. Each of the doors 3 is pivotably connected with a corresponding side of the refrigerator body 2 by means of a hinge 19 and is rotatable around a rotation axis which is parallel to a vertical axis. In ordinary condition, the door 3 is closed to prevent cold air from leaving the storage compartments 26. When needed, a user may open a corresponding one of the doors 3 for performing operation such as taking out food from the freezing compartment or the refrigerating compartment or putting food into one of the storage compartments 26. The user may perform opening and closing operation to the door 3 by means of a handle 18.

[0033] In this embodiment, each of the doors 3 is configured to completely open or completely close a corresponding one of the storage compartments 26. It can be understood that the invention is not limited thereto, and other embodiments are also possible. For example, in an alternative embodiment, one of the storage compartments 26 may be opened or closed by two doors 3. That is to say, each door 3 may only open or close a portion of such a storage compartment 26.

[0034] One of the doors 3 of the refrigeration appliance 1 is provided with a dispenser 6 so that the user may obtain ice and / or beverage, such as ice stored in the freezing compartment and water stored in a water tank provided inside the refrigerating compartment, without opening the door 3. In this embodiment, the dispenser 6 is provided in the door 3 which corresponds to the freezing compartment. By means of suitable arrangement, the dispenser 6 may alternatively or additionally be provided in the door 3 which corresponds to the refrigerating compartment 26.

[0035] The door 3 comprises a door panel 5 forming the front surface of the door 3. In this embodiment, the door panel 5 is formed of a sheet metal material. The door panel 5 has an opening 4 corresponding to the dispenser 6, the opening 4 being substantially square or rectangular. The dispenser 6 is mounted along the opening 4 and comprises a dispensing cavity 20 which is communicated with the opening 4 and is exposed to the front

surface of the door 3. An ice outlet (not shown) and a water outlet (not shown) are formed above the dispensing cavity 20. The dispensing cavity 20 is recessed backwardly from the front surface of the door 3 to a predetermined depth and is configured to receive at least a portion of an outside container, such as a cup.

[0036] Figure 2 shows a schematic partial exploded view of the door 3 according to a preferred embodiment of the invention. As shown in Figures 1 and 2, the refrigeration appliance 1 comprises a control panel 17 provided in the door 3. The control panel 17 is arranged along an upper end of the opening 4 and is received in the opening 4. In this embodiment, the front panel of the control panel 17 is flush with the front surface of the door panel 5.

[0037] The control panel 17 is located above and closely near the dispensing cavity 20. The control panel 17 comprises a display screen 21 and a plurality of switching devices 22. The display screen 21 may display information such as the state of the refrigeration appliance 1 and / or optional parameters and the like.

[0038] The switching devices 22 are located below the display screen 21 and thus are closer to the dispensing cavity 20 than the display screen 21. In this embodiment, by operating the switching devices 22, the user may select operations such as loading water, loading pieces of ice, supplying pieces of ice and swathing on a lighting device (not shown) for illuminating the dispensing cavity 20.

[0039] It can be seen from Figures 1 and 2 that the dispenser 6 as a whole does not extend beyond the front surface of the door panel 5 (or the front surface of the door 3 in this embodiment). Rather, it is located backward from the door panel 5.

[0040] Figure 3 shows a schematic partial sectional view of the door 3 according to a preferred embodiment of the invention. As shown in Figure 3, an ice containing unit 25 is provided inside the storage compartments 26, with the front portion of the ice containing unit 25 being provided with a downward discharge port. An ice discharging passage 27 is provided in the door 3. The ice discharging passage 27 has an inlet port toward the discharge port of the ice containing unit 25 so that the ice discharged from the ice containing unit 25 may enter into the ice discharging passage 27 and is finally discharged to the dispensing cavity 20.

[0041] The dispenser 6 comprises a dispenser casing 7 received between the door panel 5 and an inner lining 23. The inner lining 23 forms the back wall of the door 3 and faces the storage compartments 26 when the door 3 is closed. The inner lining 23 protrudes toward the storage compartments 26 at the location corresponded to the dispenser casing 7, with the dispenser casing 7 being separated from the protrusion portion of the inner lining 23 by a predetermined distance.

[0042] A heat insulation layer 24 is arranged between the door panel 5 and the inner lining 23 and between the dispenser casing 7 and the inner lining 23 for reducing the release of cold energy of the storage compartments

26. The heat insulation layer 24 is formed by foaming an insulating foam material.

[0043] The dispenser casing 7 is formed with an inner cavity 8 which is recessed inwardly and has an open front end. The dispenser 6 comprises a separation plate 30 (not shown in Figure 2) which separates the inner cavity 8 into an upper part and a lower part. The part of the inner cavity 8 which is located under the separation plate 30 forms the dispensing cavity 20 having a front end which is always open. The separation plate 30 is provided with the ice outlet and the water outlet. Ice and water are discharged from their corresponding outlets to an outside container located inside the dispensing cavity 20.

[0044] The dispensing cavity 20 has a supporting wall 28 which is substantially flat so that the outside container may be stably put onto it. The supporting wall 28 has a plurality of thin through holes (not shown) through which any liquid that is splashed or outflow in an ice or water dispensing process may flow into a water gathering slot 29 located under the supporting wall 28.

[0045] The upper portion of the opening 4 which lies above the separation plate 30 is adapted to conform the out profile of the control panel 17 so that the control panel 17 engages corresponding edges of the opening 4 and closes the upper portion of the opening 4 which lies above the separation plate 30.

[0046] Figure 4 is a partial enlarged view of portion "A" of Figure 3. Figure 5 shows a schematic partial perspective view of the dispenser casing 7 which is removed from the door panel 5. As shown in Figures 3, 4 and 5, the dispenser casing 7 comprises a cavity rim 9 provided along the front end of the inner cavity 8. In this embodiment, the cavity rim 9 is provided on the whole edge of the inner cavity 8. In this embodiment, the front surface of the cavity rim 9 is located at the most forward end of the dispenser casing 7 and is parallel with the edge area of the opening 4.

[0047] The cavity rim 9 is connected to the back surface of the door panel 5. Specifically, the cavity rim 8 is connected to the back surface of the door panel 5 along the edge of the opening 4. Therefore, the cavity rim 8 is hidden behind the door panel 5, rather than exposed at the outer surface of the door 3.

[0048] The door 3 comprises an extension 11 provided along the edge of the opening 4 and extended backwardly. In this embodiment, the extension 11 is formed by a flange bending backwardly from the edge of the opening 4. The extension 11 is provided along the whole edge of the opening 4 and thus forms a closed loop structure. The length of the extension 11 in a front-back direction is preferably 2 to 4 mm, such as 3 mm.

[0049] The dispenser casing 7 comprises a connection part 12 for connecting with the extension 11. In this embodiment, the connection part 12 comprises a slot 13 for receiving the extension 11, and thus the extension 11 and the connection part 12 form a plug-in fit.

[0050] The slot 13 is provided along the front end of the dispenser casing 7. Specifically, the slot 13 extends

backwardly from a front end surface of a cavity wall 14 that defines the inner cavity 8, and thus has an open inserting end facing toward the door panel 5. As a result, the structure of the extension 11 can be formed relatively easily, and the mating of the extension and the slot can be achieved conveniently. In this embodiment, the extension 11 and the slot 13 lie perpendicular to a plane in which the opening 4 lies. The slot 13 is provided around the whole periphery of the inner cavity 8 so as to be corresponded to the extension 11.

[0051] As shown in Figure 4, the slot 13 is not exposed in the inner cavity 8; rather, it is separated from the inner cavity 8. Thus, after the extension 11 is inserted into the slot 13, the extension 11 lies outside of the inner cavity 8. In other words, since the extension 11 is not exposed inside the inner cavity 8, the influence of the extension 11 to the appearance of the dispenser 6 is reduced.

[0052] Figures 6 and 7 are schematic partial enlarged views of portion "B" and portion "C" of Figure 5 respectively. On the basis of Figure 5 and with reference to Figures 6 and 7, it can be seen that the extension 11 which is provided along the longitudinal edge of the opening 4 further comprises a plurality of first anchoring parts 31 which are arranged with predetermined separations between each other. Each of the first anchoring parts 31 is in form a flap and is formed with a hook 33 at opposite upper and lower edges respectively. Correspondingly the dispenser casing 7 comprises second anchoring parts 32 adapted for mating with the first anchoring parts 31. The second anchoring parts 32 comprises locking blocks 34 corresponding to the hooks 33. The second anchoring parts 32 extend backwardly from the slot 13 so as to be exposed outside the cavity wall 14. When the first anchoring parts 31 are anchored to the second anchoring parts 32, the hooks 33 are retained by the locking blocks 34 to prevent the dispenser casing 7 from detached from the door panel 5 in the front-back direction.

[0053] Figure 8 schematically shows a partial sectional view of a door according to another embodiment of the invention. The embodiment shown in Figure 8 is different from the former embodiment in that it shows the sealing means 10 which, according to the invention, is disposed between the back surface of the door panel 5 and the front surface of the cavity rim 9. In this embodiment, the whole periphery of the cavity rim 9 is provided with the sealing means 10 so that the sealing means 10 forms a closed loop, which more effectively prevents leakage of foaming agent during a foaming process.

[0054] The sealing means 10 may be formed by an adhesive tape, such as a single-sided adhesive tape which is to be affixed to the cavity rim 9 or the door panel 5. Particularly advantageously, the sealing means 10 is a double-sided adhesive tape which may not only prevent leakage of foaming agent during a foaming process but also has a function of fixing the door panel 5 and the cavity rim 9 together. When affixing means having adhesive force strong enough is used, it is possible to fix the dispenser casing 7 and the door panel 5 only by or mainly

by the affixing means.

[0055] Figure 9 schematically shows a partial sectional view of a door 3 according to yet another preferred embodiment of the invention. The embodiment shown in Figure 9 is different from the former embodiments mainly in that the door 3 further comprises a front panel 15 located in front of the door panel 5. The front panel 15 covers at least a major portion of the door panel 5 so as to form the front surface of the door 3. The front panel 15 is preferably formed of glass and completely covers the door panel 5.

[0056] The front panel 15 is provided closely near the door panel 5. The front panel 15 may be connected with the door panel 5 by means of such as an adhesive tape arranged along the edge area of the front panel 15, or may be fixed to the door 3 by means of slits provided in a longitudinal direction at opposites of the door 3 and configured for receiving longitudinal edges of the front panel 15.

[0057] The front panel 15 has a front opening 16 corresponding to the opening 4. The shape and size of the front opening 16 may be the same as that of the opening 4. The door 3 comprises sealing strips 35 which are arranged between the front panel 15 and the door panel 5 as well as along the opening 4 and / or the edge of the front opening 16 to prevent outside air from entering into a gap between the front panel 15 and the door panel 5 from the opening 4 and the front opening 16, which otherwise will form such as fog or condensation on the backside of the front panel 15. The sealing strip 35 forms a closed loop structure around the opening 4. In a most convenient and effective embodiment, the sealing strip 35 is an adhesive tape.

[0058] Now a method for manufacturing refrigeration appliance according to a preferred embodiment of the invention will be described.

[0059] The manufacturing of the refrigeration appliance 1 mainly comprises: 1) providing a refrigerator body 2, wherein the refrigerator body 2 defines at least one storage compartment 26; 2) providing a door 3 for the refrigeration appliance 1; and 3) connecting the door 3 to the refrigerator body 2.

[0060] Any methods known in the art may be used for providing the refrigerator body 2 and connecting the door 3 to the refrigerator body 2 and will not be described in details. Only a method for forming the door will be described.

[0061] First, a door panel 5 having an opening 4 is provided. The door panel 5 is preferably formed of a sheet metal material. The opening 4 may be formed by means of stamping. Then the opening 4 is processed so that the edges of the opening 4 form backwardly extending flanges. The flanges are substantially perpendicular to the door panel 5.

[0062] Then, a door frame is formed with the door panel 5 as a main body. In a preferred embodiment, upper and lower edge covers 36 and right and left edge covers which form the periphery of the door 3 are connected to upper

and lower the edges and right and left the edges of the door panel 5 respectively to form the door frame. Alternatively, opposite longitudinal ends of the door panel 5 are bent backwardly to form longitudinal side walls 37 of the door 3, and the upper and lower edge cover 36 are connected to the upper and lower end surfaces of the door panel 5 to form upper and lower boundaries of the door frame.

[0063] Then, a previously prepared dispenser casing 7 is connected to the door panel 5 from the backside of the door panel 5. The dispenser casing 7 is formed with a slot 13 in the front end of the cavity wall 14, the slot 13 having a forward open inserting end. When assembling, the slot 13 of the dispenser casing 7 is aligned with the flange of the opening 4, and then the dispenser casing 7 is pushed forward so that the flange is inserted into the slot 13. Finally, the cavity rim 9 abuts against the back surface of the edge area of the opening 4 so that the dispenser casing 7 does not extend beyond the front surface of the door panel 5; rather, it is wholly behind the door panel 5. Preferably, before connecting the dispenser casing 7 to the door panel 5, a single-sided or double-sided adhesive tape is arranged onto the door panel 5 or the cavity rim 9.

[0064] Then, after an insulative foam material is injected into the assembled door frame, the inner lining 23 closes the open end of the door frame. Since the edge of the opening 4 has a flange extended in a front-back direction and the flange is inserted into the slot 13 of the dispenser casing 7, the chance of the foams exiting along the gap between the cavity rim 9 and the door panel 5 during a foaming process is significantly reduced. After the foaming process, the control panel 17 is mounted into the opening 4 from the front side of the door 3.

Claims

1. A refrigeration appliance (1), comprising:

a door (3), the door (3) comprising a door panel (5) having an opening (4); and
a dispenser (6) provided in the door (3), the dispenser (6) comprising a dispenser casing (7), the dispenser casing (7) being connected with the door panel (5) and defining an inner cavity (8) which corresponds to the opening (4), and at least a portion of the inner cavity (8) being configured to receive an outside container; and the dispenser casing (7) comprising a cavity rim (9) provided along a front end of the inner cavity (8), the cavity rim (9) being connected with the back surface of the door panel (5);
wherein the dispenser casing (7) as a whole does not extend beyond the front surface of the door panel (5);

characterized in that the door (3) further comprises sealing means (10) arranged between the

- back surface of the door panel (5) and the cavity rim (9).
2. The refrigeration appliance (1) of claim 1, **characterized in that** the sealing means (10) forms a closed loop structure along the edge of the opening (4). 5
 3. The refrigeration appliance (1) of claim 1 or 2, **characterized in that** the sealing means (10) comprises an adhesive tape. 10
 4. The refrigeration appliance (1) of any one of preceding claims, **characterized in that** the door panel (5) comprises an extension (11) extending backwardly from the edge of the opening (4). 15
 5. The refrigeration appliance (1) of claim 4, **characterized in that** the extension (11) comprises a flange which is bent backwardly from the edge of the opening (4). 20
 6. The refrigeration appliance (1) of claim 4 or 5, **characterized in that** the extension (11) is provided along the whole edge of the opening (4). 25
 7. The refrigeration appliance (1) of any one of claims 4 to 6, **characterized in that** the extension (11) lies at least substantially perpendicular to a plane in which the opening (4) lies. 30
 8. The refrigeration appliance (1) of any one of claim 4 to 7, **characterized in that** the extension (11) lies outside the inner cavity (8). 35
 9. The refrigeration appliance (1) of any one of claim 4 to 8, **characterized in that** the dispenser casing (7) comprises a connection part (12) configured for connecting with the extension (11), the extension (11) and the connection part (12) forming a plug-in connection. 40
 10. The refrigeration appliance (1) of claim 9, **characterized in that** the connection part (12) comprises a slot (13) configured for mating with the extension (11). 45
 11. The refrigeration appliance (1) of claim 10, **characterized in that** the dispenser casing (7) comprises a cavity wall (14) which defines the inner cavity (8), the slot (13) being formed in the cavity wall (14) and being separated with the inner cavity (8). 50
 12. The refrigeration appliance (1) of claim 10 or 11, **characterized in that** the slot (13) has an open inserting end facing toward the opening (4). 55
 13. The refrigeration appliance (1) of any one of claim 9 to 12, **characterized in that** the extension (11) comprises a hook (33), and the connection part (12) comprises a locking part (34) configured for connecting with the hook (34) to prevent the dispenser casing (7) from detached in a front-back direction from the door panel (5).
 14. The refrigeration appliance (1) of any one of preceding claims, **characterized in that** the door panel (5) forms the front surface of the door (3).
 15. The refrigeration appliance (1) of any one of claim 1 to 13, **characterized in that** the door (3) further comprises a front panel (15), the front panel (15) being closely near the door panel (5) and having a front opening (16) corresponding to the opening (4), and the front panel (15) forming at least a major portion the front surface of the door (3).
 16. The refrigeration appliance (1) of claim 15, **characterized in that** it further comprises a sealing strip (35) provided between the front panel (15) and the door panel (5) along the edge of the opening (4).
 17. The refrigeration appliance (1) of claim 15 or 16, **characterized in that** the front panel (15) is formed of glass.
 18. The refrigeration appliance (1) of any one of preceding claims, **characterized in that** it further comprises a control panel (17), the control panel (17) being at least partly received in the opening (4).
 19. A method for manufacturing a refrigeration appliance (1), the method comprising:
 - providing a refrigerator body (2) which defines at least one storage compartment (26);
 - providing a door (3); and
 - connecting the door (3) to the refrigerator body (2);
 - wherein, the step of providing the door (3) comprises:
 - a) providing a door panel (5), the door panel (3) having an opening (4),
 - b) providing a dispenser casing (7) defining an inner cavity (8) and comprising a cavity rim (9) provided along a front end of the inner cavity (8),
 - c) disposing sealing means (10) between the back surface of the door panel (5) and the cavity rim (9), and
 - d) connecting the cavity rim (9) of the dispenser casing (7) to the door panel (5) along the opening (4) from the back side of the door panel (5), the dispenser casing (7) as a whole being located behind a plane in which the opening (4) lies.

20. The method of claim 19, **characterized in that** in step a) the door panel (5) is formed with an extension (11) which extends backwardly from the edge of the opening (4).
21. The method of claim 20, **characterized in that** the dispenser casing (7) comprises a slot (13) configured for mating with the extension (11), and the extension (11) is inserted into the slot (13) in step c).
22. The method of any one of claims 19 to 21, **characterized in that** the front surface of the cavity rim (9) of the dispenser casing (7) is connected to the back surface of the door panel (5) in step d).

Patentansprüche

1. Kühlgerät (1), das Folgendes umfasst:

eine Tür (3), die eine Türverkleidung (5) mit einer Öffnung (4) umfasst, und
einen in der Tür (3) vorgesehenen Spender (6), der ein Spendergehäuse (7) umfasst, das mit der Türverkleidung (5) verbunden ist und einen Innenhohlraum (8) definiert, der der Öffnung (4) entspricht, und wobei zumindest ein Abschnitt des Innenhohlraums (8) so konfiguriert ist, dass er einen Außenbehälter aufnimmt, und
wobei das Spendergehäuse (7) eine Hohlraum-einfassung (9) umfasst, die an einem vorderen Ende des Innenhohlraums (8) entlang vorgesehen ist, wobei die Hohlraum-einfassung (9) mit der Rückseite der Türverkleidung (5) verbunden ist,
wobei sich das Spendergehäuse (7) insgesamt nicht über die Vorderseite der Türverkleidung (5) hinaus erstreckt,
dadurch gekennzeichnet, dass die Tür (3) ferner ein Dichtungsmittel (10) umfasst, das zwischen der Rückseite der Türverkleidung (5) und der Hohlraum-einfassung (9) angeordnet ist.

2. Kühlgerät (1) nach Anspruch 1, **dadurch gekennzeichnet, dass** das Dichtungsmittel (10) am Rand der Öffnung (4) entlang einen geschlossenen Ring bildet.
3. Kühlgerät (1) nach Anspruch 1 oder 2, **dadurch gekennzeichnet, dass** das Dichtungsmittel (10) ein Klebeband umfasst.
4. Kühlgerät (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Türverkleidung (5) einen Ansatz (11) umfasst, der sich vom Rand der Öffnung (4) aus nach hinten erstreckt.
5. Kühlgerät (1) nach Anspruch 4, **dadurch gekenn-**

zeichnet, dass der Ansatz (11) einen Flansch umfasst, der vom Rand der Öffnung (4) aus nach hinten gebogen ist.

6. Kühlgerät (1) nach Anspruch 4 oder 5, **dadurch gekennzeichnet, dass** der Ansatz (11) entlang des gesamten Rands der Öffnung (4) vorgesehen ist.
7. Kühlgerät (1) nach einem der Ansprüche 4 bis 6, **dadurch gekennzeichnet, dass** der Ansatz (11) zumindest im Wesentlichen senkrecht zu einer Ebene liegt, in der die Öffnung (4) liegt.
8. Kühlgerät (1) nach einem der Ansprüche 4 bis 7, **dadurch gekennzeichnet, dass** der Ansatz (11) außerhalb des Innenhohlraums (8) liegt.
9. Kühlgerät (1) nach einem der Ansprüche 4 bis 8, **dadurch gekennzeichnet, dass** das Spendergehäuse (7) einen Verbindungsteil (12) umfasst, der zum Verbinden mit dem Ansatz (11) konfiguriert ist, wobei der Ansatz (11) und der Verbindungsteil (12) eine Steckverbindung bilden.
10. Kühlgerät (1) nach Anspruch 9, **dadurch gekennzeichnet, dass** der Verbindungsteil (12) einen Schlitz (13) umfasst, der zum Zusammenfügen mit dem Ansatz (11) konfiguriert ist.
11. Kühlgerät (1) nach Anspruch 10, **dadurch gekennzeichnet, dass** das Spendergehäuse (7) eine Hohlraumwand (14) umfasst, die den Innenhohlraum (8) definiert, wobei der Schlitz (13) in der Hohlraumwand (14) gebildet und von dem Innenhohlraum (8) getrennt ist.
12. Kühlgerät (1) nach Anspruch 10 oder 11, **dadurch gekennzeichnet, dass** der Schlitz (13) ein offenes Einführende aufweist, das der Öffnung (4) zugewandt ist.
13. Kühlgerät (1) nach einem der Ansprüche 9 bis 12, **dadurch gekennzeichnet, dass** der Ansatz (11) einen Haken (33) und der Verbindungsteil (12) einen Verriegelungsteil (34) umfasst, der zum Verbinden mit dem Haken (34) konfiguriert ist und so verhindert, dass sich das Spendergehäuse (7) in Vorwärts-Rückwärts-Richtung von der Türverkleidung (5) löst.
14. Kühlgerät (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** die Türverkleidung (5) die Vorderseite der Tür (3) bildet.
15. Kühlgerät (1) nach einem der Ansprüche 1 bis 13, **dadurch gekennzeichnet, dass** die Tür (3) ferner eine Frontverkleidung (15) umfasst, wobei sich die Frontverkleidung (15) sehr nahe an der Türverkleidung (5) befindet und eine vordere Öffnung (16) auf-

weist, welche der Öffnung (4) entspricht, und zumindest einen Hauptabschnitt der Vorderseite der Tür (3) bildet.

16. Kühlgerät (1) nach Anspruch 15, **dadurch gekennzeichnet, dass** es ferner einen Dichtungsstreifen (35) umfasst, der entlang des Rands der Öffnung (4) zwischen der Frontverkleidung (15) und der Türverkleidung (5) vorgesehen ist.

17. Kühlgerät (1) nach Anspruch 15 oder 16, **dadurch gekennzeichnet, dass** die Frontverkleidung (15) aus Glas gebildet ist.

18. Kühlgerät (1) nach einem der vorhergehenden Ansprüche, **dadurch gekennzeichnet, dass** es ferner ein Bedienfeld (17) umfasst, das zumindest teilweise in der Öffnung (4) untergebracht ist.

19. Verfahren zum Herstellen eines Kühlgeräts (1), wobei das Verfahren Folgendes umfasst:

Bereitstellen eines Kühlschranks (2), der mindestens ein Ablagefach (26) definiert, Bereitstellen einer Tür (3) und Verbinden der Tür (3) mit dem Kühlschrankhauptteil (2), wobei das Bereitstellen der Tür (3) Folgendes umfasst:

- Bereitstellen einer Türverkleidung (5), die eine Öffnung (4) aufweist,
- Bereitstellen eines Spendergehäuses (7), das einen Innenhohlraum (8) definiert und eine Hohlraumeinfassung (9) umfasst, die entlang eines vorderen Endes des Innenhohlraums (8) vorgesehen ist,
- Anordnen eines Dichtungsmittels (10) zwischen der Rückseite der Türverkleidung (5) und der Hohlraumeinfassung (9) und
- Verbinden der Hohlraumeinfassung (9) des Spendergehäuses (7) mit der Türverkleidung (5) entlang der Öffnung (4) von der Rückseite der Türverkleidung (5) her, wobei sich das Spendergehäuse (7) insgesamt hinter einer Ebene befindet, in der die Öffnung (4) liegt.

20. Verfahren nach Anspruch 19, **dadurch gekennzeichnet, dass** bei Schritt a) die Türverkleidung (5) mit einem Ansatz (11) ausgebildet wird, der sich vom Rand der Öffnung (4) aus nach hinten erstreckt.

21. Verfahren nach Anspruch 20, **dadurch gekennzeichnet, dass** das Spendergehäuse (7) einen Schlitz (13) umfasst, der zum Zusammenfügen mit dem Ansatz (11) konfiguriert ist, und der Ansatz (11) bei Schritt c) in den Schlitz (13) eingeführt wird.

22. Verfahren nach einem der Ansprüche 19 bis 21, **dadurch gekennzeichnet, dass** die Vorderseite der Hohlraumeinfassung (9) des Spendergehäuses (7) bei Schritt d) mit der Rückseite der Türverkleidung (5) verbunden wird.

Revendications

1. Appareil de réfrigération (1), comprenant :

une porte (3), la porte (3) comprenant un panneau de porte (5) ayant une ouverture (4); et un distributeur (6) prévu dans la porte (3), le distributeur (6) comprenant un boîtier de distributeur (7), le boîtier de distributeur (7) étant relié au panneau de porte (5) et définissant une cavité intérieure (8) qui correspond à l'ouverture (4), et au moins une partie de la cavité intérieure (8) étant configurée pour recevoir un récipient extérieur; et

le boîtier de distributeur (7) comprenant un rebord de cavité (9) prévu le long d'une extrémité avant de la cavité intérieure (8), le rebord de cavité (9) étant relié à la surface arrière du panneau de porte (5) ;

dans lequel le boîtier de distributeur (7) dans son ensemble ne s'étend pas au-delà de la surface avant du panneau de porte (5) ;

caractérisé en ce que la porte (3) comprend en outre un moyen d'étanchéité (10) agencé entre la surface arrière du panneau de porte (5) et le rebord de cavité (9).

2. Appareil de réfrigération (1) selon la revendication 1, **caractérisé en ce que** le moyen d'étanchéité (10) forme une structure en boucle fermée le long du bord de l'ouverture (4).

3. Appareil de réfrigération (1) selon la revendication 1 ou 2, **caractérisé en ce que** le moyen d'étanchéité (10) comprend un ruban adhésif.

4. Appareil de réfrigération (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le panneau de porte (5) comprend une extension (11) s'étendant vers l'arrière à partir du bord de l'ouverture (4).

5. Appareil de réfrigération (1) selon la revendication 4, **caractérisé en ce que** l'extension (11) comprend une bride qui est pliée vers l'arrière à partir du bord de l'ouverture (4).

6. Appareil de réfrigération (1) selon la revendication 4 ou 5, **caractérisé en ce que** l'extension (11) est prévue le long de tout le bord de l'ouverture (4).

7. Appareil de réfrigération (1) selon l'une quelconque des revendications 4 à 6, **caractérisé en ce que** l'extension (11) est au moins sensiblement perpendiculaire à un plan dans lequel se trouve l'ouverture (4). 5
8. Appareil de réfrigération (1) selon l'une quelconque des revendications 4 à 7, **caractérisé en ce que** l'extension (11) se trouve à l'extérieur de la cavité intérieure (8). 10
9. Appareil de réfrigération (1) selon l'une quelconque des revendications 4 à 8, **caractérisé en ce que** le boîtier de distributeur (7) comprend une partie de connexion (12) configurée pour la connexion avec l'extension (11), l'extension (11) et la partie de connexion (12) formant une connexion enfichable. 15
10. Appareil de réfrigération (1) selon la revendication 9, **caractérisé en ce que** la partie de connexion (12) comprend une fente (13) configurée pour s'accoupler avec l'extension (11). 20
11. Appareil de réfrigération (1) selon la revendication 10, **caractérisé en ce que** le boîtier de distributeur (7) comprend une paroi de cavité (14) qui définit la cavité intérieure (8), la fente (13) étant formée dans la paroi de cavité (14) et étant séparée de la cavité intérieure (8). 25
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12. Appareil de réfrigération (1) selon la revendication 10 ou 11, **caractérisé en ce que** la fente (13) a une extrémité d'insertion ouverte faisant face à l'ouverture (4). 35
13. Appareil de réfrigération (1) selon l'une quelconque des revendications 9 à 12, **caractérisé en ce que** l'extension (11) comprend un crochet (33), et la partie de connexion (12) comprend une partie de verrouillage (34) configurée pour la connexion avec le crochet (33) pour empêcher le boîtier de distributeur (7) de se détacher dans une direction avant-arrière par rapport au panneau de porte (5). 40
14. Appareil de réfrigération (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce que** le panneau de porte (5) forme la surface avant de la porte (3). 45
15. Appareil de réfrigération (1) selon l'une quelconque des revendications 1 à 13, **caractérisé en ce que** la porte (3) comprend en outre un panneau avant (15), le panneau avant (15) étant à proximité immédiate du panneau de porte (5) et ayant une ouverture frontale (16) correspondant à l'ouverture (4), et le panneau avant (15) formant au moins une partie majeure de la surface avant de la porte (3). 50
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16. Appareil de réfrigération (1) selon la revendication 15, **caractérisé en ce qu'il** comprend en outre une bande d'étanchéité (35) prévue entre le panneau avant (15) et le panneau de porte (5) le long du bord de l'ouverture (4).
17. Appareil de réfrigération (1) selon la revendication 15 ou 16, **caractérisé en ce que** le panneau avant (15) est formé de verre.
18. Appareil de réfrigération (1) selon l'une quelconque des revendications précédentes, **caractérisé en ce qu'il** comprend en outre un panneau de commande (17), le panneau de commande (17) étant au moins partiellement reçu dans l'ouverture (4).
19. Procédé de fabrication d'un appareil de réfrigération (1), le procédé comprenant :
- fournir un corps de réfrigérateur (2) qui définit au moins un compartiment de stockage (26) ;
fournir une porte (3) ; et
connecter la porte (3) au corps de réfrigérateur (2) ;
dans lequel, l'étape de fourniture de la porte (3) comprend :
- a) fournir un panneau de porte (5), le panneau de porte (3) comportant une ouverture (4),
b) fournir un boîtier de distributeur (7) définissant une cavité intérieure (8) et comprenant un rebord de cavité (9) prévu le long d'une extrémité avant de la cavité intérieure (8),
c) disposer un moyen d'étanchéité (10) entre la surface arrière du panneau de porte (5) et le rebord de cavité (9), et
d) connecter le rebord de cavité (9) du boîtier de distributeur (7) au panneau de porte (5) le long de l'ouverture (4) à partir du côté arrière du panneau de porte (5), le boîtier de distributeur (7) dans son ensemble étant situé derrière un plan dans lequel se trouve l'ouverture (4).
20. Procédé selon la revendication 19, **caractérisé en ce qu'à** l'étape a) le panneau de porte (5) est formé avec une extension (11) qui s'étend vers l'arrière à partir du bord de l'ouverture (4).
21. Procédé selon la revendication 20, **caractérisé en ce que** le boîtier de distributeur (7) comprend une fente (13) configurée pour s'accoupler avec l'extension (11) et l'extension (11) est insérée dans la fente (13) à l'étape c).
22. Procédé selon l'une quelconque des revendications

19 à 21, **caractérisé en ce que** la surface avant du rebord de cavité (9) du boîtier de distributeur (7) est reliée à la surface arrière du panneau de porte (5) à l'étape d).

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Fig.1

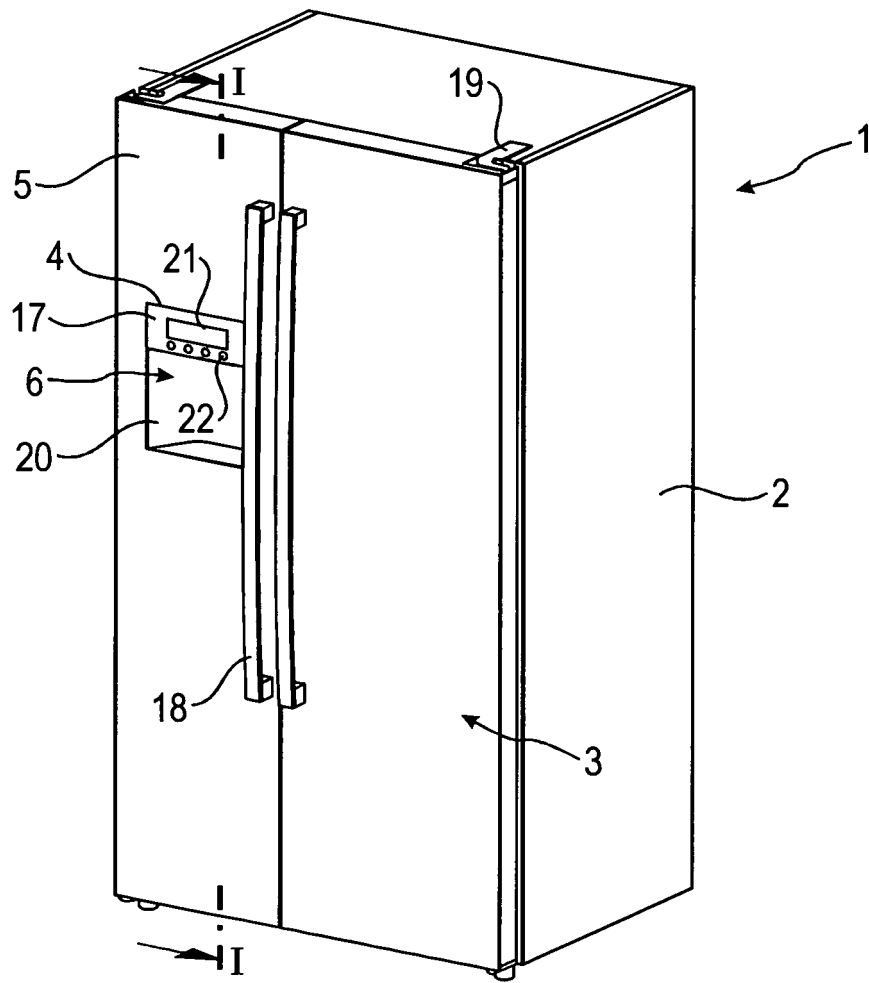


Fig.2

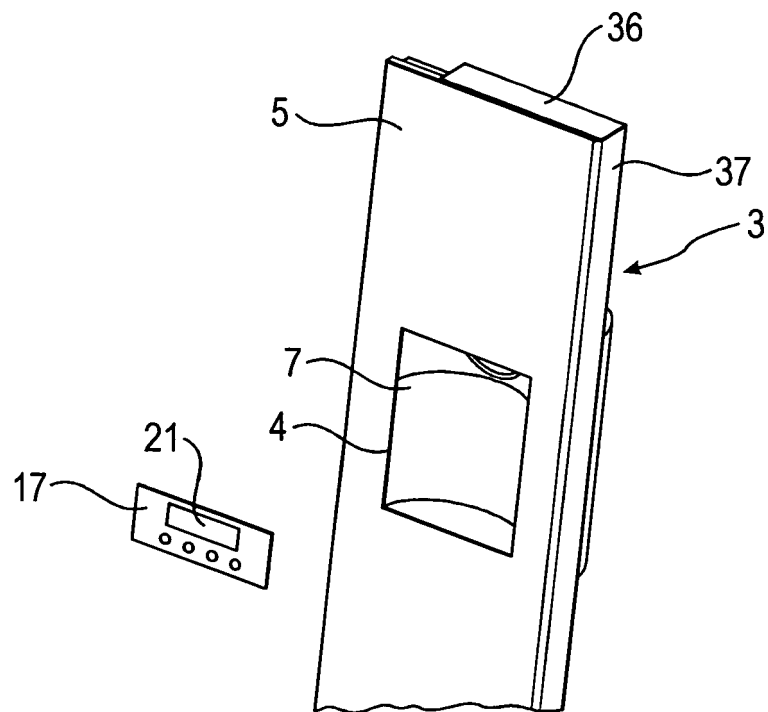


Fig.3

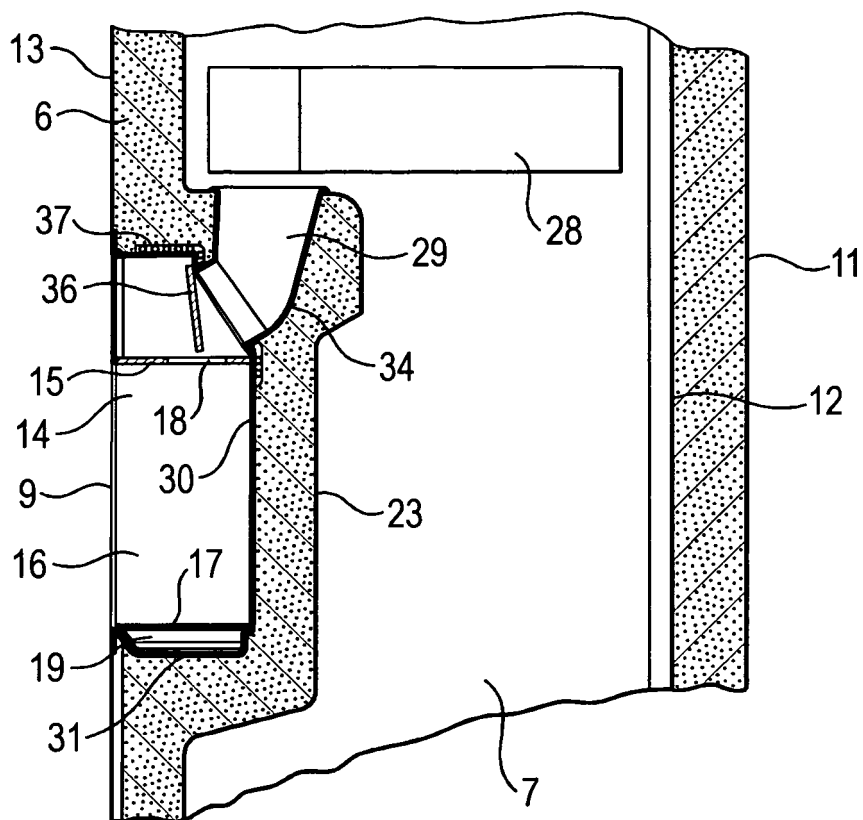


Fig.4

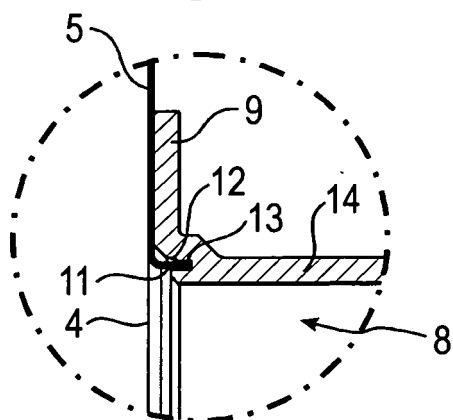


Fig.5

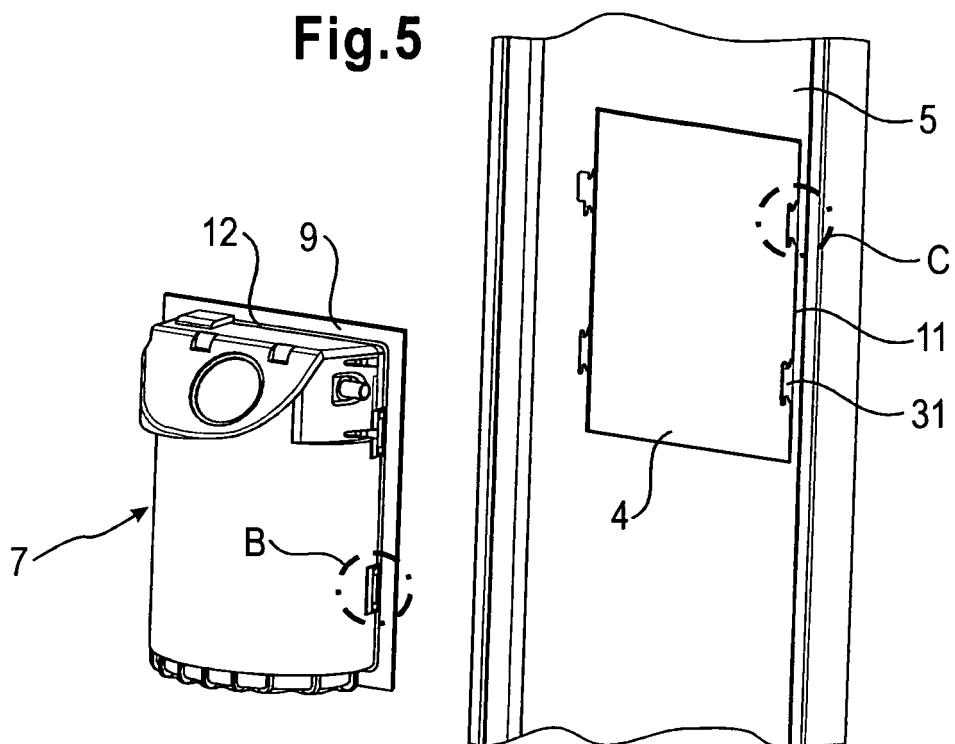


Fig.6

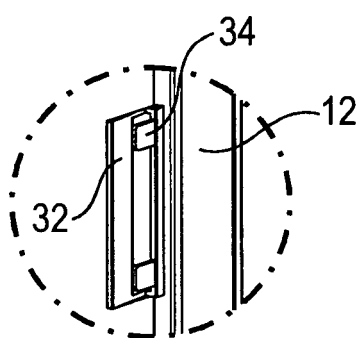


Fig.7

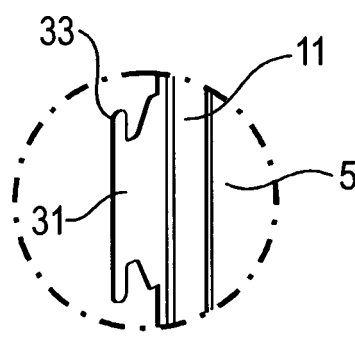


Fig.8

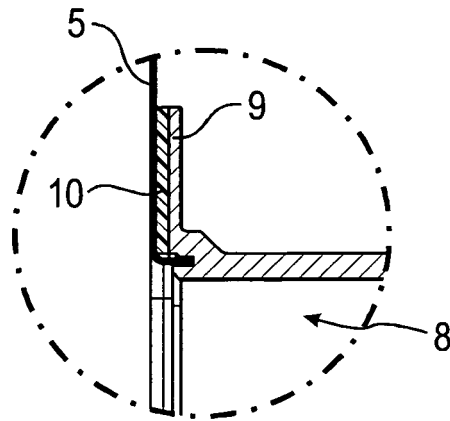
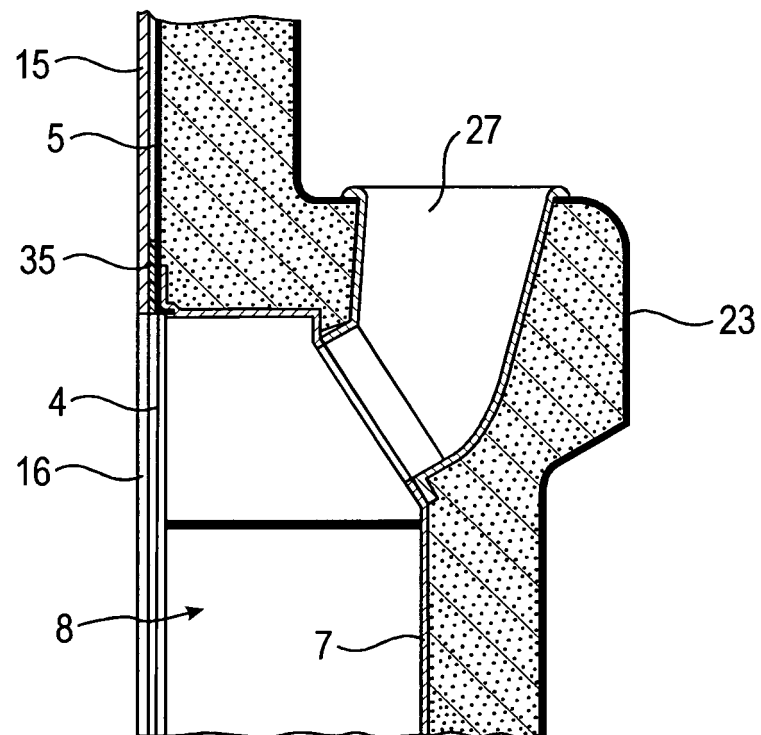


Fig.9



REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- CN 101071026 [0002]
- KR 2006006246 [0003]
- DE 102006018204 A1 [0004] [0005]
- DE 102005057161 A1 [0005]
- DE 102006040358 A1 [0006]