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- (54) **Title:** HOUSEHOLD APPLIANCE

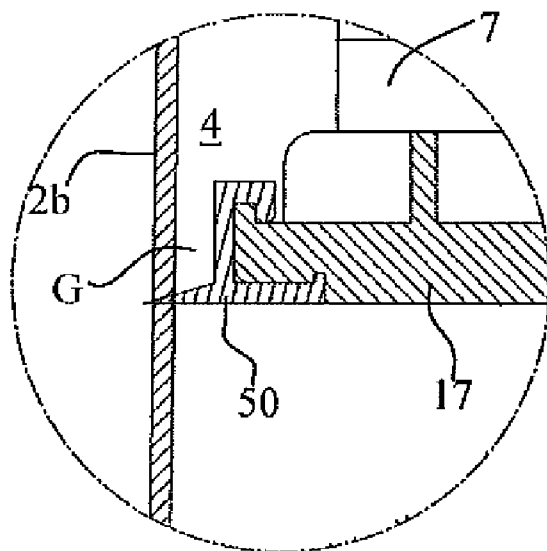


Figure 7

- (57) **Abstract:** The present invention relates to a household appliance, in particular a refrigeration appliance. The household appliance comprises: a cabinet (2) defining a compartment (4), wherein the compartment (4) has a front opening (4a); and a storage unit (7) which is constructed independently from the cabinet (2) and is received within the compartment (4), wherein a gap (G) is formed between at least one side of the storage unit (7) and a corresponding side wall (2b) of the compartment (4). According to suggestions of the present invention, the household appliance further comprises a gap shielding member (50), which is located adjacent the front opening (4a) to cover at least a part of the gap (G).



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HOUSEHOLD APPLIANCE

FIELD OF THE INVENTION

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The present invention relates to a household appliance, more particularly to a household appliance, such as a refrigeration appliance, having a storage unit.

BACKGROUND

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PCT application WO 2005/114070 discloses a refrigeration appliance, which comprises a low-pressure storage unit, wherein the low-pressure storage unit is constructed independently and then mounted in a cabinet of the refrigeration appliance. The low-pressure storage unit comprises a box-like main unit, which box-like main unit is secured in a storing space defined by the cabinet and is opened at the front end, and a door element which is used to selectively open or close the box-like main unit. When a user opens the storing space of the cabinet, he can have access to items in the storage unit by opening the door element of the storage unit.

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20 The storage unit has to be constructed in a way that it is smaller than the storing space, such that the independently constructed storage unit can be smoothly inserted into the storing space. Therefore, after the storage unit is mounted in the cabinet, a gap will exist between inner surfaces of side walls of the storage unit and of the storing space. If the gap is too large, it will not facilitate the aesthetic of the refrigeration appliance.

25 However, if the gap is too small, the storage unit is possibly hindered when it is mounted into the cabinet or it is hardly assembled, because some factors, such as the foaming deformation and the assembling error of the body, exist.

SUMMARY OF THE INVENTION

It is an objective of the present invention to solve at least one of the above-mentioned problems, such that a household appliance is provided in which an independently constructed storage unit can be smoothly inserted into a cabinet of the appliance and
5 thus provides an attractive appearance.

Therefore, on the one hand, the present invention relates to a household appliance, in particular a refrigeration appliance, comprising: a cabinet defining a compartment, wherein the compartment has a front opening; and a storage unit, which is constructed
10 independently from the cabinet and received within the compartment, wherein a gap is formed between at least one side of the storage unit and a corresponding side wall of the compartment; characterized in that the appliance further comprises a gap shielding member located in the compartment to cover at least a part of the gap.

15 Therefore, even if the gap between the storage unit and the compartment can be completely or partially covered by the gap shielding member and its influence on the appearance of the house appliance can be reduced or even eliminated, it can be completely anticipated that the storage unit can be smoothly inserted into the compartment or removed out of the compartment. Furthermore, by reasonably
20 arranging the gap shielding member, the household appliance can possibly have such a clean and neat appearance that the storage unit looks like an integral part of the cabinet.

Other individual features or features which are combined with other features so as to
25 be considered as belonging to the characteristic of the present invention will be described in the attached claims.

According to a preferred embodiment of the present invention, the gap shielding member is detachably secured at one of the storage unit and the side wall.

According to a preferred embodiment of the present invention, the gap shielding member is at least partially flexible, and is in contact with an inner surface of the side wall and the storage unit respectively.

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According to a preferred embodiment of the present invention, the gap shielding member is secured on the storage unit or the side wall in a form fitted manner.

According to a preferred embodiment of the present invention, the gap shielding member comprises a rigid securing part, which is secured to the storage unit or the side wall, and a covering part, which is at least partially flexible and covers the gap.

According to a preferred embodiment of the present invention, the gap shielding member is secured on the storage unit, the securing part comprises a clipping slot, and the clipping slot is clipped at a corresponding edge of the storage unit.

According to a preferred embodiment of the present invention, the gap shielding member comprises at least one hook which is hooked on the storage unit.

According to a preferred embodiment of the present invention, the covering part has a width, which is larger than that of the gap, such that the covering part is pressed and abutted against the side wall of the compartment.

According to a preferred embodiment of the present invention, the covering part is formed by a limb extending from the securing part.

According to a preferred embodiment of the present invention, the securing part is formed integrally with the covering part.

According to a preferred embodiment of the present invention, the gap shielding member is an elongate and extruded member.

5 According to a preferred embodiment of the present invention, the storage unit has a width, which is slightly smaller than that of the compartment, and at least one gap shielding member is disposed at each of both longitudinal sides of the storage unit.

According to a preferred embodiment of the present invention, the storage unit comprises a main body secured within the cabinet and having a receiving space with
10 an opening at a front end thereof, and a door for selectively closing the receiving space, and the gap shielding member is located between the main body and the side wall.

According to a preferred embodiment of the present invention, the gap shielding member is secured at a front end of the main body.
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According to a preferred embodiment of the present invention, the main body has an abutting surface for abutting with the door, and the gap shielding member has a front surface at least approximately flushing with the abutting surface.

20 According to a preferred embodiment of the present invention, the household appliance comprises an evacuation device, and the storage unit is a low-pressure storage unit connected with the evacuation device and capable of being maintained in a low-pressure storage state.

25 The present invention particularly applies to the refrigeration appliance.

The configuration of the present invention and other objectives and beneficial effects thereof will be well understood by description of preferred embodiment in accompany of the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

As a part of the description and in order to provide further explanation of the present
5 invent, the drawings illustrate preferred embodiments of the present invention, and
together with the description are used to explain the principle of the present invention.
In the drawings:

Figure 1 shows a schematic perspective view of a refrigeration appliance according to
10 a preferred embodiment of the present invention, wherein a door of the refrigeration
appliance is not shown;

Figure 2 shows a schematic assembled perspective view of a low-pressure storage
unit according to a preferred embodiment of the present invention;

15 Figure 3 is a schematic perspective view, showing that the low-pressure storage unit
according to the preferred embodiment of the present invention is opened;

Figure 4 is a schematic exploded view, showing a main body of the low-pressure
20 storage unit according to the preferred embodiment of the present invention;

Figure 5 is a schematic partial cross-sectional view taken in the direction A-A in figure
2;

25 Figure 6 is a schematic perspective view of a gap shielding member according to a
preferred embodiment of the present invention; and

Figure 7 is a schematic partial cross-sectional view, showing that the gap shielding
member according to the preferred embodiment of the present invention is mounted

between an inner shell and the main body.

DETAILED DESCRIPTION OF THE INVENTION

5 As shown in figure 1, a refrigeration appliance 1 comprises a thermally insulated cabinet 2, which cabinet 2 includes an outer shell 2a, an inner shell 2b and a thermal insulation layer (not shown) therebetween. The cabinet 2 defines a plurality of thermally insulated storage compartments 3, 4 and 5 to store items such as foods. In the present embodiment, these storage compartments are an upper refrigeration
10 compartment 3, a lower freezing compartment 5 and a preservation compartment 4 which is located between the upper and lower compartments and is maintained at a temperature of slightly higher than zero Degree Celsius. These storage compartments 3, 4 and 5 have front openings 3a, 4a and 5a respectively, which can be closed by respective doors (not shown).

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It should be understood that the present invention is not limited by the specific arrangement of the storage compartments of the refrigeration appliance. The present invention can be applied for other types of refrigeration appliance, such as a refrigerator having refrigerating and freezing compartments arranged one above the
20 other, a side-by-side combination refrigerator as well as a refrigerator having a drawer-typed door and/or a French door refrigerator or the like.

The refrigeration appliance 1 has a close-looped evaporative refrigeration system. The refrigeration system comprises at least a compressor (not shown), a condenser (not
25 shown), a throttling device (not shown) and an evaporator (not shown). Since this kind of refrigeration system is well-known in the prior art, its detailed explanation is omitted here.

The refrigeration appliance 1 is provided with a low-pressure storage unit 7, having an

evacuatable storing chamber 32, and an evacuation device (not shown) for evacuating gas out of the storing chamber 32. The evacuation device can comprise a vacuum pump and a pipeline (not shown) connecting between the vacuum pump and the low-pressure storage unit 7.

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In the present embodiment, the low-pressure storage unit 7 is provided in the preservation compartment 4. The low-pressure storage unit 7 is located at a bottom of the preservation compartment 4, and is supported on a bottom wall of the preservation compartment 4. In the present embodiment, a preservation container 6 is provided
10 above the low-pressure storage unit 7, which preservation container has a higher humidity and is adapted for storing foods such as vegetables. It should be understood that, in an alternative embodiment, the low-pressure storage unit 7 can be provided in other storage compartments, such as the refrigerating compartment 3 or a variable compartment whose temperature zone can be changed between a refrigerating
15 temperature zone and a freezing temperature zone.

Figurer 2 is a schematic assembly perspective view showing the low-pressure storage unit 7 according to a preferred embodiment of the present invention. Figure 3 is a schematic perspective view showing that the low-pressure storage unit 7 according to
20 the preferred embodiment of the present invention is opened. As shown in figures 2 and 3, in this embodiment, the low-pressure storage unit 7 is generally in the form of a flat rectangular parallelepiped and comprises a main body 8 being opened at one end and a drawer-typed container 9 which is movably received in the main body 8.

25 The main body 8 defines a flat receiving space having a front opening. The drawer-typed container 9, at its front wall, is formed with a door 10 for closing the front opening of the main body 8. A tray-shaped container body 12 is connected at a rear side of the door 10 for storing items. The main body 8 is received and secured in the cabinet 2. It is preferable that the main body 8 is detachably secured in the

preservation compartment 4. A user can draw out the draw-typed container 9 to have access to the items in the low-pressure storage unit 7.

5 The main body 8 and the door 10 have widths which each are slightly less than the width of the preservation compartment 4. Thus it is ensured that the main body 8 and the door 10 can be inserted into the preservation compartment 4 or be pulled out of the preservation compartment 4. Therefore, gaps can be formed between both sides of the low-pressure storage unit 7 and the inner shell 2b of the preservation compartment 4 respectively. In order to shield these gaps, the low-pressure storage unit 7 can
10 comprise a deformable gap shielding member 50 which is provided at the front end of the main body 8. The detailed configuration of the gap shielding member 50 will be explained in the following.

15 The low-pressure storage unit 7 has a housing 40 which is constituted by the main body 8 and the door 10 of the drawer-typed container 9. The housing 40 defines the evacuable storing chamber 32, wherein the tray-shaped container body 12 is located in the storing chamber 32. In the present embodiment, the storing chamber 32 is essentially formed by the receiving space of the main body 8.

20 When the storing chamber 32 is closed by the door 10 and the evacuation device is switched on, gas in the storing chamber 32 is evacuated off and the storing chamber 32 is in a low-pressure state. According to a preferred embodiment of the present invention, after the evacuation procedure is completed, the storing chamber 32 has a pressure therein, which pressure is between one standard atmospheric pressure and
25 the absolute vacuum (for example, the absolute vacuum being less than 690 millibars). Because the gas pressure in the storing chamber 32 is less than one standard atmospheric pressure, this chamber can also be called as "a vacuum chamber" by the skilled in the art. In the present embodiment, the storing chamber 32 has a volume of about 20 L.

A sealing element (not shown) can be provided at the front end of the main body 8 and/or at the door 10, such that there is a gas tightness engagement formed between the main body 8 and the door 10 after the drawer-typed container 9 is completely
5 closed. Therefore, gas is prevented from entering into the storing chamber 32 via the engagement site between the main body 8 and the door 10.

A telescopic guide unit 14 is provided between the drawer-typed container 9 and the main body 8, such that the drawer-typed container 9 can be smoothly pulled out of the
10 main body 8 or pushed into the main body 8.

The door 10 is provide with a gas filling passage (not shown), which gas filling passage fluidly communicates with the interior and exterior of the storing chamber 32, and a gas filling valve (not shown) for opening or closing the gas filling passage. When the gas
15 filling passage is opened by the gas filling valve, gas from the exterior can enter into the storing chamber 32 via the gas filling passage such that the low-pressure state of the storing chamber 32 is released.

The door 10 is provided with a handle 13 at the front end. The user can operate the
20 drawer-typed container 9 by the handler 13. In one preferred embodiment, the gas filling valve is provided in such a way that it is associated with the handle 13. That is, when the handle 13 is operated, the gas filling valve is opened such that the storing chamber 32 fluidly communicates with the exterior. Therefore, gas can enter into the storing chamber 32 such that the low-pressure state of the storing chamber 32 is
25 released. In an alternative embodiment, the gas filling valve can be provided independently from the handle 13. For example, the door 10 is provided with a button thereon. The gas filling valve is opened by pressing the button. Then, the user can operate the handle 13 to open the door 10.

The door 10, constituting the front wall of the storing chamber 32, is made of plastic which is easily molded, because some complex structures such as the gas filling valve and the handler 13 and so on will be formed. In the present embodiment, the door 10 is made of ABS resin (acrylonitrile butadiene styrene).

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The inner surface of the door 10 is exposed to the storing chamber 32, and the outer surface of the door constitutes a part of the external contour of the low-pressure storage unit 7 so as to form a part of the wall of the storing chamber 32. When the storing chamber 32 is in the low-pressure state, the door 10 must endure a pressure difference between the interior and the exterior. However, the tray-shaped container

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body 12 endures no pressure because it is located in the storing chamber 32. Therefore, the door 10 has a thickness which is larger than the tray-shaped container body 12. In the present embodiment, the thickness of the door 10 is 6 millimeters, and the tray-shaped container body 12 can have a thickness of about 1 to 2 millimeters.

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Figure 4 is a schematic exploded perspective view showing the main body 8 according to a preferred embodiment of the present invention. As shown in figures 2 and 3 by combination with figure 4, the main body 8 comprises a box-shaped box body 11 which is opened at front and rear ends, a rear cover 16 which is secured at the rear end of the box body 11 to close a rear opening 26 of the box body 11, and a front jointing unit 17,

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which is secured at an edge of a front opening 25 of the box body 11.

A sealing element 18 is provided between the box body 11 and the rear cover 16 as well as between the box body 11 and the front jointing unit 17 respectively, such that the box body 11 forms a gas tightness engagement with the rear cover 16 and a gas tightness engagement with the front jointing unit 17 respectively.

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In the present embodiment, the box body 11 comprises a top wall 21, a bottom wall 23, left and right side walls 22 which are connected between the top wall 21 and the

bottom wall 32. The top, bottom, left and right side walls are made of metal having a larger material strength. The box body 11 constitutes a main part of the housing 40. In the present embodiment, the top wall 21, the bottom wall 23 and the left and right side walls 22, all of which are made of metal, are exposed at their inner sides to the storing chamber 32 respectively. Outer surfaces of these walls constitute a part of the external contour of the low-pressure storage unit 7, and constitute a majority of the upper wall, the lower wall and two side walls of the storing chamber 32. The front jointing unit 17 is also exposed at its inner side to the storing chamber 32. Therefore, it constitutes a minority of the upper boundary, the lower boundary and the two side boundaries of the storing chamber 32. When the storing chamber 32 is in the low-pressure state, the box body 11, the front jointing unit 17 and the rear cover 16 endure a pressure caused by the pressure in the storing chamber 32 being less than the pressure of the exterior. It should be understood that, in an alternative embodiment, it is also possible that all of the upper, lower and two side walls of the storing chamber 32 are completely formed by the box body 11 made of metal.

The top wall 21, the bottom wall 23 as well as the left and right side walls 22 can be produced by a metal sheet, whose thickness is not more than 4 millimeters. Preferably, the thicknesses of these walls 21 to 23 are 2 millimeters to 2.5 millimeters.

The top wall 21, the bottom wall 23 as well as the left and right side walls 22 of the box body 11 are preferably formed in a one-piece structure, such that any jointing seam between these walls can be reduced or even eliminated. In the present embodiment, the top wall 21, the bottom wall 23 as well as the left and right side walls 22 are formed by a piece of metal sheet (cold rolled plate), which is bent into a rectangular shape and then is welded. As shown in figures 3 and 4, a welding seam 33 is located at the middle site of the right side wall 22. On the one hand, because the side wall 22 endures a less pressure than the top wall 21 and the bottom wall 23, this may facilitate reducing a possibility that air leakage occurs at the welding seam 33 under pressure. On the other

hand, this may also facilitate arranging a clamp during the welding procedure. Furthermore, because the welding seam is located at a side wall which cannot be readily noticed by the user, this may facilitate achieving a better aesthetic of the refrigeration appliance 1.

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It should be understood that, in an alternative embodiment, it is also possible that the top wall 21, the bottom wall 23 as well as the left and right side walls 22 of the box body 11 are formed by a plurality of metal sheets, which are jointed (such as welded) together.

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Furthermore, the box body 11 can also be made of other metal such as aluminum. On the case that the box body is made of aluminum, the box body is preferably achieved by an integrally extruding procedure. Because the modulus of elasticity of aluminum is less than that of steel, it is preferable that the box body made of aluminum has a thickness of larger than 2 millimeters, for example being 4 millimeters.

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In the present embodiment, the top wall 21 is symmetrical to the bottom wall 23. The two walls constitute a majority of the total wall area of the box body 11. When the low-pressure storage unit 7 is in a low-pressure state, the top wall 21 and the bottom wall 23 endure more pressure than the other walls of the low-pressure storage unit 7. In order to increase moments of inertia of the top wall 21 and the bottom wall 23, the top wall 21 and the bottom wall 23 each are stamped with a plurality of protruding zones 34 which protrude outwards.

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According to a preferred embodiment of the present invention, as shown in figures 3, 4 and 5, mounting plates 27 are provided at the front and rear ends of the box body 11 and at outer sides of the top wall 21, the bottom wall 23 as well as the left and right side walls 22, such that no through hole needs be provided on the top wall 21, the bottom wall 23 as well as the left and right side walls 22 to secure the front jointing unit 17 and

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the rear cover 6 to the box body 11. The mounting plates 27 can be made of metal, for example made by steel sheets.

Each mounting plate 27 comprises a jointing foot 27a, which is horizontally secured on
5 a corresponding one of the walls 21 to 23. In the present embodiment, the mounting plate 27 is secured on the box body 11 by welding the jointing foot 27a to the corresponding one of the walls 21 to 23. In an alternative embodiment, the mounting plate 27 can be secured on the box body 11 in other ways, for example is adhered on the box body 11.

10 The mounting plate 27 comprises an extension 27b, which folds from the jointing foot 27a and then extends outwards. In the present embodiment, the extension 27b is substantially perpendicular to the corresponding one of the walls 21 to 23. The extension 27b has a plate shape. It has planar front and rear surfaces. The extensions
15 27b at the front and rear ends of the box body 11 each are at a distance from the front and rear end faces of the box body 11.

In the present embodiment, the mounting plate 27 has an L-shape in its cross-section, which is formed by the extension 27b and the jointing foot 27a. However, in an
20 alternative embodiment, the extension 27b can be formed integrally on the corresponding one of the walls 21 to 23 such that the extension extends outwards directly from the corresponding one of the walls 21 to 23 of the box body 11.

Each extension 27b is provided with a plurality of first holes 31a which extend all the
25 way through the front and rear surfaces of the extension. Preferably, the first holes 31a of each extension 27b are arranged at a predetermined interval with each other, and they are arrayed in a row. The first holes 31a located at the front and rear ends of the box body 11 each form a rectangular frame, whose size is larger than the front/rear opening 25, 26. The corresponding rectangular frame encloses the box body 11 therein.

The first holes 31a at the rear end of the box body 11 are threaded. However, the first holes 31a at the front end of the box body 11 are not threaded.

5 The rear cover 16 and the front jointing unit 17 according to a preferred embodiment of the present invention are particularly explained in their structures in detail below.

The rear cover 16 is connected to the rear opening 26 of the box body 11, constitutes the rear wall of the housing 40 and delimits the rear boundary of the storing chamber 32. The rear cover 16 is in the form of a square plate, which corresponds to the rear
10 opening 26. The rear cover 16 has a size which is larger than that of the rear opening 26. The rear cover 16 extends beyond the rear opening 26.

The rear cover 16 is provided with an evacuation passage (not shown) extending through the rear cover 16 and an evacuation valve unit 36 for selectively closing or
15 opening the evacuation passage. In the present embodiment, the evacuation valve unit 36 extends above the top wall 21, and has a jointing opening 39 above the top wall 21. The low-pressure storage unit 7 connects with a pipeline secured on the cabinet 2 via the jointing opening 39, such that the low-pressure storage unit 7 can fluidly
communicate with the evacuation device.

20

The rear cover 16 comprises a main wall portion 20 constituting the most part of the rear cover and a rear jointing portion 19, which is provided around the main wall portion 20 and connects the rear cover 16 to the edge of the rear opening 26. The rear jointing portion 19 connects with the entire edge of the rear opening 26.

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In the present embodiment, the rear jointing portion 19 and the main wall portion 20 are produced by integral injection molding of plastic, whose modulus of elasticity is less than metal. Preferably, the rear cover 16 is made of material having a larger material strength, such as polycarbonate (PC). The main wall portion 20 made of PC has a

thickness of about 6 millimeters. In order to enhance the strength of the main wall portion 20, the main wall portion 20 is provided with a plurality of reinforcing ribs 35 on its rear surface.

5 It should be understood that, in an alternative embodiment, the rear jointing portion 19 and the main wall portion 20 can be provided independently with each other, and then they are airtightly secured to form the rear cover 16. This will be particularly beneficial in the case that the rear jointing portion 19 and the main wall portion 20 are made of different materials.

10

The front jointing unit 17 connects at the entire edge of the front opening 25, and has a square framed structure forming a close-loop. The front jointing unit 17 has an abutting face 37 for abutting with the door 10. In the present embodiment, the abutting face 37 is planar, and is in the same longitudinal plane. When the door 10 is closed, the sealing
15 element on the door 10 is pressed between the abutting face 37 and the door 10 to make a sealing effect.

15

In order that the front jointing unit 17 and the rear cover 16 are airtightly connected on the box body 11 respectively, the front jointing unit 17 and the rear cover 16 each are
20 provided with a ring-shaped groove 30 at a side facing the box body 11, which groove is used to receive a ring-shaped sealing element 18. The front and rear ends of the top wall 21, the side walls 22 and the bottom wall 23 of the box body 11 each are inserted into the corresponding groove 30. The sealing element 18 is located between the groove 30 and the box body 11.

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Outside of the groove 30, the front jointing unit 17 and the rear cover 16 each are provided with a plurality of second holes 31b. These second holes 31b are provided on the outer surface portions of the front jointing unit 17 and the rear jointing unit 19 beyond the top wall 21, the side walls 22 and the bottom wall 23, and are located

outside of the storing chamber 32. The second holes 31b on the front jointing portion 17 and the rear cover 16 form rectangular frames respectively, each of which rectangular frames has a size which is larger than the front/rear opening 25, 26.

- 5 In the present embodiment, the second holes 31b on the front jointing unit 17 extend forwards from the rear side of the front jointing unit 17, do not extend through the front jointing unit 17 and thus blind holes, which are threaded therein for attaching screws 29. The second holes 31b on the rear cover 16 extend forwards from the rear side of the rear jointing portion 19 through the rear jointing portion 19 and form through holes to be
10 inserted by corresponding screws 29.

- The front jointing unit 17 is formed by integral injection molding of plastic. In the present embodiment, because the front jointing unit 17 is provided with the threaded holes for attaching the screws 29, the front jointing unit 17 is formed from a mixture of
15 PC resin having a larger strength and ABS resin having a better toughness by injection molding, such that the strength and the toughness of the unit is balanced.

- The securing manner between the front jointing unit 17, the rear cover 16 and the box body 11 will be particularly explained below.
20

The front jointing unit 17 and the rear cover 16 are secured on the front and rear ends of the box body 11 by a plurality of securing units respectively.

- In the present embodiment, each securing unit comprises the screw 29, the first hole
25 31a provided on the mounting plate 27 of the box body 11 and the second hole 31b provided on the front jointing unit 17/the rear cover 16. By inserting the screw 29 into the first hole 31a and the second hole 31b and then screwing the screw 29 with the threaded first hole 31a or the threaded second hole 31b, the front jointing unit 17/the rear cover 16 each can be reliably secured on the box body 11. By use of the screw 29,

the securing unit provides a pretension force between the front jointing unit 17 and the box body 11 as well as between the rear cover 16 and the box body 11, such that the sealing elements 18 located between the front jointing unit 17/the rear cover 16 and the box body 11 can be pressed and thus the sealing effect between the front jointing unit
5 17/the rear cover 16 and the box body 11 can be enhanced.

In an alternative embodiment, the securing unit can adopt another securing piece which can provide the pretension force. For example, the screw can be replaced by a rod-shaped piece which is integrally injection molded on the front jointing unit 17 and
10 the rear cover 16. In this case, the second holes 31b on the jointing frame 17 and the rear cover 16 can be omitted.

In the present embodiment, because all of the first holes 31a and the second holes 31b are located outside of the storing chamber 32, the interior of the storing chamber 32
15 cannot fluidly communicate with the exterior due to the arrangement of the first holes 31a and the second holes 31b. Furthermore, because the first holes 31a and the second holes 31b are located outside of the ring-shaped sealing element 18, the first holes 31a and the second holes 31b is in fact separated from the storing chamber 32 and does not communicate with it. In this way, a possibility that gas from the exterior
20 enters into the storing chamber 32 via the first holes 31a and the second holes 31b is eliminated. That is, these first and second holes 31a, 31b cannot have a negative effect on the air tightness of the storing chamber 32, such that the air tightness of the low-pressure storage unit 7 is improved.

25 In the embodiment of the present invention, the housing 40 of the low-pressure storage unit 7 comprises a first member (such as the box body 11), which is made of metal having a larger material strength, and a plurality of second members (such as the front jointing unit 17, the rear cover 16 and the door 10), which are made of plastic, which has a relatively smaller material strength and is easily molded. Therefore, on the one

hand, the first member can obtain a larger strength by a smaller thickness to endure the exterior pressure, such that any deformation of the storing chamber 32 in the low-pressure state can be reduced so as to improve the air tightness of the storing chamber 32. This advantage is particularly prominent in the case that the walls (such as the top wall 21 and the bottom wall 23) of the storing chamber 32 occupying the largest area are mainly or completely made of metal. Especially, when the housing 40 is mainly made of metal, this advantage is particularly prominent. On the other hand, because the housing comprises the second members (such as the front jointing unit 17, the rear cover 16 and the door 10), which are made of plastic and endure the pressure when the storing chamber 32 is in the low-pressure state, structures which are relatively complex and require high accuracy and high degree of air tightness requiring (such as a gas filling valve, an evacuation valve unit and the like requiring high degree of air tightness) can be provided on these second members so as to improve the air tightness of the low-pressure storage unit. Further, because the first member made of metal can have a smaller thickness and a good thermal conductivity, heat can be well conducted between the exterior and the interior of the storing chamber even if the second member has a larger thickness. Furthermore, when the second members constitute only a small portion of the housing and especially they are not provided in a box-shaped structure, the molding process of them is relatively easy. Meanwhile, because they are only the small portion of the low-pressure storage unit 7, they do not have a significant effect on the heat conducting between the exterior and the interior of the low-pressure storage unit 7.

The gap shielding member 50 will be explained in detail with respect to figures 2, 3, 6 and 7.

A gap G exists between the front jointing frame 17 and the inner shell 2b of the cabinet 2. Some structures (such as a mounting structure for securing the main body 8 on the inner shell 2b) between the inner shell 2b and the main body 8 can be noticed by the

user. This influences the impression of the user to the refrigeration appliance 1, and the gap G itself does not facilitate the aesthetic. Therefore, according to a preferred embodiment of the present invention, the refrigeration appliance 1 comprises the gap shielding member 50, which is located between the front part of the low-pressure storage unit 7 and the inner shell 2b to shield the gap G frontally.

The gap shielding member 50 is provided adjacent the front opening 4a. In the present embodiment, the gap shielding member 50 is located between the front jointing frame 17 and the inner shell 2b. The gap shielding member 50 is in the form of an elongated strip and mounted on a corresponding side of the front jointing frame 17.

In the present embodiment, one gap shielding member 50 is provided on each of both longitudinal sides of the front jointing frame 17. In an alternative embodiment, the gap shielding member 50 is only provided on one side of the front jointing frame 17, or it is also possible that each of four sides of the front jointing frame 17 is provided with the gap shielding member 50.

The gap shielding member 50 comprises a rigid securing part 51, which is used to secure the gap shielding member 50 on the front jointing frame 17, and a flexible covering part 52, which extends from the securing part 51 to cover the gap G. In the present embodiment, the gap shielding member 50 is an extruded member, wherein the securing part 51 and the covering part 52 are integrally extrusion molded.

The securing part 51 has a first clipping wall 53 and a second clipping wall 54, which are provided opposed to each other, and a connecting wall 55, which connects between the first clipping wall 53 and the second clipping wall 54. The first clipping wall 53, the second clipping wall 54 and the connecting wall 55 together define a clipping slot 56, which opens at one side. In the present embodiment, the first clipping wall 53 has a lateral width, which is larger than that of the second clipping wall 54. Preferably,

the securing part 51 extends over the length of the gap shielding member 50. The securing part 51 also comprises a hook 57 on each of the first and second clipping walls, wherein the hook 57 folds from an end of a corresponding one of the first and second clipping walls 53 and 54 towards the other of the first and second clipping walls 53 and 54.

The covering part 52 connects with the first clipping wall 53 at one end and extends in a direction far away from the clipping slot 56. The front surfaces of the covering part 52 and of the first clipping wall 53 are in the same plane. The covering part 52 extends over the length of the gap shielding member 50.

The covering part 52 is provided on the gap shielding member 50 as a limb. Along a direction from the end of the covering part that connects with the first clipping wall 53 to a free end of the covering part, the covering part 52 has a gradually decreasing thickness and thus is elastically deformable.

After the piece is mounted on the front jointing frame 17, the side end of the front jointing piece 17 is clipped in the clipping slot 56, wherein the first clipping wall 53 is abutted immediately against the front face of the front jointing frame 17, and the second clipping wall 54 is abutted immediately against the rear face of the front jointing frame 17. In order to flush the front surface of the first clipping wall 53 with the abutting face 37 of the front jointing frame 17, a depression zone is formed on each of two side ends of the front surface of the front jointing frame 17 respectively, the depth of which depression zone corresponds substantially to the thickness of the first clipping wall 53.

Furthermore, a step is formed on the front and rear surfaces of the front jointing frame 17 respectively, which step corresponds to the hook 57. The hook 57 is hooked on the step such that the gap shielding member 50 is prevented from falling off from the front jointing frame 50.

Before being inserted into the preservation compartment 4, the main body 8 provided with the gap shielding member 50, at the plane where the front surface of the covering part 52 locates, has a lateral width, which is larger than that of the preservation
5 compartment 4. After the main body 8 is completely inserted into the preservation compartment 4, the covering part 52 is pressed by the inner shell 2b, thus is deformed and is abutted against the inner shell 2b. In this way, the gap G and some structures behind the front jointing frame 17 can be shielded by the covering part 52. Therefore, when the door 10 is opened, the user can notice a more clean and neat appearance.

10 In the above embodiments, the gap shielding member 50 is secured on the low-pressure storage unit 7. In an alternative embodiment, the gap shielding member can also be secured on the inner shell 2b.

15 Furthermore, in the above embodiments, the gap shielding member 50 is provided between the low-pressure storage unit 7 and the inner shell 2b. However, the present invention is not limited by this. In an alternative embodiment, if desired, the gap shielding member can be provided between any storage unit, which is provided independently from the cabinet and is received in the cabinet, and the inner shell to
20 shield a gap between the storage unit and the inner shell. Of course, the present invention can apply to other kind of house appliance if desired.

CLAIMS

1. A household appliance, in particular a refrigeration appliance (1), comprising:

5 a cabinet (2) defining a compartment (4), wherein the compartment (4) has a front opening (4a); and

a storage unit (7) which is constructed independently from the cabinet (2) and is received within the compartment (4), wherein a gap (G) is formed between at least one side of the storage unit (7) and a corresponding side wall (2b) of the compartment (4);

10 characterized in that the appliance further comprises a gap shielding member (50) which is located adjacent the front opening (4a) to cover at least a part of the gap (G).

2. The household appliance according to claim 1, characterized in that the gap shielding member (50) is detachably secured to one of the storage unit (7) and the side wall (2b).

3. The household appliance according to claim 1 or 2, characterized in that the gap shielding member (50) is at least partially flexible, and is in contact with an inner surface of the side wall (2b) and the storage unit (7) respectively.

4. The household appliance according to claim 1, 2 or 3, characterized in that the gap shielding member (50) is secured on the storage unit (7) or the side wall (2b) in a form fitted manner.

25 5. The household appliance according to any one of the preceding claims, characterized in that the gap shielding member (50) comprises a rigid securing part (51) which is secured at the storage unit (7) or the side wall (2b), and a flexible covering part (52) which is at least partially flexible and covers the gap (G).

6. The household appliance according to claim 5, characterized in that the gap shielding member (50) is secured on the storage unit (7), the securing part (51) comprises a clipping slot (56), and the clipping slot (56) is clipped at a corresponding edge of the storage unit (7).

5

7. The household appliance according to claim 5 or 6, characterized in that the gap shielding member (50) comprises at least one hook (57) which is hooked on the storage unit (7).

10 8. The household appliance according to claim 5, 6 or 7, characterized in that the covering part (50) has a width which is larger than that of the gap (G), such that the covering part (50) is pressed and abutted against the side wall (2b) of the compartment (4).

15 9. The household appliance according to any one of claims 5 to 8, characterized in that the covering part (52) is formed by a limb extending from the securing part (51).

10. The household appliance according to any one of claims 5 to 9, characterized in that the securing part (51) is formed integrally with the covering part (52).

20

11. The household appliance according to any one of the preceding claims, characterized in that the gap shielding member (50) is an elongate extruded member.

12. The household appliance according to any one of the preceding claims,
25 characterized in that the storage unit (7) has a width which is slightly smaller than that of the compartment (4), and at least one gap shielding member (50) is disposed at each of both longitudinal sides of the storage unit (7).

13. The household appliance according to any one of the preceding claims,

characterized in that the storage unit (7) comprises a main body (8) secured within the cabinet (2) and having a receiving space (32) with an opening at a front end thereof, and a door (10) for selectively closing the receiving space (32), and the gap shielding member (50) is located between the main body (8) and the side wall (2b).

5

14. The household appliance according to claim 13, characterized in that the gap shielding member (50) is secured at a front end of the main body (8).

15. The household appliance according to claim 13 or 14, characterized in that the
10 main body (8) has an abutting surface (37) for abutting with the door (10), and the gap shielding member (50) has a front surface at least approximately flushing with the abutting surface (37).

16. The household appliance according to any one of the preceding claims,
15 characterized in that the household appliance comprises an evacuation device, and the storage unit (7) is a low-pressure storage unit which is connected with the evacuation device and can be maintained in a low-pressure storage state.

17. The household appliance according to any one of the preceding claims,
20 characterized in that the household appliance is a refrigeration appliance.

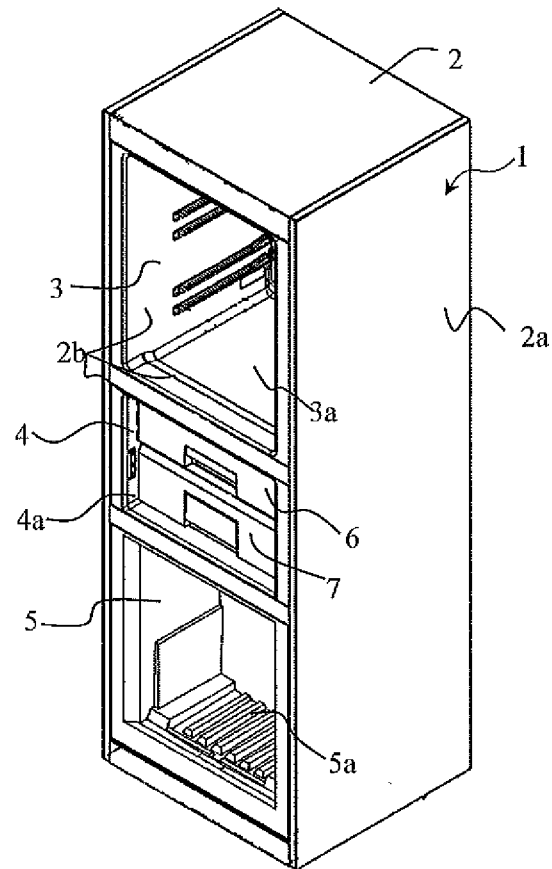


Figure 1

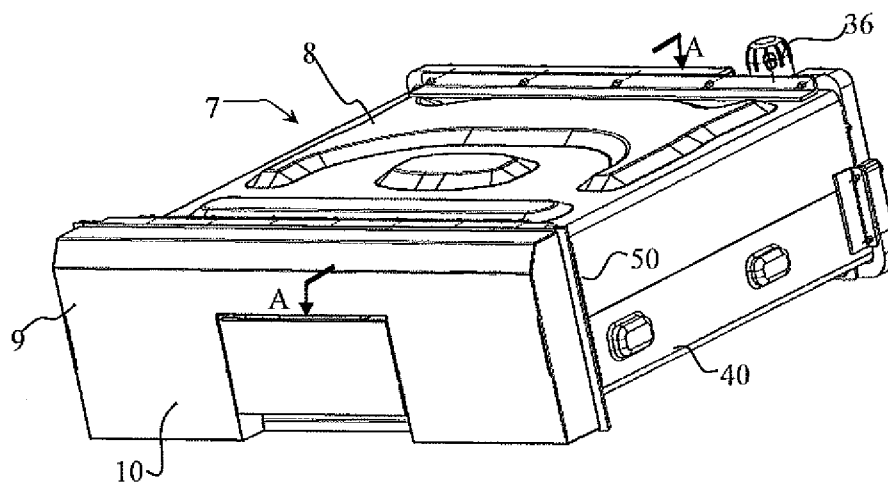


Figure 2

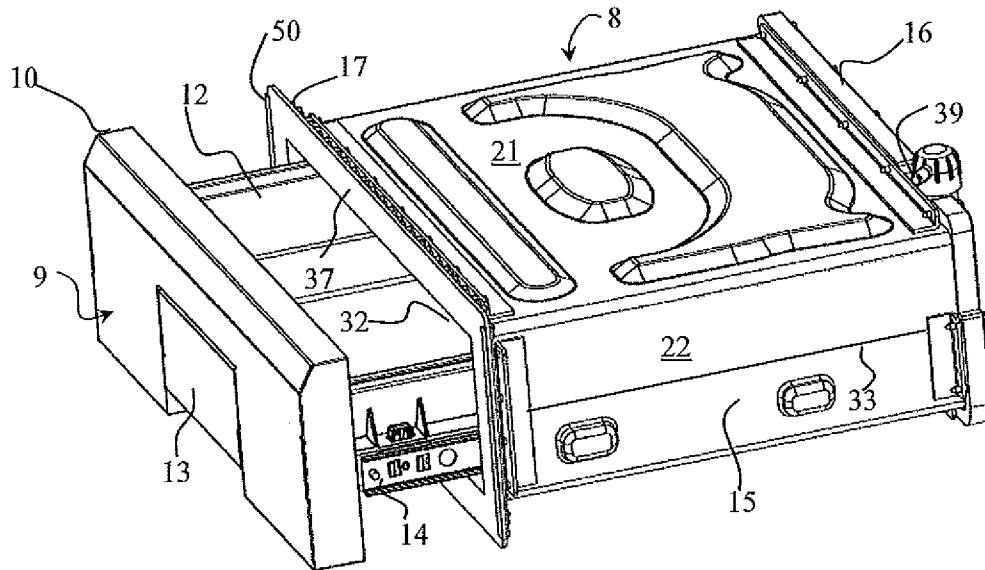


Figure 3

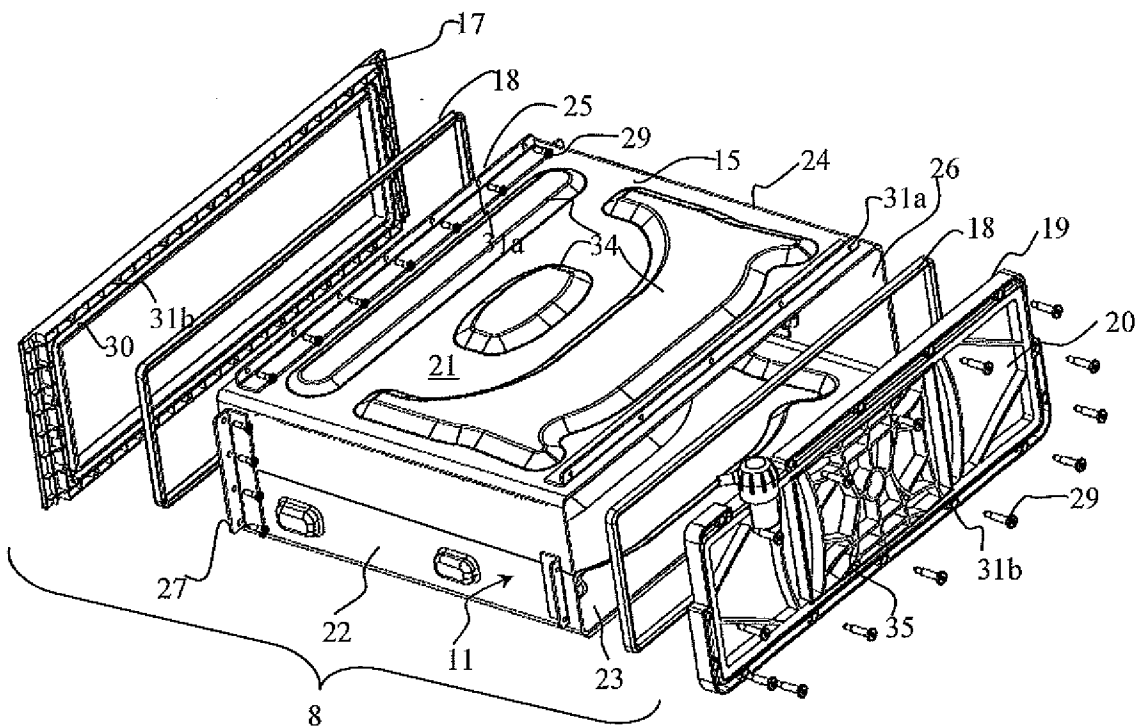


Figure 4

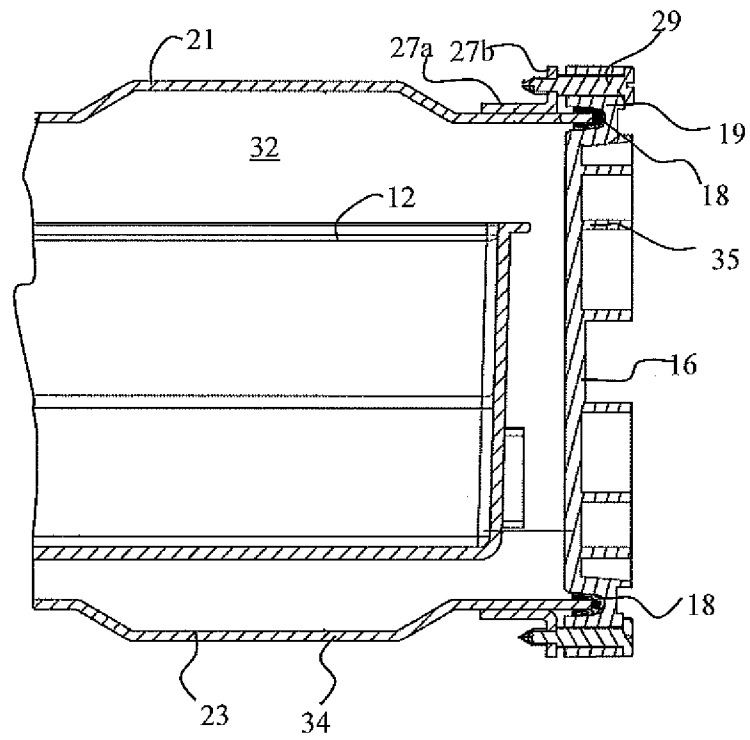


Figure 5

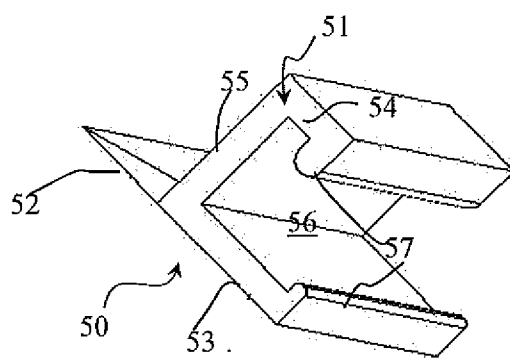


Figure 6

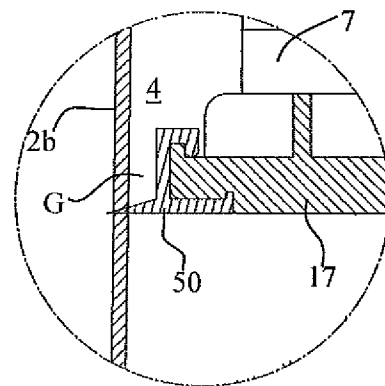


Figure 7