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(54) **OUTDOOR UNIT**

AUSSENEINHEIT

UNITÉ EXTÉRIEURE

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- **YANASE, Tomoya**  
Tokyo 102-0073 (JP)
- **IWAZAKI, Hiroshi**  
Tokyo 102-0073 (JP)

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(74) Representative: **Pfenning, Meinig & Partner mbB**  
**Patent- und Rechtsanwälte**  
**Theresienhöhe 11a**  
**80339 München (DE)**

(73) Proprietor: **Mitsubishi Electric Corporation**  
**Chiyoda-ku**  
**Tokyo 100-8310 (JP)**

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(72) Inventors:  
• **JINNAI, Hiroyuki**  
Tokyo 102-0073 (JP)  
• **KUBONO, Toshiyuki**  
Tokyo 102-0073 (JP)

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## Description

### Technical Field

**[0001]** The present invention relates to an outdoor unit for an air-conditioning apparatus.

### Background Art

**[0002]** In a related-art outdoor unit of an air-conditioning apparatus, a compressor, a heat exchanger, a fan, and other components are accommodated in a housing. The fan is driven to supply outside air to the heat exchanger, and the compressor is operated to circulate refrigerant of a refrigeration cycle. Electric power for operating the compressor, the fan, and other components is supplied to a terminal block of the outdoor unit via a power supply wire. The power supply wire is fixed to a side panel by a fixing member at an end side to be connected to the terminal block. Further, the terminal block is exposed through an opening portion of the side panel of the housing, and the opening portion and the fixing member for the power supply wire are covered with a terminal block cover that is formed separately from the side panel (see, for example, Patent Literature 1). Furthermore, a heat pump water heater is known which is improved in workability in connecting, mounting and demounting piping or the like (see, for example, Patent Literature 2). Moreover, a heat source unit of a heat pump system is known which prevents damage to the power supply cover caused by ignition of the electric wires (see, for example, Patent Literature 3). Additionally, an outdoor unit is known which can prevent an electric cable from coming off by mounting an electric equipment cover without using a cable clamp (see, for example, Patent Literature 4, which describes an outdoor unit comprising the features of the preamble of claim 1).

### Citation List

#### Patent Literature

#### **[0003]**

Patent Literature 1: Japanese Unexamined Patent Application Publication No. 2010-144944  
 Patent Literature 2: JP 2011 158122 A  
 Patent Literature 3: JP 4 941372 B2  
 Patent Literature 4: JP H10 9617 A

### Summary of Invention

#### Technical Problem

**[0004]** In the above-mentioned patent literature 1-3, the fixing member configured to fix the power supply wire to the side panel protrudes outward from the side panel, and the terminal block cover configured to cover the fixing

member also significantly protrudes outward from the side panel.

**[0005]** The above-mentioned outdoor unit including the terminal block cover significantly protruding from the side panel is upsized in outer-shape dimension. Thus, transport efficiency decreases and installation space increases. Further, a side surface of the housing protrudes by the terminal block cover. Thus, design is degraded and the terminal block cover is damaged due to collision of the terminal block cover to an object.

**[0006]** Further, when the housing width is reduced, the width dimension of the heat exchanger is reduced, leading to a reduced heat transfer area and thus decrease in heat exchange efficiency.

**[0007]** The present invention has been made in view of the problems described above, and has an object to provide an outdoor unit of an air-conditioning apparatus in which outward protruding dimension of a terminal block cover from a side panel is decreased to be small, and thus a housing is downsized.

#### Solution to Problem

**[0008]** An outdoor unit according to the present invention is defined in claim 1 and includes a housing including a side panel, a terminal block accommodated in the housing, and a power supply wire connected to the terminal block. The side panel includes an outer shell surface forming a part of an outer surface of the housing, a first recessed surface recessed from the outer shell surface in an inward direction of the housing, and a second recessed surface formed in the first recessed surface and recessed from the first recessed surface in the inward direction of the housing. The power supply wire is arranged on the second recessed surface.

**[0009]** Preferred embodiments of the invention are defined in the dependent claims 2-8.

#### Advantageous Effects of Invention

**[0010]** In the outdoor unit according to the one embodiment of the present invention, the outward protruding dimension of the terminal block cover from the side panel of the housing can be decreased to be small, and thus the housing can be downsized.

**[0011]** The outdoor units described in embodiments 1 and 2 are not according to the invention but helpful for understanding some of its features. Embodiment 3 describes an outdoor unit according to the invention.

#### Brief Description of Drawings

#### **[0012]**

[Fig. 1] Fig. 1 is a perspective view of an outdoor unit according to Embodiment 1.

[Fig. 2] Fig. 2 is an exploded perspective view of the outdoor unit according to Embodiment 1.

[Fig. 3] Fig. 3 is a front view of the outdoor unit according to Embodiment 1.

[Fig. 4] Fig. 4 is a top view of the outdoor unit according to Embodiment 1.

[Fig. 5] Fig. 5 is a side view of the outdoor unit according to Embodiment 1.

[Fig. 6] Fig. 6 is a side view of a state in which a terminal block cover of the outdoor unit according to Embodiment 1 is removed.

[Fig. 7] Fig. 7 is a side view of a state in which the terminal block cover of the outdoor unit according to Embodiment 1 is mounted.

[Fig. 8] Fig. 8 is a sectional view of a side panel of the outdoor unit according to Embodiment 1 taken along the line Z-Z of Fig. 6 and Fig. 7.

[Fig. 9] Fig. 9 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 1 of Embodiment 1 is removed.

[Fig. 10] Fig. 10 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 2 of Embodiment 1 is removed.

[Fig. 11] Fig. 11 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 3 of Embodiment 1 is removed.

[Fig. 12] Fig. 12 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 4 of Embodiment 1 is removed.

[Fig. 13] Fig. 13 is a sectional view of the side panel of the outdoor unit according to Embodiment 1 taken along the line Z-Z of Fig. 12 (state in which a terminal block cover 1f is mounted).

[Fig. 14] Fig. 14 is a side view of a state in which a terminal block cover of an outdoor unit according to Embodiment 2 is removed.

[Fig. 15] Fig. 15 is a sectional view of a side panel of the outdoor unit according to Embodiment 2 taken along the line Z-Z of Fig. 14 (state in which a terminal block cover 1f is mounted).

[Fig. 16] Fig. 16 is a front view of an outdoor unit according to Embodiment 3 of the present invention.

[Fig. 17] Fig. 17 is a top view of the outdoor unit according to Embodiment 3.

[Fig. 18] Fig. 18 is a side view of a state in which a terminal block cover of the outdoor unit according to Embodiment 3 is mounted.

[Fig. 19] Fig. 19 is a sectional view of a side panel of the outdoor unit according to Embodiment 3 taken along the line Z-Z of Fig. 18.

#### Description of Embodiments

**[0013]** An outdoor unit for an air-conditioning apparatus according to the present invention is described below with reference to drawings.

**[0014]** A configuration of the outdoor unit described below is merely an example, and the outdoor unit according to the present invention is not limited to the configuration described below. Further, in the drawings, the

same or similar components are denoted by the same reference signs, or the reference signs for the same or similar components are omitted. Further, the illustration of details in the structure is appropriately simplified or omitted. Further, overlapping description or similar description is appropriately simplified or omitted.

Embodiment 1

**[0015]** An outdoor unit according to Embodiment 1 is described with reference to Fig. 1 to Fig. 5.

<Configuration of Outdoor Unit>

**[0016]** Fig. 1 is a perspective view of the outdoor unit according to Embodiment 1.

**[0017]** Fig. 2 is an exploded perspective view of the outdoor unit according to Embodiment 1.

**[0018]** Fig. 3 is a front view of the outdoor unit according to Embodiment 1.

**[0019]** Fig. 4 is a top view of the outdoor unit according to Embodiment 1.

**[0020]** Fig. 5 is a side view of the outdoor unit according to Embodiment 1.

**[0021]** As illustrated in Fig. 1, a housing 1 of the outdoor unit is formed of sheet metal and have a substantially cuboid shape. As illustrated in Fig. 2 to Fig. 5, the housing 1 mainly includes an L-shaped front panel 1a arranged on a front side of the housing 1, a side panel 1b covering a side surface of the housing 1, a top panel 1c covering an upper surface of the housing 1, and a bottom panel 1d arranged on a bottom surface of the housing 1. Further, a front grille 1e having openings is mounted on the front panel 1a, and a terminal block cover 1f covering electrical components such as a terminal block is mounted on the side panel 1b.

**[0022]** An opening 1h for allowing a power supply wire 11 to pass through the opening 1h is formed at a lower end of the terminal block cover 1f. On an inner side of the terminal block cover 1f, a terminal block 10 to be used to connect power for operating a compressor 2, a fan 4, and other components is arranged. The terminal block 10 is supplied with, for example, three-phase power via the power supply wire 11.

**[0023]** Further, two foot portions 1g for supporting the outdoor unit are arranged on a lower surface of the bottom panel 1d of the housing 1.

**[0024]** The housing 1 accommodates the compressor 2 configured to compress refrigerant, an outdoor heat exchanger 3 configured to exchange heat between outside air and the refrigerant, the fan 4 configured to supply the outside air to the outdoor heat exchanger 3, and a support base 5 for supporting the fan 4, on which a motor for the fan is mounted.

**[0025]** Further, a fan chamber 4a in which the fan 4 is arranged and a machine chamber 2a in which the compressor 2 is arranged are partitioned by a partition plate 6.

**[0026]** The outdoor heat exchanger 3 is a fin-and-tube

heat exchanger in which, for example, heat transfer tubes pass through a plurality of aluminum thin plate-like fins arranged side by side. The outdoor heat exchanger 3 is entirely formed into a substantially L-shape, and is arranged along two side surfaces of the housing 1. The fins are arranged upright in a vertical direction, and the heat transfer tubes pass through the fins in a horizontal direction.

**[0027]** The fan 4 is arranged in the vicinity of the outdoor heat exchanger 3. Rotation of the fan 4 causes the outside air to pass between the fins of the outdoor heat exchanger 3, and at this time, heat is exchanged between the refrigerant flowing through the heat transfer tubes of the outdoor heat exchanger 3 and the outside air. The outside air after the heat exchange is exhausted to an outside of the housing 1 through the front grille 1e.

**[0028]** When such an outdoor unit for an air-conditioning apparatus is operated, for example, during a heating operation, the outdoor heat exchanger 3 acts as an evaporator, and low-pressure gas refrigerant evaporated by receiving heat from the outside air is compressed into high-pressure gas refrigerant by the compressor 2, and is supplied to an indoor heat exchanger of an indoor unit (not shown).

**[0029]** Meanwhile, during a cooling operation, the outdoor heat exchanger 3 acts as a condenser, and high-pressure gas refrigerant compressed by the compressor 2 transfers heat to the outside air and is condensed in the outdoor heat exchanger 3. Then, the condensed liquid refrigerant is decompressed and supplied to the indoor heat exchanger of the indoor unit (not shown).

#### <Configuration around Terminal Block>

**[0030]** Next, the configuration around the terminal block of the outdoor unit according to Embodiment 1 is described with reference to Fig. 6 to Fig. 8.

**[0031]** Fig. 6 is a side view of a state in which the terminal block cover of the outdoor unit according to Embodiment 1 is removed.

**[0032]** Fig. 7 is a side view of a state in which the terminal block cover of the outdoor unit according to Embodiment 1 is mounted.

**[0033]** Fig. 8 is a sectional view of the side panel of the outdoor unit according to Embodiment 1 taken along the line Z-Z of Fig. 6 and Fig. 7.

**[0034]** As illustrated in Fig. 6, the side panel 1b has a rectangular opening portion 15 for allowing the power supply wire 11 to the terminal block 10. The terminal block 10 is arranged inside the opening portion 15.

**[0035]** The side panel 1b includes an outer shell surface 12 forming a part of an outer shell of the housing 1, a first recessed surface 13 recessed by one stage from the outer shell surface 12 toward the inner side of the housing 1, and a second recessed surface 14 further recessed by one stage from the first recessed surface 13 toward the inner side of the housing 1.

**[0036]** The outer shell surface 12, the first recessed

surface 13, and the second recessed surface 14 are formed in parallel to each other. Each two adjacent surfaces of these three surfaces may be connected to each other with a gently inclined surface, or may be connected to each other with a perpendicular connection surface.

**[0037]** The first recessed surface 13 is formed into a rectangular shape including the periphery of the opening portion 15, and extends downward from the opening portion 15.

**[0038]** The second recessed surface 14 is formed within the range of the first recessed surface 13, and is formed into a substantially rectangular shape arranged between the lower end of the opening portion 15 and the lower end of the first recessed surface 13.

**[0039]** At the lower end of the second recessed surface 14, a tapered surface 14a is formed to gently connect the second recessed surface 14 and the outer shell surface 12 to each other.

**[0040]** On the first recessed surface 13, the terminal block cover 1f is mounted so that an inner surface side of the terminal block cover 1f is brought into contact to the first recessed surface 13. As the terminal block cover 1f, a flat plate member or a plate-like member having a protruding circumferential edge on the inner surface side can be adopted.

**[0041]** The terminal block cover 1f is mounted on the first recessed surface 13 with screws or other members, and an outer surface of the terminal block cover 1f and the outer shell surface 12 are arranged to be flush with each other as the same surface. Further, as illustrated in Fig. 5, the lower end of the terminal block cover 1f is positioned not to be overlapped with the tapered surface 14a at the lower end of the second recessed surface 14 in side view, and the side surface of the housing 1 has an opening 1h communicating to the second recessed surface. The terminal block cover 1f is only required to be fitted between the first recessed surface 13 and the outer shell surface 12, and the outer surface of the terminal block cover 1f may be arranged closer to the inner side of the housing 1 than the outer shell surface 12.

**[0042]** As illustrated in Fig. 8, the power supply wire 11 is mounted in contact to the second recessed surface 14 of the side panel 1b. At this time, a fixing member 16 including a recessed portion 16a for receiving the power supply wire 11 is used to sandwich the power supply wire 11 between the second recessed surface of the side panel 1b and the recessed portion 16a of the fixing member 16.

**[0043]** As illustrated in Fig. 6, the power supply wire 11 has one end connected to the terminal block 10, and an other end arranged outside the terminal block cover 1f through downward extension of the power supply wire 11 from the terminal block 10 over the lower portion of the second recessed surface.

**[0044]** The fixing member 16 is formed of a plate-like steel member, a plate-like resin member, or other materials, and has one end 16b mounted to the second recessed surface 14 of the side panel 1b with, for example,

a hinge. Further, an other end 16c of the fixing member 16 is fixed to a screw hole of the second recessed surface 14 with a screw or other member.

**[0045]** As illustrated in Fig. 8, the height of the fixing member 16 in a direction perpendicular to the second recessed surface 14 is a dimension within a distance between the first recessed surface 13 and the second recessed surface 14 so that, when the terminal block cover 1f is mounted, the terminal block cover 1f and the fixing member 16 do not interfere with each other. That is, the fixing member 16 is accommodated between the second recessed surface 14 and the first recessed surface 13.

<Mounting of Power Supply Wire>

**[0046]** When the power supply wire 11 is mounted to the terminal block 10 of the outdoor unit, first, the screws or other members fixing the terminal block cover 1f are removed, and the terminal block cover 1f is removed from the side panel 1b. Next, a screw 16d or other member is removed from the fixing member 16. Then, the power supply wire 11 is placed in the recessed portion 16a of the fixing member 16, and the fixing member 16 is mounted to the side panel 1b again with the screw 16d or other member. Then, the terminal block cover 1f is mounted on the first recessed surface 13 again. At this time, the power supply wire 11 is extended to the outside of the terminal block cover 1f from a clearance secured between the tapered surface 14a, which is formed at a lower portion of the second recessed surface 14, and the terminal block cover 1f.

<Effect>

**[0047]** In the outdoor unit according to Embodiment 1, the height dimension of the fixing member 16 in the direction perpendicular to the second recessed surface 14 is set within the distance between the first recessed surface 13 and the second recessed surface 14, and the second recessed surface 14 is formed so that the terminal block cover 1f and the fixing member 16 do not interfere with each other when the terminal block cover 1f is mounted. Consequently, the housing 1 can be downsized particularly in the width-direction dimension without protrusion of the terminal block cover 1f from the outer shell surface 12 in the side panel 1b of the housing 1.

<Modified Example 1>

**[0048]** Modified Examples 1 to 3 of the configuration around the terminal block of the outdoor unit according to Embodiment 1 are described with reference to Fig. 9 to Fig. 11.

**[0049]** Fig. 9 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 1 of Embodiment 1 is removed.

**[0050]** In Embodiment 1, the second recessed surface

14 of the side panel 1b is formed into a linear shape extending downward from the opening portion 15, but Modified Example 1 of Fig. 9 is an example in which the second recessed surface 14 is formed to horizontally extend from the opening portion 15 in a back surface direction of the housing 1. The fixing member 16 for the power supply wire 11 is arranged to sandwich the power supply wire 11 in the second recessed surface 14 in a lateral direction. Further, the terminal block cover 1f is arranged in contact to the first recessed surface similarly to the case of Embodiment 1, and the terminal block cover 1f is arranged not to be overlapped with the tapered surface 14a of the second recessed surface 14 in side view. The terminal block cover 1f has the opening 1h through which the power supply wire 11 is communicated to the second recessed surface 14.

<Effect>

**[0051]** In the outdoor unit according to Modified Example 1, in addition to the effect of the outdoor unit according to Embodiment 1, the power supply wire 11 can be extended linearly in the back surface direction of the housing 1. Thus, the power supply wire can be smoothly connected when the power supply is located on the back surface side of the housing 1.

<Modified Examples 2 and 3>

**[0052]** Fig. 10 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 2 of Embodiment 1 is removed.

**[0053]** Fig. 11 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 3 of Embodiment 1 is removed.

**[0054]** In Embodiment 1, the second recessed surface 14 of the side panel 1b is formed into a linear shape extending downward from the opening portion 15, but Modified Examples 2 and 3 are examples in which, as illustrated in Fig. 10 and Fig. 11, the second recessed surface 14 is formed into an L-shape. The L-shape is obtained by forming the second recessed surface 14 extending downward from the opening portion 15 and then bending the second recessed surface 14 in the back surface direction of the housing 1. The fixing member 16 of the power supply wire 11 is arranged to sandwich the power supply wire 11 in the second recessed surface 14 in a vertical direction (Modified Example 2) or in a horizontal direction (Modified Example 3).

**[0055]** Further, the terminal block cover 1f is arranged in contact to the first recessed surface similarly to the case of Embodiment 1, and is arranged not to be overlapped with the tapered surface 14a of the second recessed surface 14 in side view. The terminal block cover 1f has the opening 1h through which the power supply wire 11 is communicated to the second recessed surface 14.

<Effect>

[0056] In the outdoor units according to Modified Examples 2 and 3, in addition to the effect of the outdoor unit according to Embodiment 1, the power supply wire 11 can be bent into an L-shape to be extended in the back surface direction of the housing 1. Thus, even when a pulling force acts on the power supply wire 11, the bent part may be deformed to absorb the pulling force, and thus the power supply wire 11 can be prevented from coming off from the terminal block 10.

<Modified Example 4>

[0057] Fig. 12 is a side view of a state in which the terminal block cover of the outdoor unit according to Modified Example 4 of Embodiment 1 is removed.

[0058] Fig. 13 is a sectional view of the side panel of the outdoor unit according to Embodiment 1 taken along the line Z-Z of Fig. 12 (state in which the terminal block cover 1f is mounted).

[0059] In Embodiment 1, the first recessed surface 13 of the side panel 1b has an independent rectangular shape, but Modified Example 4 is an example in which, as illustrated in Fig. 12, the first recessed surface 13 is formed from the periphery of the opening portion 15 to the lower end of the side panel 1b, and the second recessed surface 14 is formed in the first recessed surface 13 and extends to the lower end of the side panel 1b. The fixing member 16 for the power supply wire 11 is arranged to sandwich the power supply wire 11 in the second recessed surface 14 in the vertical direction.

<Effect>

[0060] In the outdoor unit according to Modified Example 4, in addition to the effect of the outdoor unit according to Embodiment 1, the power supply wire 11 can be extended to the lower end of the side panel 1b. Thus, the power supply wire can be smoothly connected when the power supply is located on the bottom surface side of the housing 1. Further, the terminal block cover 1f is mounted down to the lower end of the side panel 1b, and hence the housing 1 can have a flat side surface, leading to improvement in design.

Embodiment 2

[0061] The fixing member 16 of the outdoor unit according to Embodiment 1 is mounted on the second recessed surface 14 that is recessed by two stages from the outer shell surface 12 with a screw or other member, but Embodiment 2 differs from Embodiment 1 in the mounting location of the fixing member 16.

<Configuration around Terminal Block>

[0062] The configuration around a terminal block of an

outdoor unit according to Embodiment 2 is described with reference to Fig. 14 and Fig. 15. Description of configurations common to Embodiment 1 is omitted as appropriate.

[0063] Fig. 14 is a side view of a state in which the terminal block cover of the outdoor unit according to Embodiment 2 is removed.

[0064] Fig. 15 is a sectional view of a side panel of the outdoor unit according to Embodiment 2 taken along the line Z-Z of Fig. 14 (state in which the terminal block cover 1f is mounted).

[0065] As illustrated in Fig. 14, the side panel 1b includes, similarly to the case of Embodiment 1, the outer shell surface 12 forming the part of the outer shell of the housing 1, the first recessed surface 13 recessed by one stage from the outer shell surface 12 toward the inner side of the housing 1, and the second recessed surface 14 further recessed by one stage from the first recessed surface 13 toward the inner side of the housing 1.

[0066] The first recessed surface 13 is formed into a rectangular shape including the periphery of the opening portion 15, and extends downward from the opening portion 15.

[0067] The second recessed surface 14 is formed within the range of the first recessed surface 13, and is formed into a substantially rectangular shape arranged between the lower end of the opening portion 15 and the lower end of the first recessed surface 13.

[0068] At the lower end of the second recessed surface 14, the tapered surface 14a is formed to gently connect the second recessed surface 14 and the outer shell surface 12 to each other.

[0069] As illustrated in Fig. 15, on the first recessed surface 13, the terminal block cover 1f is mounted so that the inner surface side of the terminal block cover 1f is brought into contact to the first recessed surface 13. As the terminal block cover 1f, a flat plate member or a plate-like member having a protruding circumferential edge on the inner surface side can be adopted.

[0070] The terminal block cover 1f is mounted on the first recessed surface 13 with screws or other members, and the outer surface of the terminal block cover 1f and the outer shell surface 12 are arranged to be flush with each other as the same surface. The terminal block cover 1f is only required to be fitted between the first recessed surface 13 and the outer shell surface 12, and the outer surface of the terminal block cover 1f may be arranged closer to the inner side of the housing 1 than the outer shell surface 12.

[0071] As illustrated in Fig. 15, the power supply wire 11 is mounted in contact to the second recessed surface 14 of the side panel 1b. At this time, a fixing member 17 having a flat plate shape is used to sandwich the power supply wire 11 between the second recessed surface 14 of the side panel 1b and an inner surface side of the fixing member 17.

[0072] As illustrated in Fig. 14, the power supply wire 11 has the one end connected to the terminal block 10,

and the other end arranged outside the terminal block cover 1f through downward extension of the power supply wire 11 from the terminal block 10 over the lower portion of the second recessed surface.

**[0073]** The fixing member 17 is formed of a plate-like steel member, a plate-like resin member, or other materials, and has one end 17a and an other end 17b fixed to screw holes of the first recessed surface 13 with screws 17c or other members. Further, the fixing member 17 is accommodated between the first recessed surface 13 and the outer shell surface 12.

#### <Mounting of Power Supply Wire>

**[0074]** When the power supply wire 11 is mounted to the terminal block 10 of the outdoor unit, first, the screws or other members fixing the terminal block cover 1f are removed, and the terminal block cover 1f is removed from the side panel 1b. Next, the screws 17c or other members are removed from the fixing member 17. Then, the power supply wire 11 is placed on the second recessed surface 14, and the fixing member 17 is mounted to the side panel 1b again with the screws 17c or other members. Then, the terminal block cover 1f is mounted on the first recessed surface 13 again. At this time, the power supply wire 11 is extended to the outside of the terminal block cover 1f from a clearance secured between the tapered surface 14a, which is formed at the lower portion of the second recessed surface 14, and the terminal block cover 1f.

#### <Effect>

**[0075]** In the outdoor unit according to Embodiment 2, the fixing member 17 is formed into a flat plate shape to reduce the height dimension of the fixing member 17 in the direction perpendicular to the second recessed surface 14, and the outer surface side of the terminal block cover 1f is arranged to be flush with the outer shell surface 12 of the side panel 1b when the terminal block cover 1f is mounted. Consequently, the housing 1 can be downsized particularly in the width-direction dimension without protrusion of the terminal block cover 1f from the outer shell surface 12 in the side panel 1b of the housing 1.

**[0076]** The outdoor unit according to Embodiment 2 may adopt the configurations of Modified Examples 1 to 4 according to Embodiment 1, to thereby lead out the power supply wire 11 in a desired direction.

#### Embodiment 3

**[0077]** An outdoor unit according to Embodiment 3, which is according to the present invention differs from the outdoor units according to Embodiments 1 and 2 in the shape of the side panel 1b, and hence this point is mainly described. Description of configurations common to Embodiments 1 and 2 is omitted as appropriate.

#### <Configuration around Terminal Block>

**[0078]** The configuration around the terminal block of the outdoor unit according to Embodiment 3 is described with reference to Fig. 16 to Fig. 19.

**[0079]** Fig. 16 is a front view of the outdoor unit according to Embodiment 3.

**[0080]** Fig. 17 is a top view of the outdoor unit according to Embodiment 3.

**[0081]** Fig. 18 is a side view of a state in which the terminal block cover of the outdoor unit according to Embodiment 3 is mounted.

**[0082]** Fig. 19 is a sectional view of the side panel of the outdoor unit according to Embodiment 3 taken along the line Z-Z of Fig. 18.

**[0083]** The housing 1 of the outdoor unit according to Embodiment 3 has a basic configuration as illustrated in Fig. 16 to Fig. 18, which is the same configuration as the outdoor units according to Embodiments 1 and 2.

**[0084]** However, as illustrated in Fig. 19, a sectional shape of the side panel 1b is different.

**[0085]** That is, in Embodiments 1 and 2, as illustrated in Fig. 8, Fig. 13, and Fig. 15, the side panel 1b is formed into a terraced mortar shape from both sides with the outer shell surface 12 forming the part of the outer shell of the housing 1, the first recessed surface 13 recessed by one stage from the outer shell surface 12 toward the inner side of the housing 1, and the second recessed surface 14 further recessed by one stage from the first recessed surface 13 toward the inner side of the housing 1. In Embodiment 3, as illustrated in Fig. 19, the outer shell surface 12 is not present on the front surface side of the housing 1 (left side in the drawing sheet), and the front surface side of the housing 1 is connected by being bent toward the front panel 1a side from the first recessed surface 13.

**[0086]** Similarly to Embodiments 1 and 2, the outer shell surface 12, the first recessed surface 13, and the second recessed surface 14 are formed in parallel to each other. Each two adjacent surfaces of these three surfaces may be connected to each other with a gently inclined surface, or may be connected to each other with a perpendicular connection surface.

**[0087]** The first recessed surface 13 is formed into a rectangular shape including the periphery of the opening portion 15, and extends downward from the opening portion 15.

**[0088]** On the first recessed surface 13, the terminal block cover 1f is mounted so that the inner surface side of the terminal block cover 1f is brought into contact to the first recessed surface 13. As the terminal block cover 1f, a flat plate member or a plate-like member having a protruding circumferential edge on the inner surface side can be adopted. As illustrated in Fig. 18, the terminal block cover 1f is extended down to the lower end of the side panel 1b.

**[0089]** The terminal block cover 1f is arranged to be fitted between the first recessed surface 13 and the outer

shell surface 12. At this time, the outer surface of the terminal block cover 1f and the outer shell surface 12 may be arranged to be flush with each other as the same surface, or the outer surface of the terminal block cover 1f may be arranged closer to the inner side of the housing 1 than the outer shell surface 12.

[0090] As illustrated in Fig. 19, the power supply wire 11 is mounted in contact to the second recessed surface 14 of the side panel 1b. At this time, the fixing member 16 including the recessed portion 16a for receiving the power supply wire 11 is used to sandwich the power supply wire 11 between the second recessed surface of the side panel 1b and the recessed portion 16a of the fixing member 16.

[0091] The power supply wire 11 has the one end connected to the terminal block 10, and the other end arranged outside the terminal block cover 1f through downward extension of the power supply wire 11 from the terminal block 10 over the lower portion of the second recessed surface.

[0092] The height of the fixing member 16 in the direction perpendicular to the second recessed surface 14 is a dimension that enables the fixing member 16 to be accommodated inside the terminal block cover 1f, which is a plate-like member having a protruding circumferential edge as illustrated in Fig. 19. Further, the outer surface of the terminal block cover 1f is formed not to protrude to the outside from the outer shell surface 12 of the side panel 1b.

[0093] Further, similarly to Embodiment 1, the height of the fixing member 16 in the direction perpendicular to the second recessed surface 14 may be a dimension within the distance between the first recessed surface 13 and the second recessed surface 14 so that, when the flat plate-shaped terminal block cover 1f is mounted, the terminal block cover 1f and the fixing member 16 do not interfere with each other.

<Effect>

[0094] In the outdoor unit according to Embodiment 3, as illustrated in Fig. 19, even when the outer shell surface 12 is not present on the front side (left side in the drawing) of the housing 1, the power supply wire 11 and the fixing member 16 may be arranged on the second recessed surface 14. Thus, the housing 1 can be downsized particularly in the width-direction dimension without protrusion of the outer surface of the terminal block cover 1f from the outer shell surface 12 in the side panel 1b. Consequently, the side panel 1b can be shaped in many variations, and the outdoor unit can be improved in design.

[0095] The shape of the side panel 1b according to Embodiment 3 is applicable to the configurations of the outdoor units according to Embodiments 1 and 2.

Reference Signs List

[0096] 1 housing 1a front panel 1b side panel 1c top

panel 1d bottom panel 1e front grille 1f terminal block cover 1g foot portion 1h opening 2 compressor 2a machine chamber 3 outdoor heat exchanger 4 fan 4a fan chamber 5 support base 6 partition plate 10 terminal block 11 power supply wire 12 outer shell surface 13 first recessed surface 14 second recessed surface 14a tapered surface 15 opening portion 16 fixing member 16a recessed portion 16b one end 16c other end 16d screw 17 fixing member 17a one end 17b other end 17c screw

Claims

1. An outdoor unit, comprising:

a housing (1) including a side panel (1b) and a front panel (1a) connected to the side panel (1b); and  
a terminal block (10) accommodated in the housing (1),  
the side panel (1b) including  
an outer shell surface (12) forming a part of an outer surface of the housing (1),  
a first recessed surface (13) recessed from the outer shell surface (12) in an inward direction of the housing (1), and  
a second recessed surface (14) formed in the first recessed surface (13) and recessed from the first recessed surface (13) in the inward direction of the housing (1),  
on the second recessed surface (14), a power supply wire (11) connected to the terminal block (10) being arranged,  
**characterized in that**  
the first recessed surface (13) has a side connected to the front panel (1a),  
the outer shell surface (12) is not present on a front surface side of the housing (1), and  
the front panel (1a) of the housing (1) is connected to the side of the first recessed surface (13) by the front panel (1a) being bent from the front panel (1a) toward the side of the first recessed surface (13).

2. The outdoor unit of claim 1, wherein the side panel (1b) includes a terminal block cover (1f) configured to cover the terminal block (10), the terminal block cover (1f) being mounted to be accommodated between the first recessed surface (13) and the outer shell surface (12).

3. The outdoor unit of claim 2, wherein the terminal block cover (1f) is mounted on the first recessed surface (13) in contact to the first recessed surface (13).

4. The outdoor unit of claim 2 or 3, wherein the terminal block cover (1f) has an outer surface arranged to be flush with the outer shell surface (12).



5. The outdoor unit of any one of claims 1 to 4, further comprising a fixing member (16) configured to fix the power supply wire (11) to the side panel (1b), the fixing member (16) being mounted on the second recessed surface (14).
6. The outdoor unit of claim 5, wherein the fixing member (16) is accommodated between the second recessed surface (14) and the first recessed surface (13).
7. The outdoor unit of any one of claims 1 to 4, further comprising a fixing member (17) configured to fix the power supply wire (11) to the side panel (1b), the fixing member (17) being mounted on the first recessed surface (13).
8. The outdoor unit of claim 7, wherein the fixing member (17) is accommodated between the first recessed surface (13) and the outer shell surface (12).

#### Patentansprüche

##### 1. Außeneinheit, umfassend:

ein Gehäuse (1), aufweisend eine Seitenplatte (1b) und eine Vorderplatte (1a), die mit der Seitenplatte (1b) verbunden ist; und eine Klemmleiste (10), die im Gehäuse (1) untergebracht ist, wobei die Seitenplatte (1b) aufweist eine Außenmantelfläche (12), die einen Teil einer Außenfläche des Gehäuses (1) bildet, eine erste vertiefte Oberfläche (13), die von der Außenmantelfläche (12) in eine nach innen gerichtete Richtung des Gehäuses (1) vertieft ist, und eine zweite vertiefte Oberfläche (14), die in der ersten vertieften Oberfläche (13) ausgebildet ist und von der ersten vertieften Oberfläche (13) in eine nach innen gerichtete Richtung des Gehäuses (1) vertieft ist, wobei auf der zweiten vertieften Oberfläche (14) eine Energieversorgungsleitung (11), die mit der Klemmleiste (10) verbunden ist, angeordnet ist, **dadurch gekennzeichnet, dass** die erste vertiefte Oberfläche (13) eine Seite aufweist, die mit der Vorderplatte (1a) verbunden ist, die Außenmantelfläche (12) nicht auf einer Vorderflächenseite des Gehäuses (1) vorhanden ist, und die Vorderplatte (1a) des Gehäuses (1) dadurch mit der Seite der ersten vertieften Oberfläche (13) verbunden ist, dass die Vorderplatte (1a) von der Vorderplatte (1a) in Richtung der Seite der ersten vertieften Oberfläche (13) gebogen

ist.

2. Außeneinheit nach Anspruch 1, wobei die Seitenplatte (1b) eine Klemmleistenabdeckung (1f) aufweist, die eingerichtet ist, die Klemmleiste (10) abzudecken, wobei die Klemmleistenabdeckung (1f) befestigt ist, um zwischen der ersten vertieften Oberfläche (13) und der Außenmantelfläche (12) untergebracht zu sein.
3. Außeneinheit nach Anspruch 2, wobei die Klemmleistenabdeckung (1f) auf der ersten vertieften Oberfläche (13) in Kontakt mit der ersten vertieften Oberfläche (13) befestigt ist.
4. Außeneinheit nach Anspruch 2 oder 3, wobei die Klemmleistenabdeckung (1f) eine Außenoberfläche aufweist, die angeordnet ist, um bündig mit der Außenmanteloberfläche (12) zu sein.
5. Außeneinheit nach einem der Ansprüche 1 bis 4, ferner umfassend ein Fixierungselement (16), das eingerichtet ist, die Energieversorgungsleitung (11) an der Seitenplatte (1b) zu fixieren, wobei das Fixierungselement (16) auf der zweiten vertieften Oberfläche (14) befestigt ist.
6. Außeneinheit nach Anspruch 5, wobei das Fixierungselement (16) zwischen der zweiten vertieften Oberfläche (14) und der ersten vertieften Oberfläche (13) untergebracht ist.
7. Außeneinheit nach einem der Ansprüche 1 bis 4, ferner umfassend ein Fixierungselement (17), das eingerichtet ist, die Energieversorgungsleitung (11) an der Seitenplatte (1b) zu fixieren, wobei das Fixierungselement (17) auf der ersten vertieften Oberfläche (13) befestigt ist.
8. Außeneinheit nach Anspruch 7, wobei das Fixierungselement (17) zwischen der ersten vertieften Oberfläche (13) und der Außenmantelfläche (12) untergebracht ist.

#### Revendications

##### 1. Unité extérieure comprenant :

un boîtier (1) comprenant un panneau latéral (1b) et un panneau avant (1a) raccordé au panneau latéral (1b) ; et un bloc de bornes (10) logé dans le boîtier (1), le panneau latéral (1b) comprenant :

une surface de coque externe (12) formant une partie d'une surface externe du boîtier (1),

- une première surface évidée (13) évidée à partir de la surface de coque externe (12) dans une direction vers l'intérieur du boîtier (1), et  
 une seconde surface évidée (14) formée dans la première surface évidée (13) et évidée à partir de la première surface évidée (13) dans la direction vers l'intérieur du boîtier (1),
- sur la seconde surface évidée (14), on agence un fil d'alimentation (11) raccordé au bloc de bornes (10),
- caractérisée en ce que :**
- la première surface évidée (13) a un côté raccordé au panneau avant (1a),  
 la surface de coque externe (12) n'est pas présente sur un côté de surface avant du boîtier (1), et  
 le panneau avant (1a) du boîtier (1) est raccordé au côté de la première surface évidée (13) par le panneau avant (1a) qui est plié à partir du panneau avant (1a) vers le côté de la première surface évidée (13).
2. Unité extérieure selon la revendication 1, dans laquelle le panneau latéral (1b) comprend un couvercle de bloc de bornes (1f) configuré pour recouvrir le bloc de bornes (10), le couvercle de bloc de bornes (1f) étant monté pour être logé entre la première surface évidée (13) et la surface de coque externe (12).
3. Unité extérieure selon la revendication 2, dans laquelle le couvercle de bloc de bornes (1f) est monté sur la première surface évidée (13) en contact avec la première surface évidée (13).
4. Unité extérieure selon la revendication 2 ou 3, dans laquelle le couvercle de bloc de bornes (1f) a une surface externe agencée pour être de niveau avec la surface de coque externe (12).
5. Unité extérieure selon l'une quelconque des revendications 1 à 4, comprenant en outre un élément de fixation (16) configuré pour fixer le fil d'alimentation (11) au panneau latéral (1b), l'élément de fixation (16) étant monté sur la seconde surface évidée (14).
6. Unité extérieure selon la revendication 5, dans laquelle l'élément de fixation (16) est logé entre la seconde surface évidée (14) et la première surface évidée (13).
7. Unité extérieure selon l'une quelconque des revendications 1 à 4, comprenant en outre un élément de fixation (17) configuré pour fixer le fil d'alimentation (11) au panneau latéral (1b), l'élément de fixation
- (17) étant monté sur la première surface évidée (13).
8. Unité extérieure selon la revendication 7, dans laquelle l'élément de fixation (17) est logé entre la première surface évidée (13) et la surface de coque externe (12).

FIG. 1

KPO-2165 (639223/IS01)

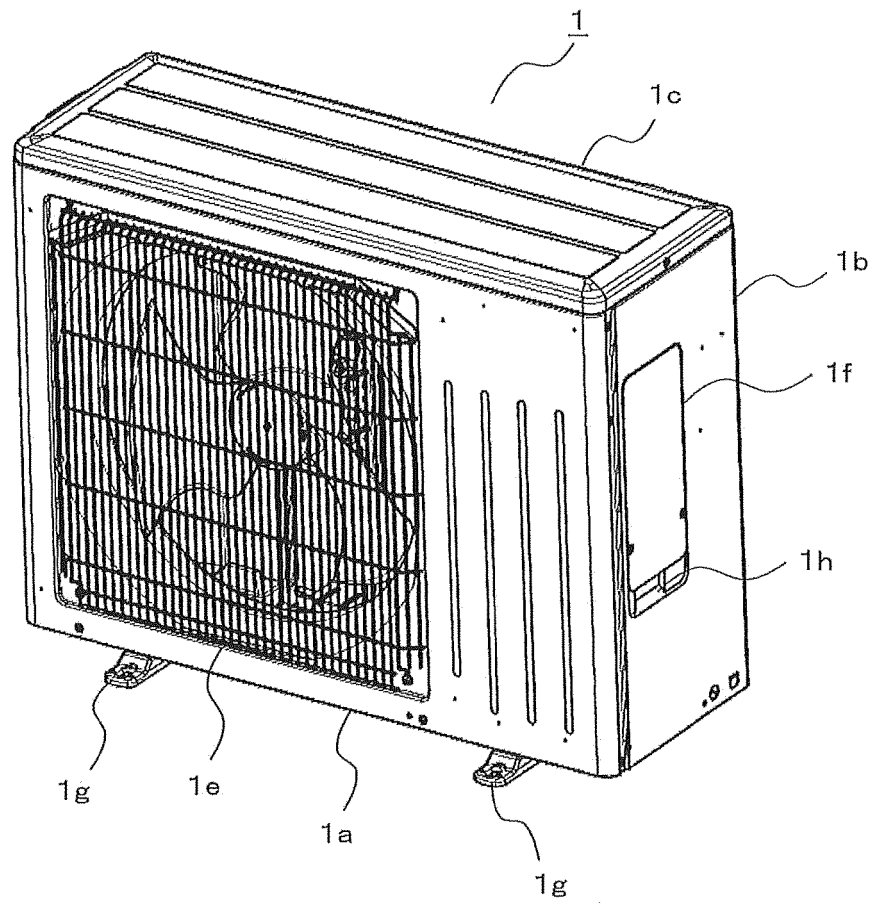


FIG. 2

KPO 2165 (639223US01)

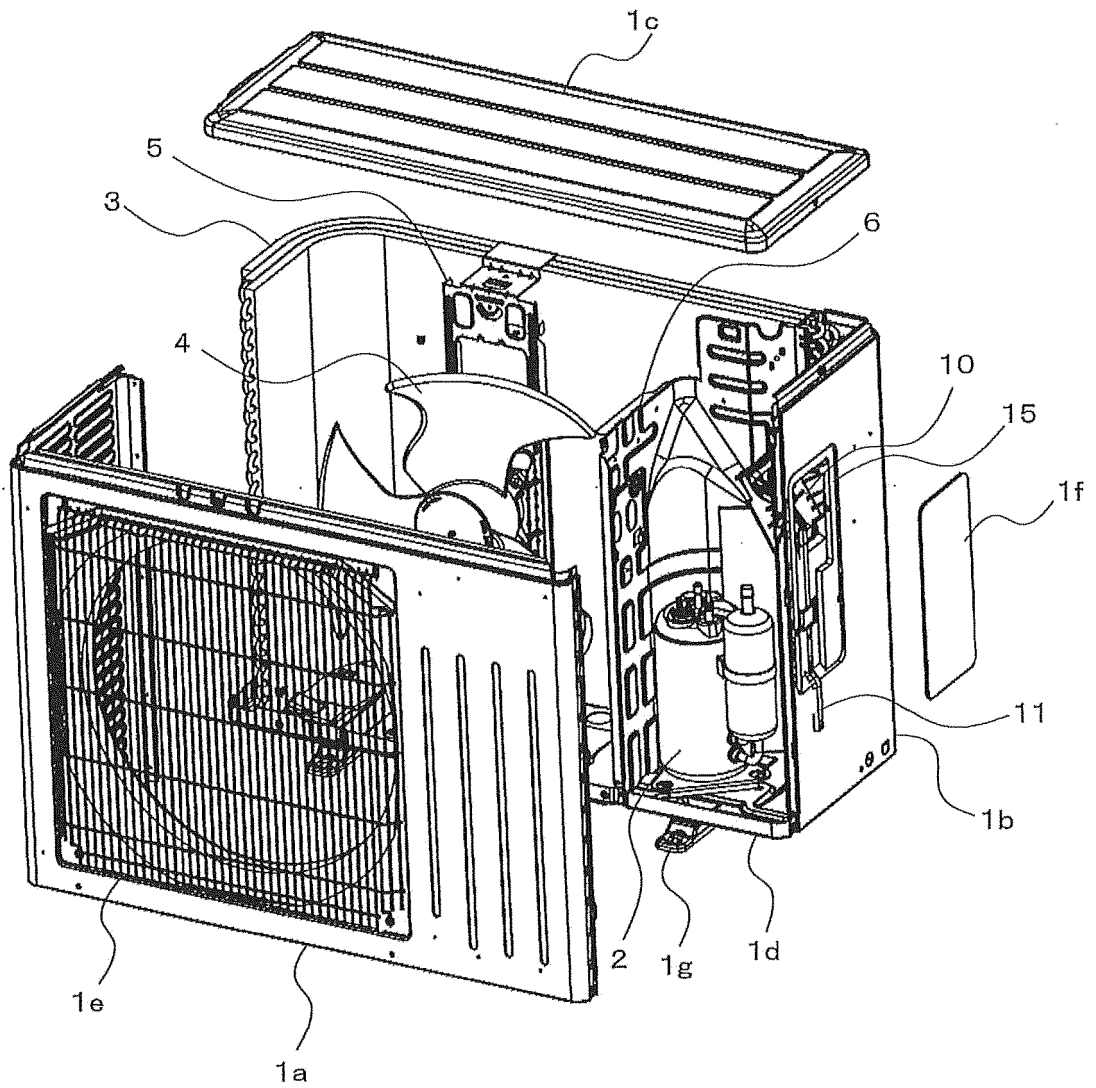


FIG. 3

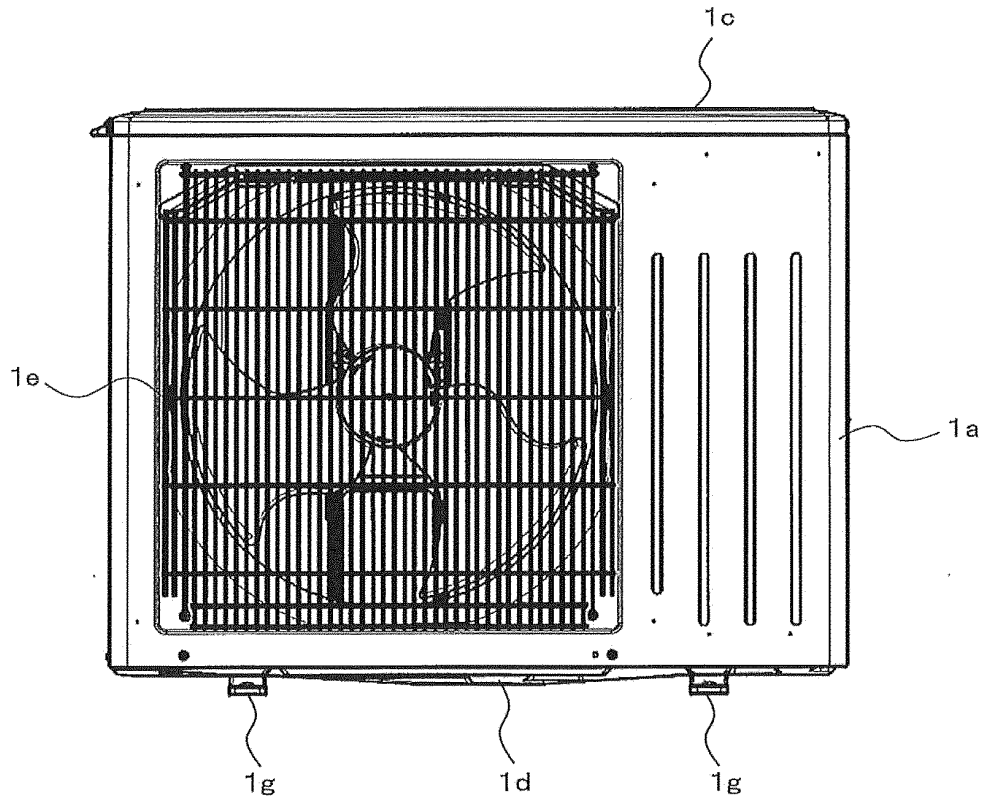


FIG. 4

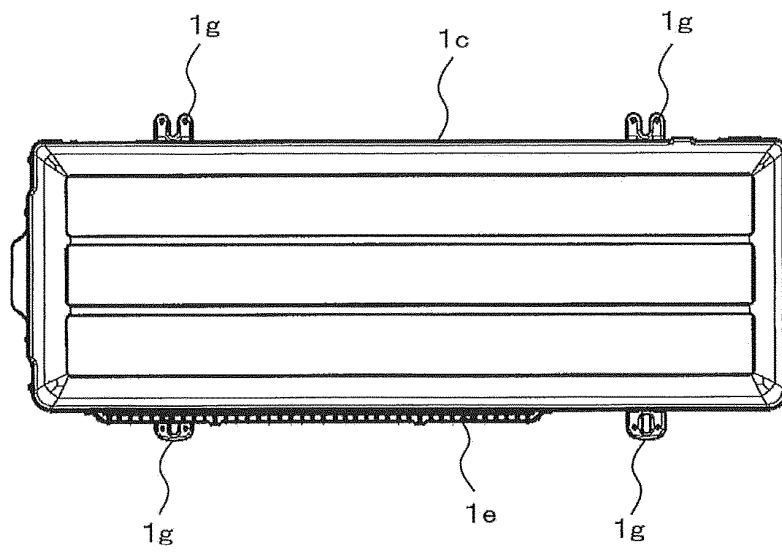


FIG. 5

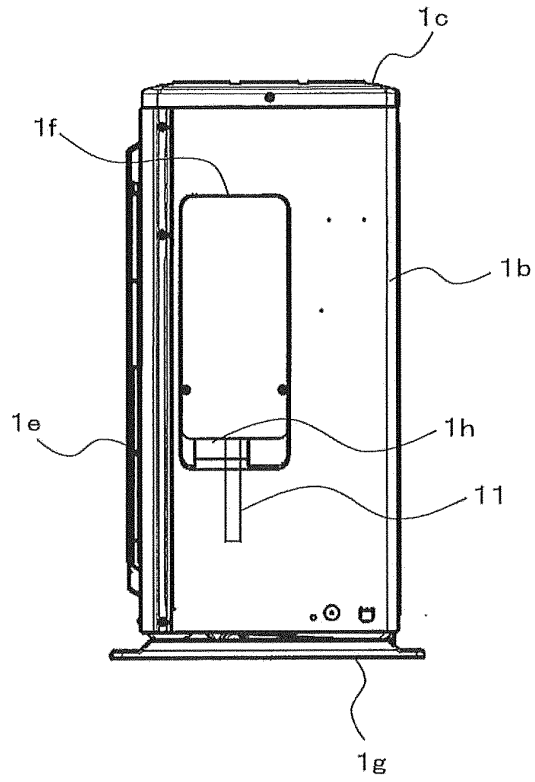


FIG. 6

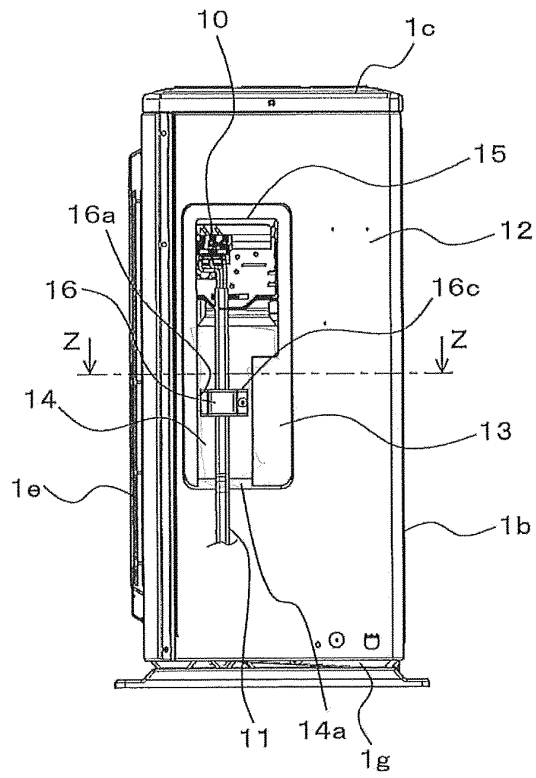


FIG. 7

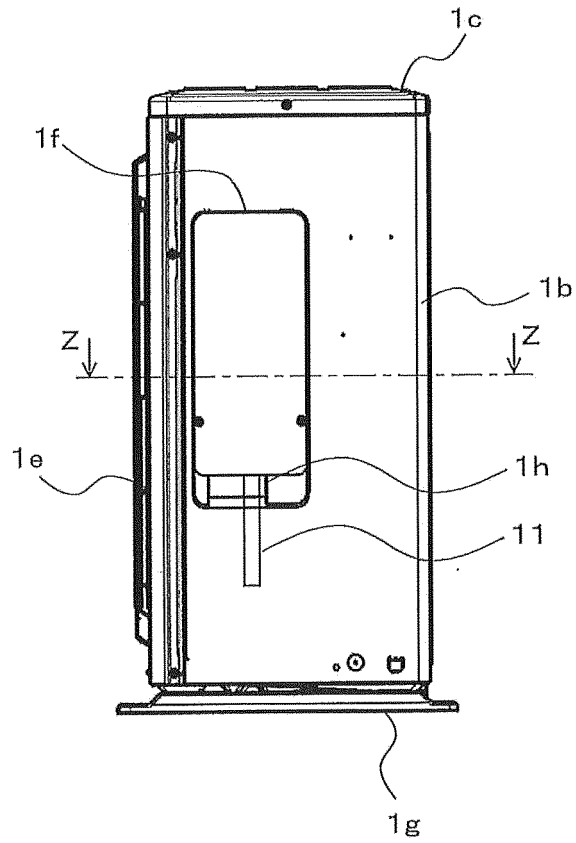


FIG. 8

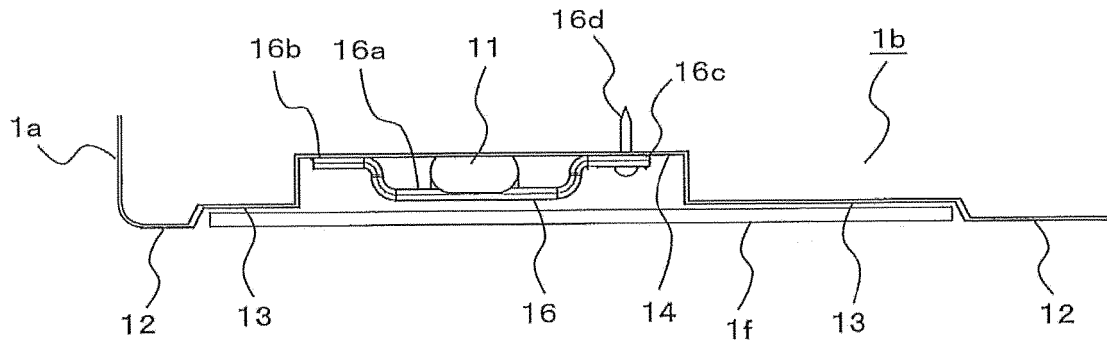


FIG. 9

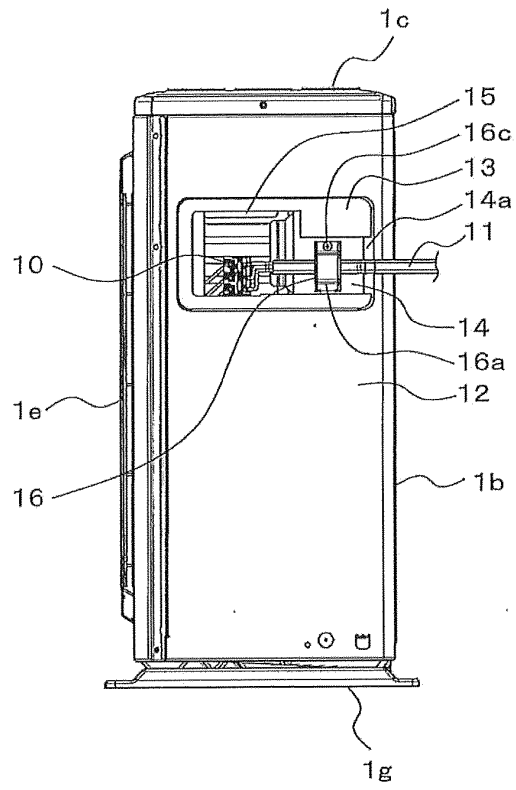


FIG. 10

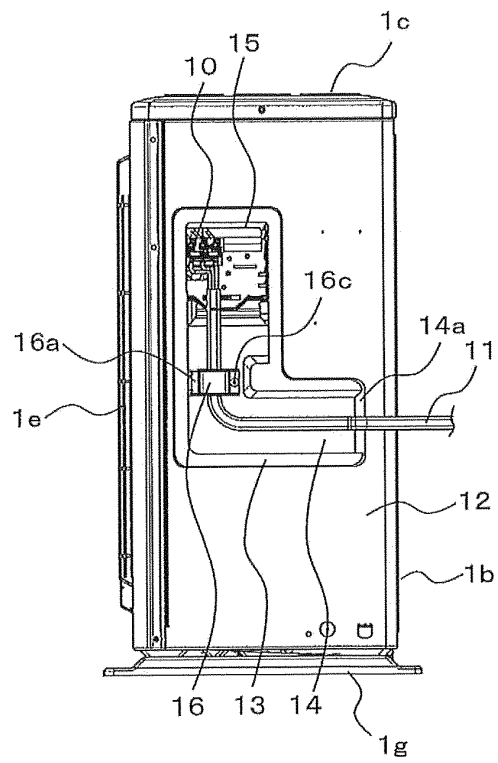




FIG. 11

KPO 2165 (639223U501)

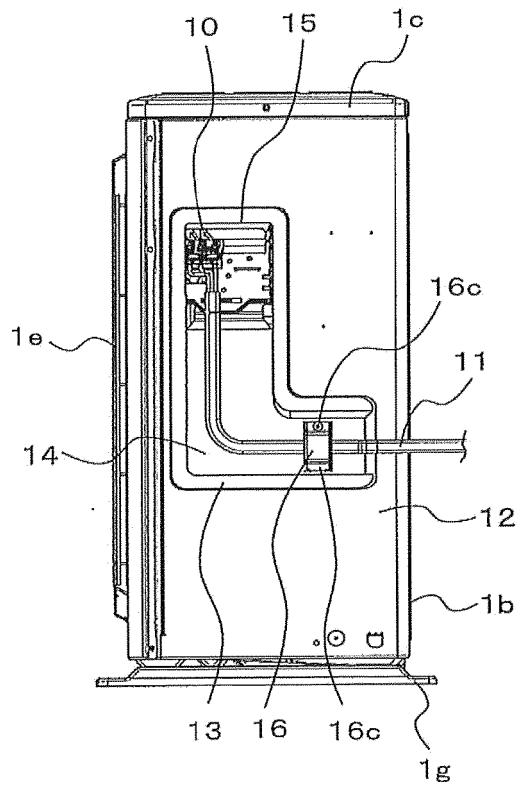


FIG. 12

KPO-2165 (639223/US01)

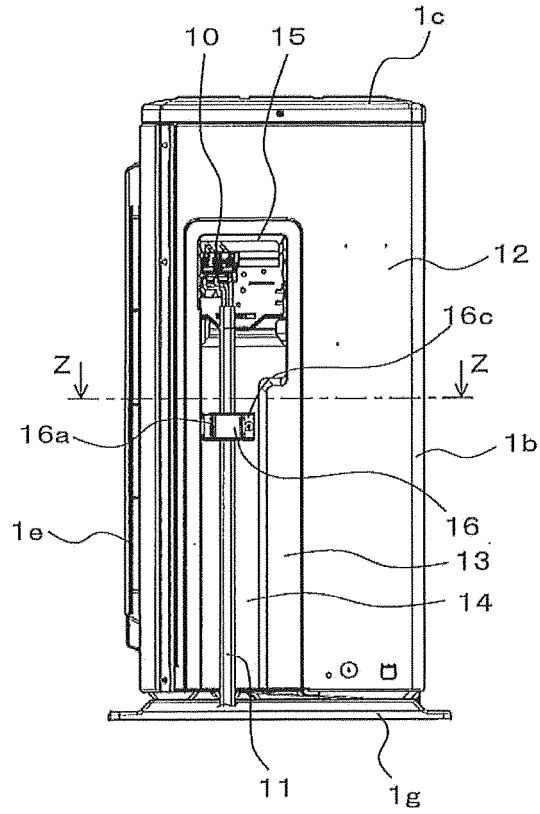


FIG. 13

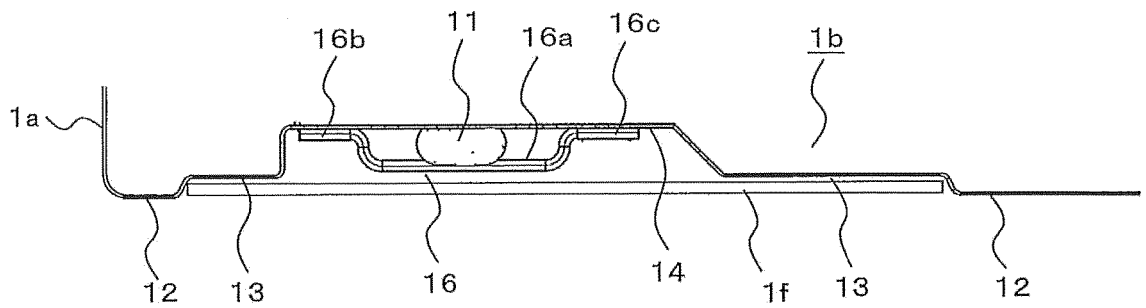


FIG. 14

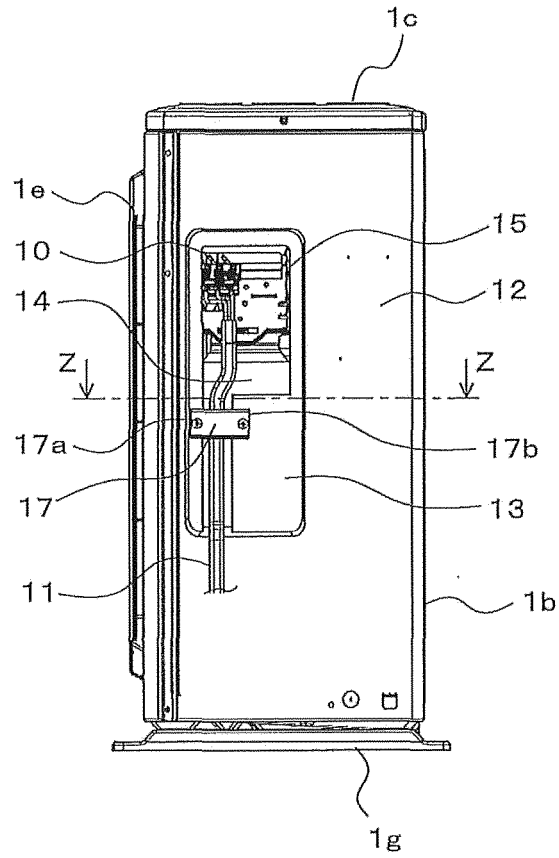


FIG. 15

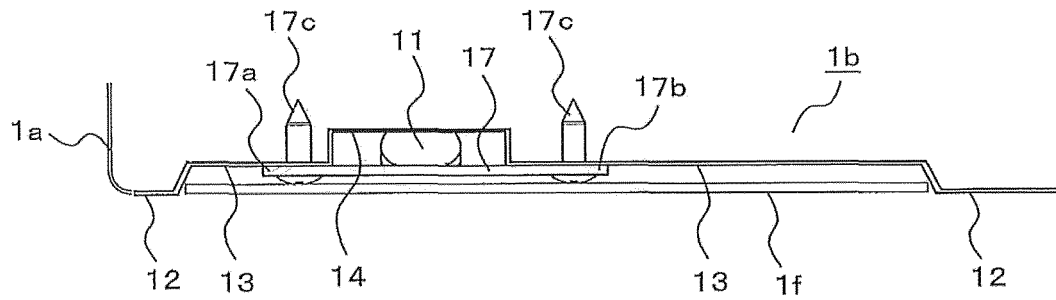


FIG. 16

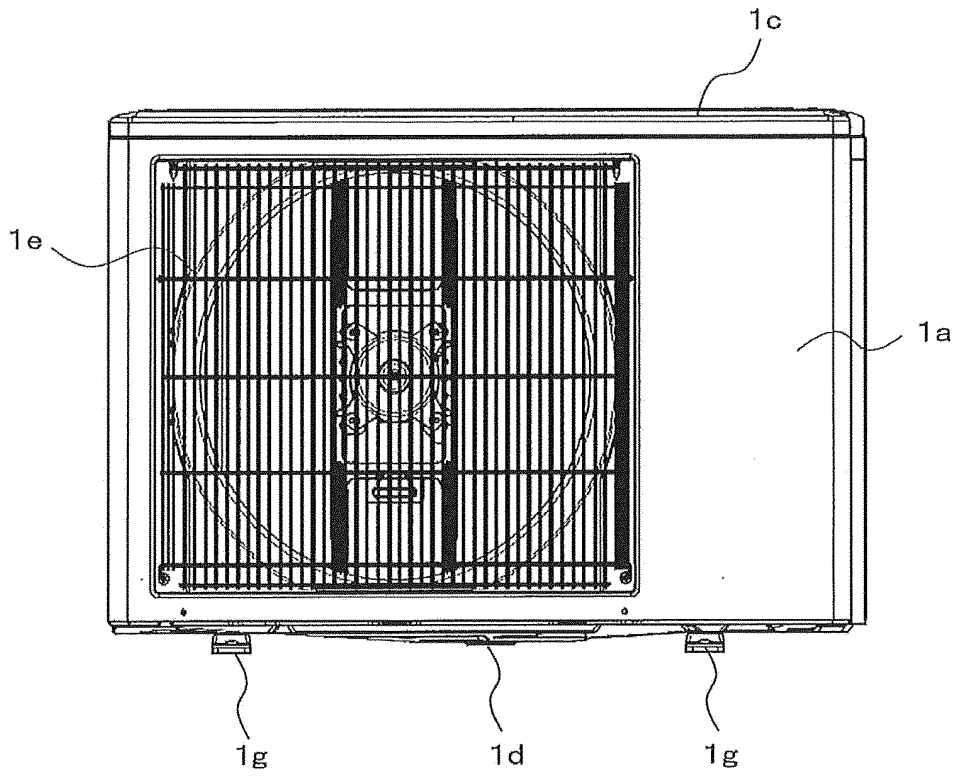


FIG. 17

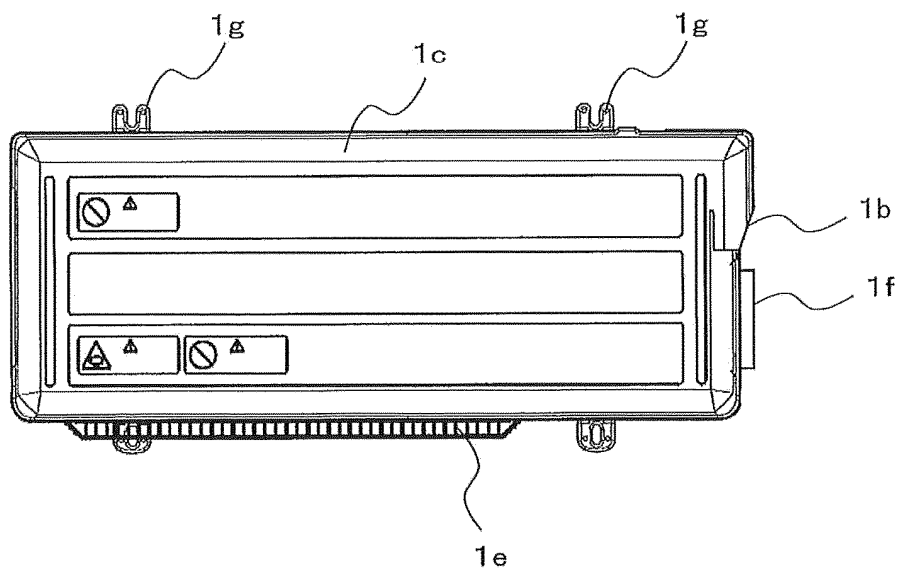


FIG. 18

KPO 2.165 (63922311801)

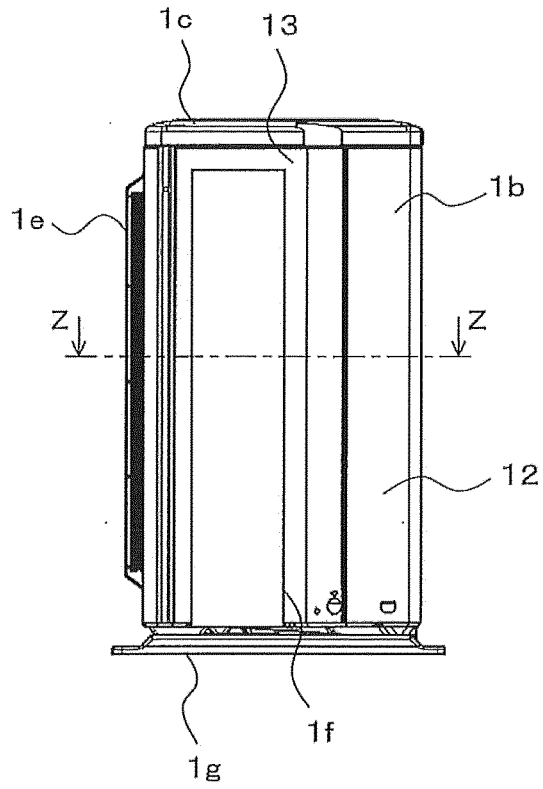
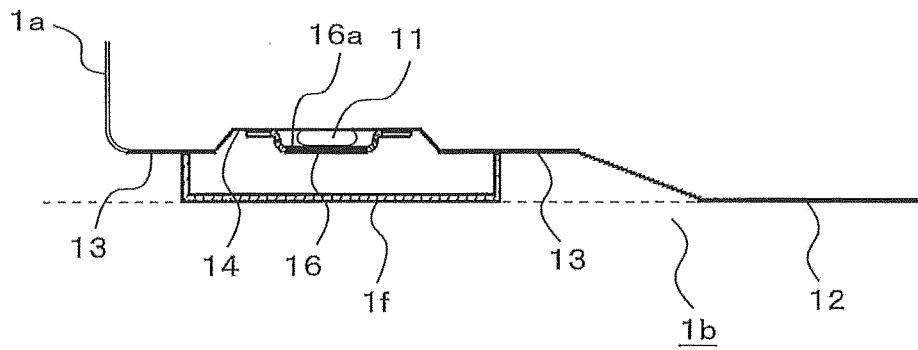


FIG. 19



**REFERENCES CITED IN THE DESCRIPTION**

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