



(11)

EP 2 871 427 B1

(12)

## EUROPEAN PATENT SPECIFICATION

(45) Date of publication and mention of the grant of the patent:  
18.12.2019 Bulletin 2019/51

(51) Int Cl.:  
**F24F 1/06 (2011.01)** **F24F 1/26 (2011.01)**  
**F24F 11/00 (2018.01)**

(21) Application number: 14190909.3

(22) Date of filing: 29.10.2014

(54) **Outdoor unit for air-conditioning device**

Außeneinheit und Klimaanlagenvorrichtung

Unité extérieure pour dispositif de climatisation

## (84) Designated Contracting States:

**AL AT BE BG CH CY CZ DE DK EE ES FI FR GB  
GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO  
PL PT RO RS SE SI SK SM TR**

(30) Priority: 07.11.2013 JP 2013231388

(43) Date of publication of application:  
13.05.2015 Bulletin 2015/20

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

## (72) Inventors:

- Yamaguchi, Koji  
Tokyo, 100-8310 (JP)
- Yamashita, Tetsuo  
Tokyo, 100-8310 (JP)

- Hatta, Masatomo  
Tokyo, 100-8310 (JP)
- Ishii, Minoru  
Tokyo, 100-8310 (JP)
- Morioka, Reiji  
Tokyo, 100-8310 (JP)
- Tazawa, Tetsuya  
Tokyo, 102-0073 (JP)

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

## (56) References cited:

<b>WO-A1-2013/051166</b>	<b>WO-A1-2013/088713</b>
<b>JP-A- 2008 096 018</b>	<b>JP-A- 2011 052 941</b>
<b>KR-B1- 100 795 605</b>	

Note: Within nine months of the publication of the mention of the grant of the European patent in the European Patent Bulletin, any person may give notice to the European Patent Office of opposition to that patent, in accordance with the Implementing Regulations. Notice of opposition shall not be deemed to have been filed until the opposition fee has been paid. (Art. 99(1) European Patent Convention).

**Description**

## [Technical Field]

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

## [Background Art]

**[0002]** In heat pump air-conditioning devices, during a heating operation in which an outdoor heat exchanger serves as an evaporator, heat exchange may be interrupted due to frost formed on the outdoor heat exchanger. Accordingly, heat pump air-conditioning devices have conventionally been proposed which perform a defrost operation to remove frost when frost formation is detected.

**[0003]** When a defrost operation is performed, frost adhered on the outdoor heat exchanger melts into drain water and, by extension, into water vapor. The drain water generated by the defrost operation drops on the upper surface of a bottom panel which forms the bottom of a housing of the outdoor unit, and is then discharged to the outside of the outdoor unit through a drain discharging hole which is formed on the bottom panel. Further, water vapor generated by the defrost operation is discharged to the outside of the outdoor unit by natural convection or by rotation of a fan during a heating operation after the end of the defrost operation.

**[0004]** Particularly in a cold climate where the outside air temperature stays considerably low, frost is likely to be formed, and the drain water dropped on the upper surface of the bottom panel from the outdoor heat exchanger may refreeze on the upper surface of the bottom panel before being discharged to the outside of the outdoor unit through the drain discharging hole. Accordingly, in order to prevent the drain water from refreezing on the upper surface of the bottom panel, an outdoor unit having a heater (sheath heater) disposed on the upper surface of the bottom panel has conventionally been available (see, for example, Patent Literature 1).

## [Citation List]

## [Patent Literature]

**[0005]** [Patent Literature 1] Japanese Unexamined Patent Application Publication No. 2011-52941 (p. 10, Figs. 1 & 2)

**[0006]** WO 2013/051166 A1 discloses a refrigeration cycle apparatus which includes a compressor, a condenser, expansion means, and an evaporator that are connected by refrigerant pipes to form a refrigeration cycle. The evaporator is a heat exchanger including a plurality of plate-like heat transfer fins arranged in parallel. The refrigeration cycle apparatus further includes a drain pan disposed below the evaporator, an evaporator fan for producing an air current flowing to the evaporator,

and a heating unit disposed at a position below the heat transfer fins and on a leeward side of the heat transfer fins.

## 5 [Summary of Invention]

## [Technical Problem]

**[0007]** Upon wide use of heat pump air-conditioning devices, the outdoor unit is sometimes installed in an extremely cold climate (where the outside air temperature is 0 degrees C or below) in addition to a cold climate, as in the conventional case. In the extremely cold climate, the surface temperatures of the outdoor heat exchanger and the housing are 0 degrees C or below, as well as the outside air temperature. Accordingly, water vapor generated during a defrost operation may collect and refreeze in the housing, which remains frosted. Further, ice which is generated from frozen water vapor does not melt during a defrost operation. Upon repeated defrost operations, the ice may grow into icicles by repeating refreezing. In the heater described in Patent Literature 1, there is a problem that the water vapor adhered on a member other than the bottom panel cannot sufficiently be prevented from freezing since the heater is disposed on the upper surface of the bottom panel.

**[0008]** Particularly, the amount of air flowing on the outer periphery of a bell mouth during a fan operation is small and air stagnation occurs. As a result, water vapor generated during the defrost operation tends to accumulate and ice tends to grow on the bell mouth. In such a case, there is a problem that ice generated from the frozen water vapor adhered on the bell mouth may come into contact with a propeller fan disposed inside the outdoor unit, and break the propeller fan, or may apply a load to a fan motor which drives the propeller fan, and break the propeller fan.

**[0009]** The present invention is made in light of the above problems, and has as its object to provide an outdoor unit for an air-conditioning device that prevents water vapor adhered on the bell mouth from freezing.

## [Solution to Problem]

**[0010]** An outdoor unit for an air-conditioning device according to the present invention includes a housing having a front panel in which an opening is formed, a fan disposed in an air-sending device chamber which is formed inside the housing, an outdoor heat exchanger disposed in the air-sending device chamber, a bell mouth which is disposed in the air-sending device chamber and extends backwards from a periphery of the opening, and a heater which is disposed in the air-sending device chamber and extends in the up and down direction, wherein the outdoor heat exchanger has an L-shape and is provided to extend along a side face and a back face of the housing which forms the air-sending device chamber, and the heater is disposed between part of the bell

mouth that opposes the side face of the housing forming the air-sending device chamber and the part of the outdoor heat exchanger which is provided to extend along the side face of the housing forming the air-sending device chamber.

[Advantageous Effects of Invention]

**[0011]** According to the present invention, a heater which extends in the up and down direction is provided in an air-sending device chamber in which a bell mouth is provided. Accordingly, even if water vapor adheres to the bell mouth during a defrost operation, the temperature of the water vapor adhered on the bell mouth becomes 0 degrees C or higher due to heat generated by the heater. As a result, it is possible to prevent the water vapor adhered on the bell mouth from freezing in an extremely cold environment where the outside air temperature is 0 degrees C or below.

[Brief Description of Drawings]

**[0012]**

[Fig. 1] Fig. 1 is a perspective view of an outdoor unit 100 of an air-conditioning device according to Embodiment.

[Fig. 2] Fig. 2 is an exploded perspective view of an outdoor unit 100 of an air-conditioning device according to Embodiment.

[Fig. 3] Fig. 3 is an exploded perspective view of the outdoor unit 100 of the air-conditioning device according to Embodiment, and shows details of Fig. 2.

[Fig. 4] Fig. 4 is a cross-sectional view taken along the line X-X of Fig. 1.

[Fig. 5] Fig. 5 is a cross-sectional view taken along the line Y-Y of Fig. 1.

[Fig. 6] Fig. 6 is a view showing how a heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment.

[Fig. 7] Fig. 7 is a cross-sectional view taken along the line X-X of Fig. 1, and shows how the heater 30 is disposed in the outdoor unit 100.

[Fig. 8] Fig. 8 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment.

[Fig. 9] Fig. 9 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment.

[Fig. 10] Fig. 10 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment.

[Description of Embodiment]

**[0013]** An embodiment of the present invention will be described below with reference to the accompanying drawings. In the drawings including Fig. 1, the relation-

ships of size between components may be different from the actual relationships. Also, in the drawings including Fig. 1, the same reference numerals denote the same or equivalent components, and this applies to the entire specification. Further, the modes of the components described in the entire specification are merely illustrative examples, and the invention is not limited thereto.

**[0014]** Fig. 1 is a perspective view of an outdoor unit 100 of an air-conditioning device according to Embodiment. Fig. 2 is an exploded perspective view of the outdoor unit 100 of the air-conditioning device according to Embodiment. Fig. 3 is an exploded perspective view of the outdoor unit 100 of the air-conditioning device according to Embodiment, and shows details of Fig. 2.

**[0015]** As shown in Fig. 1, an outer cover of the outdoor unit 100 is implemented in a housing 50. As shown in Fig. 2, the housing 50 includes a front and side panel 50a, a right side panel 50b, a bottom panel 50c, a top panel 50d and a back panel 50e (see Fig. 4). The front and side panel 50a is implemented using, for example, a member having an L shape, as seen in a plan view, and forms the front face and the left side face of the housing 50. Again, as shown in Fig. 2, a partition 1 is provided in the housing 50. Using the partition 1, the inner space of the housing 50 is divided into a machine chamber 10 and an air-sending device chamber 20.

**[0016]** The front and side panel 50a may be implemented using separate members, which individually form the front face and the left side face of the housing 50. That is, the front and side panel 50a may be divided into a front panel which forms the front face of the housing 50, and a left side panel which forms the left side face of the housing 50.

**[0017]** A compressor 11 and an electrical component box 12 are provided in the machine chamber 10. A control board (not shown) is provided in the electrical component box 12. The control board (not shown) serves as a member for controlling the rotation speed of the compressor 11 and driving, for example, a heater 30 (to be described later). Further, the control board (not shown) is implemented using hardware such as a circuit device that implements its function, or software running on an arithmetic unit such as a microcomputer or CPU.

**[0018]** The air-sending device chamber 20 is provided with an outdoor heat exchanger 21, a fan 22, a fan motor 23 (see Fig. 4), a fan motor supporting plate 24, an upper plate 25 and a supporting plate connection portion 26. The outdoor heat exchanger 21 is positioned more to the back of the outdoor unit 100 than the fan 22, the fan motor 23, the fan motor supporting plate 24, the upper plate 25 and the supporting plate connection portion 26.

**[0019]** The outdoor heat exchanger 21 has an L shape, as seen in a plan view, and is disposed to extend along the surface of the left side face of the front and side panel 50a and the back panel 50e. The fan 22 serves as an air-sending means implemented in, for example, a propeller fan, and generates an air circulating flow for effectively exchanging heat. The fan 22 serves to introduce

the outside air from the back side of the outdoor unit 100 into the outdoor unit 100, and exhausting it to the front face of the outdoor unit 100.

**[0020]** The fan motor 23 serves as a driving means for driving the fan 22, and is mounted on the fan motor supporting plate 24 by using a fixing means such as a screw. The fan motor supporting plate 24 serves to support the fan motor 23, and is a frame-shaped member which extends upwards from the bottom panel 50c. Note that a plurality of fan motor supporting plates 24 may be provided, instead of a single fan motor supporting plate 24 as shown in the drawings.

**[0021]** The upper plate 25 is implemented using a plate member which is, for example, almost parallel to the bottom panel 50c. The upper plate 25 serves as a member for reinforcing the strength of the fan motor supporting plate 24 to cope with the situation in which the fan motor 23 is comparatively large. The upper plate 25 is connected to the fan motor supporting plate 24. The upper plate 25 is mounted, for example, on the top end of the fan motor supporting plate 24 and extends to the front.

**[0022]** The supporting plate connection portion 26 is, for example, a U-shaped member, and is integrated with the fan motor supporting plate 24. The inner surface of the supporting plate connection portion 26 is in contact with the upper surface of the outdoor heat exchanger 21. Thus, the fan motor supporting plate 24 is fixed to the outdoor heat exchanger 21 by mounting the supporting plate connection portion 26 on the outdoor heat exchanger 21.

**[0023]** As shown in Fig. 3, an opening 50a1 is formed in the front and side panel 50a. The opening 50a1 serves to exhaust, to the outside of the outdoor unit 100, the outside air introduced into the outdoor unit 100. Further, a bell mouth 27 is provided on the back side of the front and side panel 50a so as to surround the outer periphery of the fan 22.

**[0024]** The bell mouth 27 includes, for example, a convergent portion 27a which extends backwards so that its diameter is smaller in areas more radially inward and farther from the periphery of the opening 50a1, and a divergent portion 27b which extends backwards so that its diameter is larger in areas more radially outward and farther from the back end of the convergent portion 27a. The bell mouth 27 is integrated with the front and side panel 50a. The bell mouth 27 serves to guide the outside air introduced in the housing 50 to the opening 50a1. Note that the bell mouth 27 may be formed to have a portion extending in the front and back direction between the convergent portion 27a and the divergent portion 27b.

**[0025]** Fig. 4 is a cross-sectional view taken along the line X-X of Fig. 1. Fig. 5 is a cross-sectional view taken along the line Y-Y of Fig. 1. Referring to Figs. 4 and 5, a flow of air is schematically shown as an air flow A using arrows. An air flow passage formed inside and outside the housing 50 will be described below with reference to Figs. 4 and 5.

**[0026]** When a fan 22 rotates by driving the fan motor

23, the outside air is introduced into the housing 50. The outside air introduced in the housing 50 is blown to a member such as the bell mouth 27 through the outdoor heat exchanger 21. After circulating inside the housing 50, the outside air is exhausted to the outside of the housing 50 through the opening 50a1. As shown in Figs. 4 and 5, air stagnation A1 tends to occur on the outer periphery of the bell mouth 27.

**[0027]** Fig. 6 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment. Fig. 7 is a cross-sectional view taken along the line X-X of Fig. 1, and shows how the heater 30 is disposed in the outdoor unit 100. As shown in Fig. 6, the heater 30 which extends in the up and down direction is mounted in the outdoor heat exchanger 21 via a heater supporting member 28.

**[0028]** The heater 30 serves as a heating means implemented in, for example, a sheath heater, and heats the water vapor generated inside the housing 50. A nichrome wire is provided inside the heater 30. Note that the heater 30 may be implemented in a flexible heater. This configuration facilitates positioning of the heater 30 in the housing 50. As shown in Fig. 7, the heater 30 has a circular cross-section.

**[0029]** The heater 30 is disposed between a portion of the outdoor heat exchanger 21 which extends in the front and back direction along the left side face of the front and side panel 50a and the back end of the convergent portion 27a of the bell mouth 27 which opposes the left side face of the front and side panel 50a. The heater 30 is bent in the vicinity of the heater supporting member 28 to form an inverted U shape, as seen in a side view, and is located around the outdoor heat exchanger 21.

**[0030]** The heater 30 is used with a power consumption of, for example, 100 W at a temperature of, for example, 30 degrees C. The heater 30 is activated when an outside air temperature sensor (not shown) detects a predetermined temperature or below during a heating operation. Note that the power consumption and temperature of the heater 30 are not limited to the above-mentioned values, and are determined as appropriate so that the water vapor generated in the housing 50 is heated.

**[0031]** The heater 30 further extends in the right and left direction on the upper surface of the bottom panel 50c. The heater 30 is desirably disposed on the front part of the bottom panel 50c. Specifically, the heater 30 is preferably disposed, for example, on the upper surface of the bottom panel 50c more to the front than the back end of the bell mouth 27 as seen in a plan view. With this configuration, it is possible to reliably prevent the water vapor adhered on the bell mouth 27 from freezing, and, in turn, to prevent the water flowing out of the outdoor heat exchanger 21 from freezing.

**[0032]** Note that a configuration is also possible in which the heater 30 extends in the up and down direction in the vicinity of the left side face of the front and side panel 50a and does not extend on the front part of the upper surface of the bottom panel 50c. In this configura-

tion as well, it is possible to prevent the water vapor adhered on the bell mouth 27 from freezing.

**[0033]** Also, a configuration is also possible in which the heater 30 extends in the up and down direction while curving to the right and left instead of the use of a heater 30 extending straight in the up and down direction as shown in Fig. 6. With this configuration, since the surface area of the heater 30, at which it emits heat to the bell mouth 27, increases, it is possible to reliably prevent the water vapor adhered on the bell mouth 27 from freezing.

**[0034]** The operation of the outdoor unit 100 in an extremely cold climate where the outside air temperature is 0 degrees C or below will be described next. The above-described control board (not shown) controls the operation of the outdoor unit 100 in response to, for example, an operation of an operation means (not shown) through which a user sets an operation mode. Although the operation mode can be, for example, a heating operation or a cooling operation, the following description assumes a heating operation as the set operation mode.

**[0035]** When a heating operation is set, the fan 22 rotates and the outside air is introduced into the housing 50, as described above. Since the outdoor heat exchanger 21 functions as an evaporator, the outside air introduced in the housing 50 exchanges heat with the refrigerant in the outdoor heat exchanger 21 and has its temperature lowered. The outside air whose temperature is lowered is blown to a member such as the bell mouth 27 in the air-sending device chamber 20. When the temperature of the outside air detected by the outside air temperature sensor reaches a predetermined temperature or below, the control board activates the heater 30. Accordingly, when the heater 30 is activated, heat generated by the heater 30 is transmitted to the bell mouth 27, thereby suppressing frost formation on the bell mouth 27.

**[0036]** At a predetermined time after the start of a heating operation, the control board stops the operation of the compressor 11 and switches a four-way valve (not shown) to enable a cooling operation. Then, the control board resumes the operation of the compressor 11 and stops the rotation of the fan 22. Upon this operation, a defrost operation starts.

**[0037]** In the defrost operation, since the outdoor heat exchanger 21 functions as a condenser, the refrigerant discharged from the compressor 11 flows into the outdoor heat exchanger 21 so as to generate heat in the outdoor heat exchanger 21. Accordingly, by the defrost operation the temperature inside the housing 50 can be increased using the heat in the outdoor heat exchanger 21.

**[0038]** Upon the defrost operation, the temperature of the frost adhered on the bell mouth 27 increases and the frost turns into water vapor. The water vapor naturally refreezes if it remains untreated in an extremely cold climate where the outside air temperature is 0 degrees C or below. However, the heater 30 provided on the bell mouth 27 heats the water vapor adhered on the bell mouth 27. This makes it possible to prevent the water vapor adhered on the bell mouth 27 from refreezing.

**[0039]** Note that the heater 30 may be implemented using a hot gas bypass (not shown) which directly supplies to the outdoor heat exchanger 21 at least a part of the refrigerant discharged from the compressor 11. In

5 this case, a refrigerant stream having a temperature and pressure higher than those of a refrigerant stream discharged from the compressor 11 and supplied to the outdoor heat exchanger 21 through an indoor heat exchanger (not shown) flows in the hot gas bypass. Accordingly, 10 the bell mouth 27 can be heated by using heat generated by the refrigerant which flows in the hot gas bypass.

**[0040]** As described above, the outdoor unit 100 according to this Embodiment includes the housing 50 having the front and side panel 50a in which the opening 50a1 is formed, the fan 22 disposed in the air-sending device chamber 20 which is formed inside the housing 50, the outdoor heat exchanger 21 disposed in the air-sending device chamber 20, the bell mouth 27 which is disposed in the air-sending device chamber 20 and extends backwards from the periphery of the opening 50a1, and the heater 30 which is disposed in the air-sending device chamber 20 and extends in the up and down direction.

**[0041]** With this arrangement, even if water vapor adheres to the bell mouth 27 during a defrost operation, the temperature of the water vapor adhered on the bell mouth 27 becomes 0 degrees C or higher due to heat generated by the heater. As a result, it is possible to prevent the water vapor adhered on the bell mouth 27 from freezing in an extremely cold environment where the outside air temperature is 0 degrees C or below. Particularly, even if air stagnation occurs on the outer periphery of the bell mouth 27, the water vapor adhered on the outer peripheral surface of the bell mouth 27 can be prevented from freezing.

**[0042]** Further, the heater 30 is disposed more to the side of the outdoor heat exchanger 21 which is provided to extend along the side face of the air-sending device chamber 20 than the bell mouth 27. Accordingly, it is possible to transmit heat generated by the heater 30 to a portion of the bell mouth 27 where heat generated by the compressor 11 is less likely to be transmitted and water vapor is most likely to freeze.

**[0043]** Fig. 8 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment. Fig. 9 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment. Fig. 10 is a view showing how the heater 30 is disposed in the outdoor unit 100 of the air-conditioning device according to Embodiment.

**[0044]** As shown in Fig. 8, a configuration is also possible in which the heater has a plurality of portions bent to form a plurality of inverted and non-inverted U shapes. 55 With this configuration, since the surface area of the heater 30, at which it emits heat to the bell mouth 27, is relatively large, it is possible to reliably prevent the water vapor adhered on the bell mouth 27 from freezing.

**[0045]** Further, as shown in Fig. 9, a configuration is also possible in which the heater 30 extends in the right and left direction in a portion above the top end of the bell mouth 27. With this configuration, it is possible to prevent the water vapor adhered on the upper area of the bell mouth 27 as well as the water vapor adhered on the lower and side areas of the bell mouth 27 from freezing.

**[0046]** Further, as shown in Fig. 10, a configuration is also possible in which the heater is bent around the center of the bell mouth 27 in the up and down direction. In the heater 30 having this configuration, it is possible to heat the central portion of the bell mouth 27 where air stagnation is most likely to occur. Accordingly, even if a sufficient space for installing the heater 30 is not provided, the water vapor adhered on the bell mouth 27 can be efficiently prevented from freezing.

[Reference Signs List]

**[0047]** 1 partition 10 machine chamber 11 compressor 12 electrical component box 20 air-sending device chamber 21 outdoor heat exchanger 22 fan 23 fan motor 24 fan motor supporting plate 25 upper plate 26 upper plate connection portion 27 bell mouth 27a convergent portion 27b divergent portion 28 heater supporting member 30 heater 50 housing 50a front and side panel 50a1 opening 50b right side panel 50c bottom panel 50d top panel 50e back panel 100 outdoor unit A air flow A1 air stagnation

**Claims**

1. An outdoor unit for an air-conditioning device comprising:

a housing (50) which includes a front panel in which an opening (50a1) is formed;  
a fan (22) disposed in an air-sending device chamber (20) which is formed inside the housing (50);  
an outdoor heat exchanger (21) disposed in the air-sending device chamber (20);  
**characterized in** furthermore comprising:

a bell mouth (27) which is disposed in the air-sending device chamber (20) and extends backwards from a periphery of the opening (50a1); and  
a heater (30) which is disposed in the air-sending device chamber (20) in which the bell mouth (27) is disposed, and extends in an up and down direction.  
wherein the outdoor heat exchanger (21) has an L-shape and is provided to extend along a side face and a back face of the housing (50) which forms the air-sending device chamber (20), and the heater (30) is

disposed more to a side of the outdoor heat exchanger (21) which is provided to extend along the side face of the air-sending device chamber (20) than the bell mouth (27).

5

10

15

20

25

30

35

40

45

50

55

60

65

70

75

80

85

90

95

100

105

110

115

120

125

130

135

140

145

150

155

160

165

170

175

180

185

190

195

200

205

210

215

220

225

230

235

240

245

250

255

260

265

270

275

280

285

290

295

300

305

310

315

320

325

330

335

340

345

350

355

360

365

370

375

380

385

390

395

400

405

410

415

420

425

430

435

440

445

450

455

460

465

470

475

480

485

490

495

500

505

510

515

520

525

530

535

540

545

550

555

560

565

570

575

580

585

590

595

600

605

610

615

620

625

630

635

640

645

650

655

660

665

670

675

680

685

690

695

700

705

710

715

720

725

730

735

740

745

750

755

760

765

770

775

780

785

790

795

800

805

810

815

820

825

830

835

840

845

850

855

860

865

870

875

880

885

890

895

900

905

910

915

920

925

930

935

940

945

950

955

960

965

970

975

980

985

990

995

1000

1005

1010

1015

1020

1025

1030

1035

1040

1045

1050

1055

1060

1065

1070

1075

1080

1085

1090

1095

1100

1105

1110

1115

1120

1125

1130

1135

1140

1145

1150

1155

1160

1165

1170

1175

1180

1185

1190

1195

1200

1205

1210

1215

1220

1225

1230

1235

1240

1245

1250

1255

1260

1265

1270

1275

1280

1285

1290

1295

1300

1305

1310

1315

1320

1325

1330

1335

1340

1345

1350

1355

1360

1365

1370

1375

1380

1385

1390

1395

1400

1405

1410

1415

1420

1425

1430

1435

1440

1445

1450

1455

1460

1465

1470

1475

1480

1485

1490

1495

1500

1505

1510

1515

1520

1525

1530

1535

1540

1545

1550

1555

1560

1565

1570

1575

1580

1585

1590

1595

1600

1605

1610

1615

1620

1625

1630

1635

1640

1645

1650

1655

1660

1665

1670

1675

1680

1685

1690

1695

1700

1705

1710

1715

1720

1725

1730

1735

1740

1745

1750

1755

1760

1765

1770

1775

1780

1785

1790

1795

1800

1805

1810

1815

1820

1825

1830

1835

1840

1845

1850

1855

1860

1865

1870

1875

1880

1885

1890

1895

1900

1905

1910

1915

1920

1925

1930

1935

1940

1945

1950

1955

1960

1965

1970

1975

1980

1985

1990

1995

2000

2005

2010

2015

2020

2025

2030

2035

2040

2045

2050

2055

2060

2065

2070

2075

2080

2085

2090

2095

2100

2105

2110

2115

2120

2125

2130

2135

2140

2145

2150

2155

2160

2165

2170

2175

2180

2185

2190

2195

2200

2205

2210

2215

2220

2225

2230

2235

2240

2245

2250

2255

2260

2265

2270

2275

2280

2285

2290

2295

2300

2305

2310

2315

2320

2325

2330

2335

2340

2345

2350

2355

2360

2365

2370

2375

2380

2385

2390

2395

2400

2405

2410

2415

2420

2425

2430

2435

2440

2445

2450

2455

2460

2465

2470

2475

2480

2485

2490

2495

2500

2505

2510

2515

2520

2525

2530

2535

2540

2545

2550

2555

2560

2565

2570

2575

2580

2585

2590

2595

2600

2605

2610

2615

2620

2625

2630

2635

2640

2645

2650

2655

2660

2665

2670

2675

2680

2685

2690

2695

2700

2705

2710

2715

2720

2725

2730

2735

2740

2745

2750

2755

2760

2765

2770

2775

2780

2785

2790

2795

2800

2805

2810

2815

2820

2825

2830

2835

2840

2845

2850

2855

2860

2865

2870

2875

2880

2885

2890

2895

2900

2905

2910

2915

2920

2925

2930

2935

2940

2945

2950

2955

2960

2965

2970

2975

2980

2985

2990

2995

3000

3005

3010

3015

3020

3025

3030

3035

3040

3045

3050

3055

3060

3065

3070

3075

3080

3085

3090

3095

3100

3105

3110

3115

3120

3125

3130

3135

3140

3145

3150

3155

3160

3165

3170

3175

3180

3185

3190

3195

3200

3205

3210

3215

3220

3225

3230

3235

3240

3245

3250

3255

3260

3265

3270

3275

3280

3285

3290

3295

3300

3305

3310

3315

3320

3325

3330

3335

3340

3345

3350

3355

3360

3365

3370

3375

3380

3385

3390

3395

3400

3405

3410

3415

3420

3425

3430

3435

3440

3445

3450

3455

3460

3465

3470

3475

3480

3485

3490

3495

3500

3505

3510

3515

3520

3525

3530

3535

3540

3545

3550

3555

3560

3565

3570

3575

3580

3585

3590

3595

3600

3605

3610

3615

3620

3625

3630

3635

3640

3645

3650

3655

3660

3665

3670

3675

3680

3685

3690

3695

3700

3705

3710

3715

3720

3725

3730

3735

3740

3745

3750

3755

3760

3765

3770

3775

3780

3785

3790

3795

3800

3805

3810

3815

3820

3825

3830

3835

3840

3845

3850

3855

3860

3865

3870

3875

3880

3885

3890

3895

3900

3905

3910

3915

3920

3925

3930

3935

3940

3945

3950

3955

3960

3965

3970

3975

3980

3985

3990

3995

4000

4005

4010

4015

4020

4025

4030

4035

4040

4045

4050

4055

4060

4065

4070

4075

4080

4085

4090

4095

4100

4105

4110

4115

4120

4125

4130

4135

4140

4145

4150

4155

4160

4165

4170

4175

4180

4185

4190

4195

4200

4205

4210

4215

4220

4225

4230

4235

4240

4245

4250

4255

4260

4265

4270

4275

4280

4285

4290

4295

4300

4305

4310

4315

4320

4325

4330

4335

4340

4345

4350

4355

4360

4365

4370

4375

4380

4385

4390

4395

4400

4405

4410

4415

4420

4425

4430

4435

4440

4445

4450

4455

4460

4465

4470

4475

4480

4485

4490

4495

4500

4505

4510

4515

4520

4525

4530

4535

4540

4545

4550

4555

4560

4565

4570

4575

4580

4585

4590

4595

4600

4605

4610

4615

4620

4625

4630

4635

4640

4645

4650

4655

4660

4665

4670

4675

4680

4685

4690

4695

4700

4705

4710

4715

4720

4725

4730

4735

4740

4745

4750

4755

4760

4765

4770

4775

4780

4785

4790

4795

4800

4805

4810

4815

4820

4825

4830

4835

4840

4845

4850

4855

4860

4865

4870

4875

4880

4885

4890

4895

4900

4905

4910

4915

4920

4925

4930

4935

4940

4945

4950

4955

4960

4965

4970

4975

4980

4985

4990

4995

5000

5005

5010

5015

5020

5025

5030

5035

5040

5045

5050

5055

5060

5065

5070

5075

5080

5085

5090

5095

5100

5105

5110

5115

5120

5125

5130

5135

5140

5145

5150

5155

5160

5165

5170

5175

5180

5185

5190

5195

5200

5205

5210

5215

5220

5225

5230

5235

5240

5245

5250

5255

5260

5265

5270

5275

5280

5285

5290

5295

5300

5305

5310

5315

5320

5325

5330

5335

5340

5345

5350

5355

5360

5365

5370

5375

5380

5385

5390

5395

5400

5405

5410

5415

5420

5425

5430

5435

5440

5445

5450

5455

5460

5465

5470

5475

5480

5485

5490

5495

5500

5505

5510

5515

5520

5525

5530

5535

5540

5545

5550

5555

5560

5565

5570

5575

5580

5585

5590

5595

5600

5605

5610

5615

5620

5625

5630

5635

5640

5645

5650

5655

5660

5665

5670

5675

5680

5685

5690

5695

5700

5705

5710

5715

5720

deeinrichtungskammer (20) angeordnet ist und sich von einer Peripherie der Öffnung (50a1) nach hinten erstreckt; und einen Erwärmer (30), der in der Luftseneeinrichtungskammer (20), in der die Trichterdüse (27) angeordnet ist, angeordnet ist und sich in einer Aufwärts- und Abwärtsrichtung erstreckt, wobei der Außenwärmetauscher (21) eine L-Form aufweist und vorgesehen ist, sich entlang einer seitlichen Fläche und einer hinteren Fläche des Gehäuses (50), das die Luftseneeinrichtungskammer (20) bildet, zu erstrecken, und der Erwärmer (30) näher als die Trichterdüse (27) zu einer Seite des Außenwärmetauschers (21) angeordnet ist, die vorgesehen ist, sich entlang der seitlichen Fläche der Luftseneeinrichtungskammer (20) zu erstrecken.

2. Außeneinheit für eine Klimaanlage nach Anspruch 1, ferner umfassend:

einen Verdichter (11); und einen Trennwand (1), die einen Innenraum des Gehäuses (50) in eine Vielzahl von Räume unterteilt, wobei die Trennwand (1) den Innenraum des Gehäuses (50) in eine Maschinenkammer (10), in der der Verdichter (11) untergebracht ist, und die Luftseneeinrichtungskammer (20) unterteilt.

3. Außeneinheit für eine Klimaanlage nach Anspruch 1 oder 2, wobei der Erwärmer (30) vorgesehen ist, um eine invertierte U-Form, betrachtet in einer Seitenansicht, zu bilden.

4. Außeneinheit für eine Klimaanlage nach einem der Ansprüche 1 bis 3, wobei der Erwärmer (30) ferner auf einer oberen Oberfläche einer das Gehäuse (50) bildenden Bodenblende (50c) vorgesehen ist.

5. Außeneinheit für eine Klimaanlage nach einem der Ansprüche 1 bis 4, wobei der Erwärmer (30) vorgesehen ist, um sich in einer rechten und linken Richtung in einem Abschnitt über einem oberen Ende der Trichterdüse (27) zu erstrecken.

6. Außeneinheit für eine Klimaanlage nach einem der Ansprüche 1 bis 5, wobei der Erwärmer (30) eine Vielzahl von gekrümmten Abschnitten aufweist.

7. Außeneinheit für eine Klimaanlage nach einem der Ansprüche 1 bis 6, wobei der Erwärmer (30) realisiert ist unter Verwendung einer Heißgas-Umgehungsleitung, die dem Außenwärmetauscher (21) zumindes einen Teil des aus einem im Gehäuse (50) angeordneten Verdichters (11) abgegebenen Kältemittels zuführt.

5 **Revendications**

1. Unité extérieure pour un dispositif de climatisation comprenant :

un boîtier (50) qui comprend un panneau avant dans lequel une ouverture (50a1) est formée ; un ventilateur (22) disposé dans une chambre de dispositif d'émission d'air (20) qui est formée à l'intérieur du boîtier (50) ; un échangeur de chaleur extérieur (21) disposé dans la chambre de dispositif d'émission d'air (20) ; **caractérisée en ce qu'elle comprend en outre :**

une tulipe d'aspiration (27) qui est disposée dans la chambre de dispositif d'émission d'air (20) et s'étend vers l'arrière à partir d'une périphérie de l'ouverture (50a1) ; et un dispositif de chauffage (30) qui est disposé dans la chambre de dispositif d'émission d'air (20) dans laquelle la tulipe d'aspiration (27) est disposée, et s'étend dans une direction ascendante et descendante, dans laquelle l'échangeur de chaleur extérieur (21) a une forme de L et est prévu pour s'étendre le long d'une face latérale et d'une face arrière du boîtier (50) qui forme la chambre de dispositif d'émission d'air (20), et le dispositif de chauffage (30) est disposé davantage vers un côté de l'échangeur de chaleur extérieur (21) qui est prévu pour s'étendre le long de la face latérale de la chambre de dispositif d'émission d'air (20), que la tulipe d'aspiration (27).

2. Unité extérieure pour un dispositif de climatisation selon la revendication 1, comprenant en outre :

un compresseur (11) ; et une séparation (1) qui divise un espace interne du boîtier (50) en une pluralité d'espaces, dans laquelle la séparation (1) divise l'espace interne du boîtier (50) en une chambre de machine (10) qui loge le compresseur (11) et en une chambre de dispositif d'émission d'air (20).

3. Unité extérieure pour un dispositif de climatisation selon la revendication 1 ou 2, dans laquelle : le dispositif de chauffage (30) est prévu pour former une forme de U inversé, comme observé sur une vue latérale.

4. Unité extérieure pour un dispositif de climatisation

selon l'une quelconque des revendications 1 à 3,  
dans laquelle le dispositif de chauffage (30) est en  
outre prévu sur une surface supérieure d'un pan-  
neau inférieur (50c) qui forme le boîtier (50).

5

5. Unité extérieure pour un dispositif de climatisation  
selon l'une quelconque des revendications 1 à 4,  
dans laquelle le dispositif de chauffage (30) est prévu  
pour s'étendre dans une direction droite et gauche  
d'une partie au-dessus d'une extrémité supérieure 10  
de la tulipe d'aspiration (27).
6. Unité extérieure pour un dispositif de climatisation  
selon l'une quelconque des revendications 1 à 5,  
dans laquelle le dispositif de chauffage (30) com- 15  
prend une pluralité de parties pliées.
7. Unité extérieure pour un dispositif de climatisation  
selon l'une quelconque des revendications 1 à 6,  
dans laquelle le dispositif de chauffage (30) est mis 20  
en œuvre en utilisant un tuyau de dérivation de gaz  
chaud qui amène, directement à l'échangeur de cha-  
leur extérieur (21), au moins une partie d'un réfrigé-  
rant déchargé par un compresseur (11) qui est dis-  
posé dans le boîtier (50). 25

30

35

40

45

50

55

FIG. 1

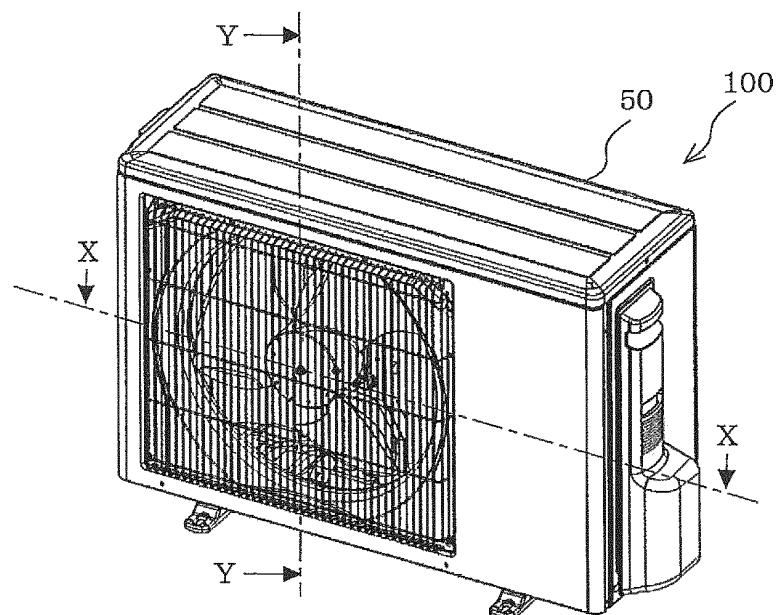


FIG. 2

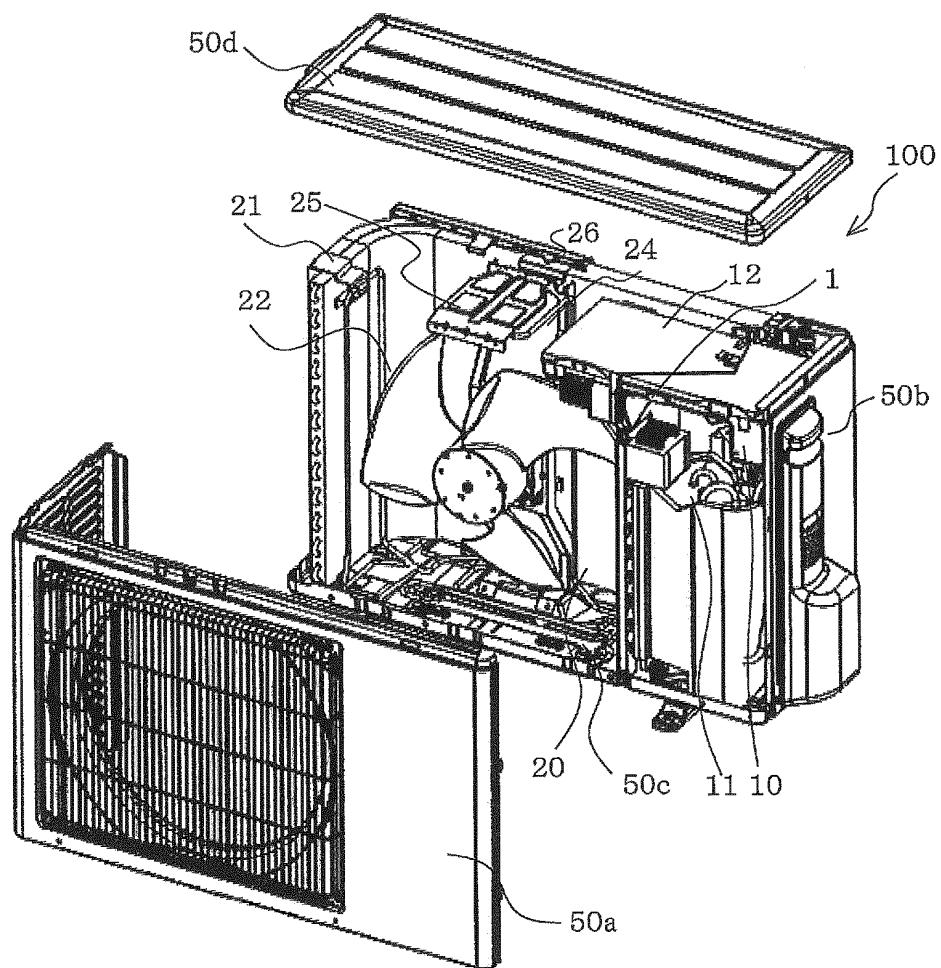


FIG. 3

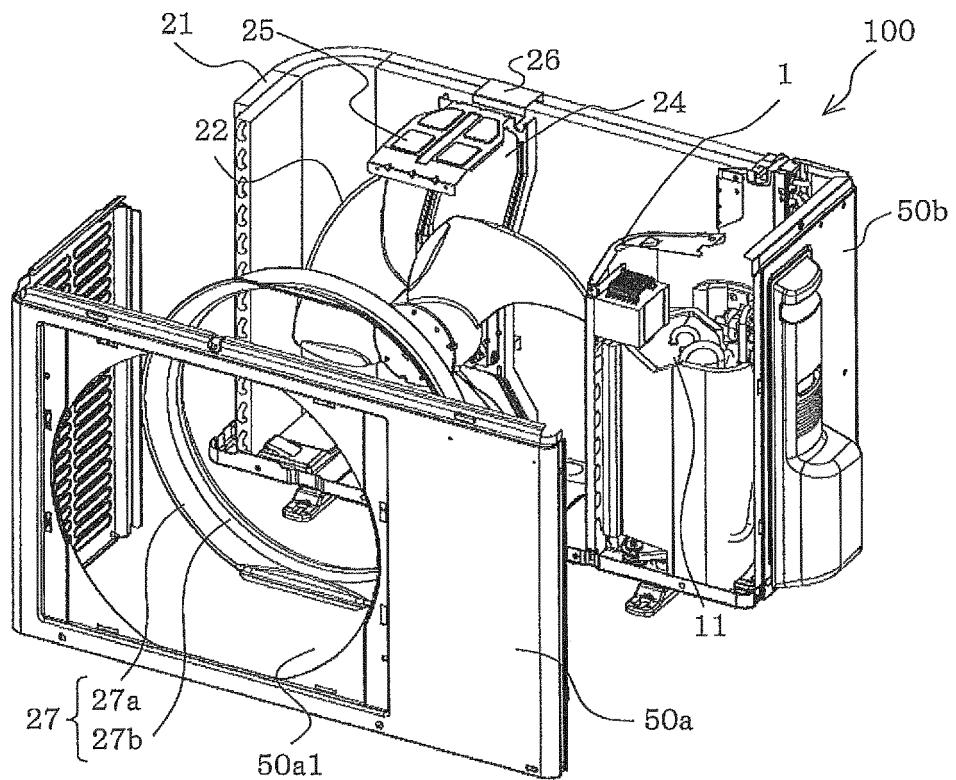
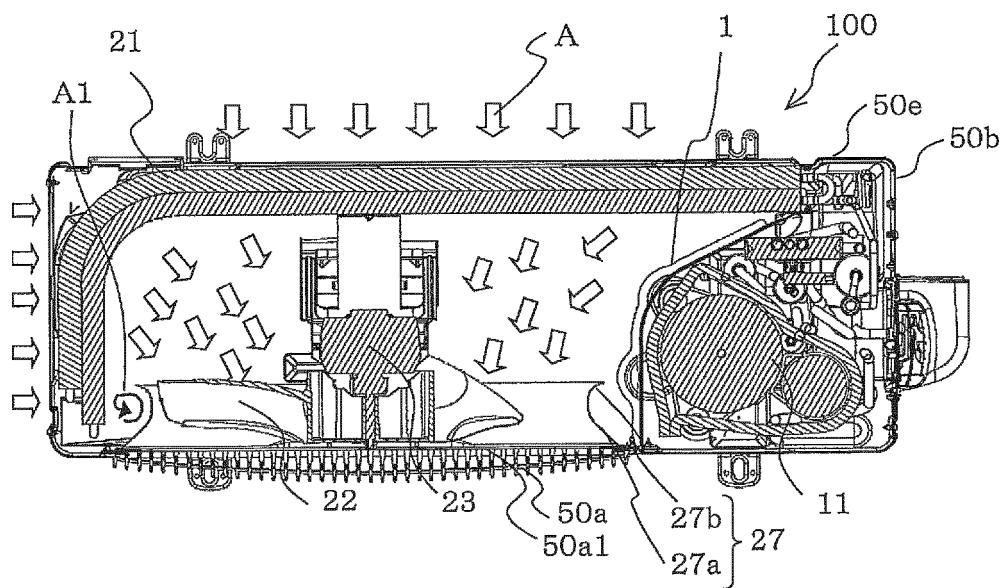
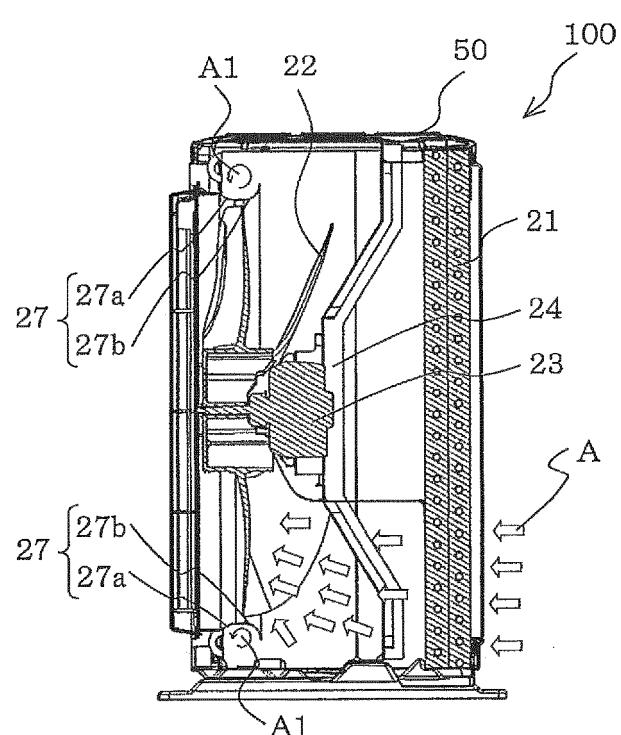


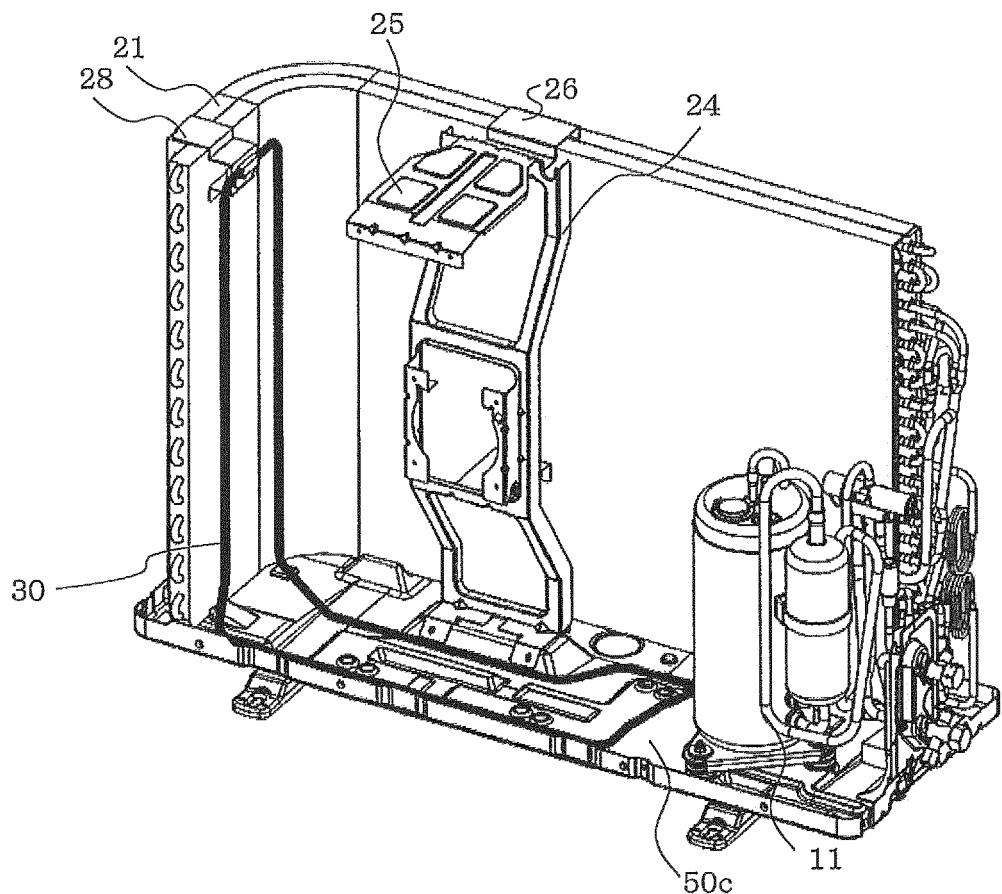
FIG. 4



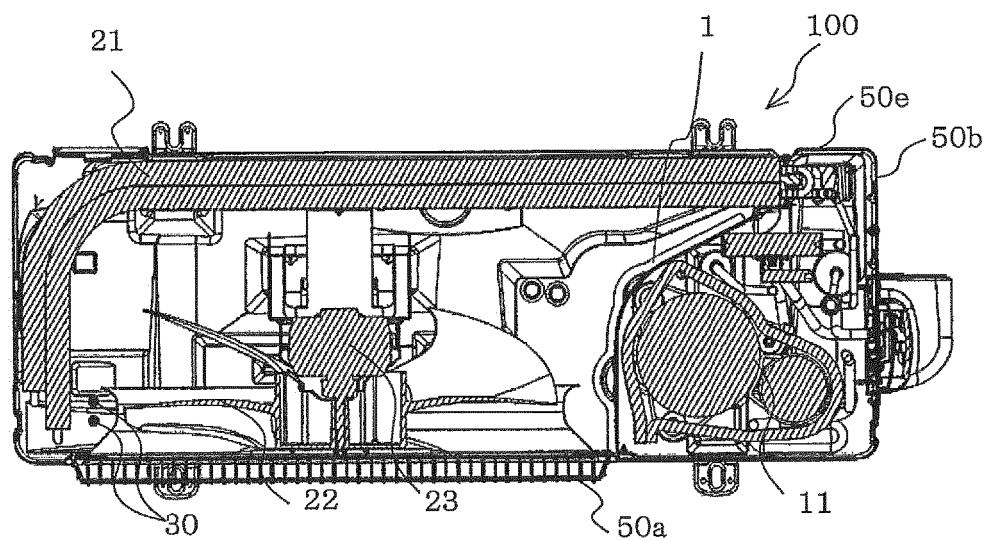
F I G. 5



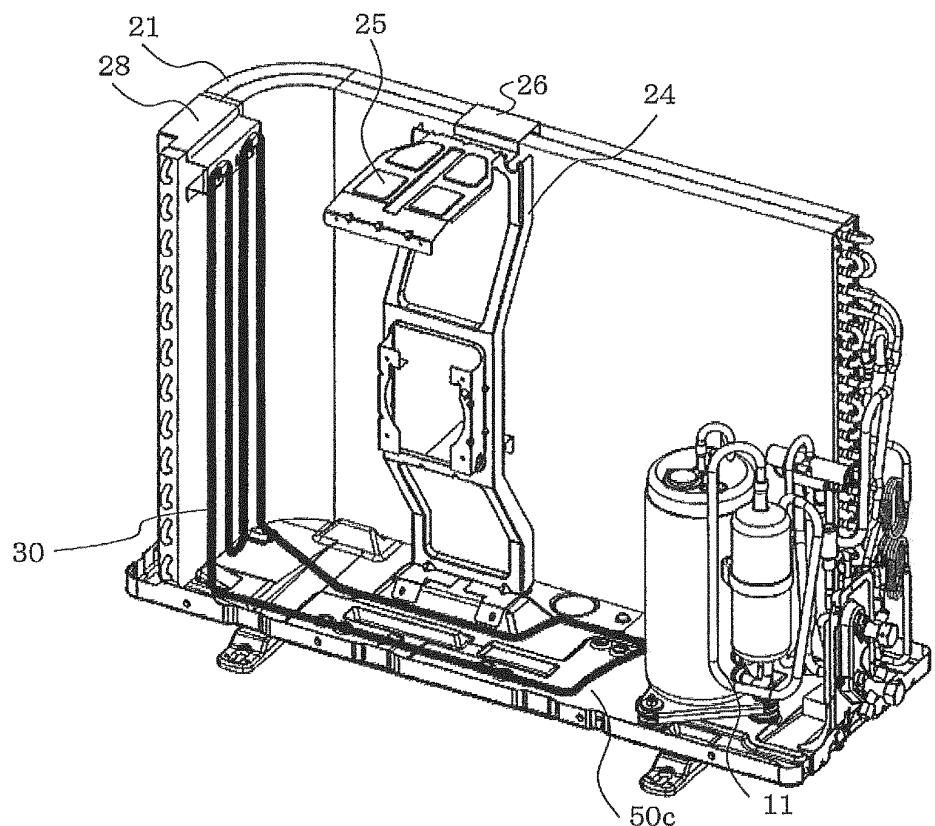
F I G. 6



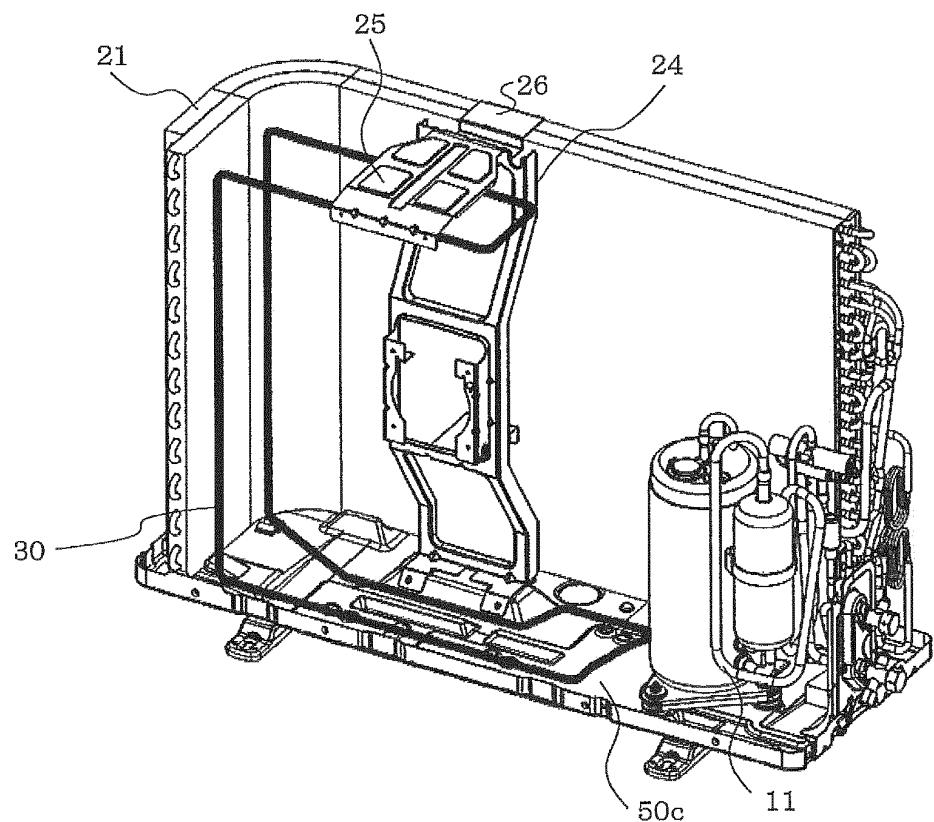
F I G. 7



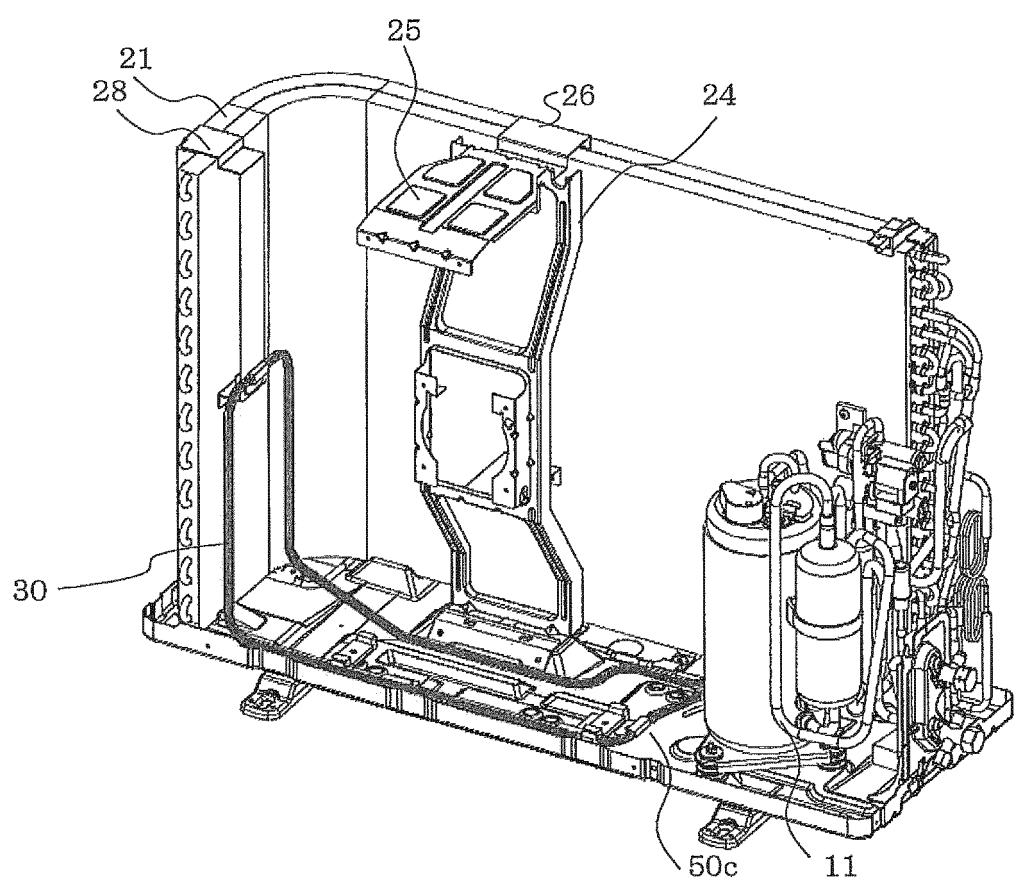
F I G. 8



F I G. 9



F I G. 1 0



**REFERENCES CITED IN THE DESCRIPTION**

*This list of references cited by the applicant is for the reader's convenience only. It does not form part of the European patent document. Even though great care has been taken in compiling the references, errors or omissions cannot be excluded and the EPO disclaims all liability in this regard.*

**Patent documents cited in the description**

- JP 2011052941 A [0005]
- WO 2013051166 A1 [0006]