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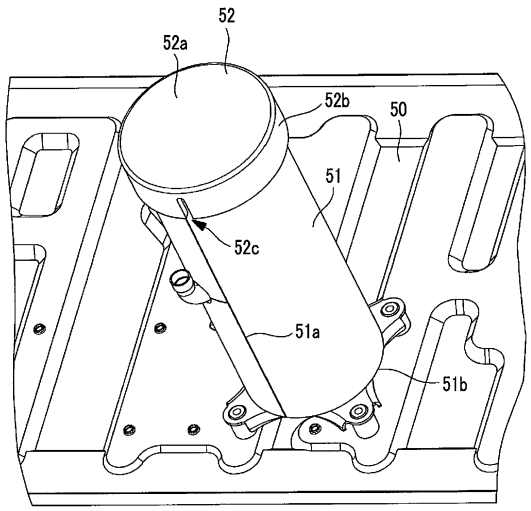
(54) COMPRESSOR UNIT, AND OUTDOOR UNIT WITH SAME

(57) The present invention is provided with: a compressor which is mounted on a bottom plate (50) having protrusions and recesses on the surface thereof and which compresses a refrigerant; and a noise insulation cover (51) which covers the entire perimeter of the side portion of the compressor, has a base shaped to match the protrusions and recesses of the bottom plate (50), and is mounted while the entire perimeter of the noise insulation cover is in contact with the bottom plate (50). The present invention is further provided with a noise insulation cap (52) for covering the upper part of the compressor. The noise insulation cap (52) is mounted and fitted to the entire perimeter of the upper end of the noise insulation cover (51). As a result of this configuration, the gap between the base of the noise insulation cover (51) and the bottom plate (51) having the protrusions and recesses can be reduced, and noise is prevented from leaking from the base of the noise insulation cover (51).

FIG. 3



EP 3 505 834 A1

Description

Technical Field

[0001] The present invention relates to a compressor unit which is suitable for use in an air conditioner and suppresses noise, and an outdoor unit provided with the compressor unit.

Background Art

[0002] In an outdoor unit of an air conditioner, a compressor which compresses a refrigerant is provided on a bottom plate. In the compressor, a compression unit such as a scroll part is driven by an electric motor, and a compressed refrigerant is discharged. In this manner, the compressor becomes a vibration source and also becomes a noise source.

[0003] In order to suppress noise which is generated from the compressor, a noise insulation cover wound around the compressor is known (refer to PTLs 1 and 2).

Citation List

Patent Literature

[0004]

[PTL 1] Japanese Unexamined Utility Model Registration Application Publication No. 6-18825
[PTL 2] Japanese Unexamined Patent Application Publication No. 60-49280

Summary of Invention

Technical Problem

[0005] However, although the noise insulation cover described in each of the above patent documents covers the compressor, leakage of noise from a lower end of the noise insulation cover is not taken into account. For example, in a case where protrusions and recesses are formed on the surface of the bottom plate on which the compressor is installed, a minute gap is generated at the lower end of the noise insulation cover due to the difference in height between the protrusion and the recess, and thus the noise leaks. As a result of extensive studies by the inventors of the present invention, it was found that if the rotational frequency of the compressor is increased so as to be able to reach, for example, a rotational frequency exceeding 130 rps and up to 200 rps, the noise which is leaked from such a minute gap also cannot be ignored.

[0006] The present invention has been made in view of such circumstances and has an object to provide a compressor unit provided with a noise insulation cover capable of suppressing noise which is generated from a compressor, and an outdoor unit provided with the compressor unit. Solution to Problem

[0007] In order to solve the above problem, a compressor unit and an outdoor unit provided with the compressor unit according to the present invention adopt the following means.

[0008] That is, a compressor unit according to an aspect of the present invention includes a compressor which is installed on a bottom plate having protrusions and recesses on a surface thereof and compresses a refrigerant, and a noise insulation cover which covers an entire circumference of a side portion of the compressor and is disposed in a state where an entire circumference thereof is in contact with the bottom plate in a bottom side shape to match the protrusions and recesses.

[0009] The noise insulation cover covers the entire circumference of the side portion of the compressor, thereby suppressing noise which is generated from the compressor. The bottom side of the noise insulation cover is in contact with the bottom plate at the entire circumference thereof and is shaped to match the protrusions and recesses of the surface of the bottom plate. In this way, a gap which is generated between the bottom side of the noise insulation cover and the bottom plate having the protrusions and recesses can be reduced, and therefore, it is possible to suppress the leakage of the noise from the bottom side of the noise insulation cover.

[0010] Further, the compressor unit according to the above aspect of the present invention further includes a noise insulation cap which covers an upper portion of the compressor, and the noise insulation cap is mounted in a state of being fitted to an entire circumference of an upper end of the noise insulation cover.

[0011] The noise insulation cap which covers the upper portion of the compressor is mounted in a state of being fitted to the entire circumference of the upper end of the noise insulation cover. In this way, a gap which is generated between the noise insulation cap and the upper portion of the noise insulation cover can be reduced, and therefore, the leakage of the noise can be suppressed.

[0012] Further, in the compressor unit according to the above aspect of the present invention, the noise insulation cover is disposed in a state where an entire circumference of an upper side of the noise insulation cover is in contact with a lower surface of a wall portion provided above the compressor.

[0013] In a case where a wall portion such as a drain pan is provided above the compressor, the noise insulation cover is disposed in a state where the entire circumference of the upper side of the noise insulation cover is in contact with the lower surface of the wall portion. In this way, a gap which is generated between the wall portion and the upper side of the noise insulation cover can be reduced, and therefore, the leakage of the noise can be suppressed.

[0014] Further, in the compressor unit according to the above aspect of the present invention, a guide part for guiding the upper side of the noise insulation cover is provided on the lower surface of the wall portion.

[0015] Due to the guide part, the upper side of the noise insulation cover is positioned and it is possible to prevent the noise insulation cover from collapsing or wobbling to secure the contact with the lower surface of the wall portion such as the drain pan.

[0016] Further, an outdoor unit according to an aspect of the present invention includes the compressor unit according to any one of the above aspects, and a housing which accommodates the compressor unit.

Advantageous Effects of Invention

[0017] Since the bottom side of the noise insulation cover is shaped to match the protrusions and recesses of the surface of the bottom plate so as to reduce a gap, a gap which is generated between the bottom side of the noise insulation cover and the bottom plate having the protrusions and recesses can be reduced, so that the leakage of the noise from the bottom side of the noise insulation cover can be suppressed.

Brief Description of Drawings

[0018]

Fig. 1 is a diagram showing a refrigerant circuit of an air conditioner according to an embodiment of the present invention.

Fig. 2 is a perspective view of a compressor unit (without a noise insulation cover) according to the embodiment.

Fig. 3 is a perspective view of a compressor unit in which a noise insulation cover and a noise insulation cap are provided at the compressor of Fig. 2.

Fig. 4 is a perspective view showing the noise insulation cover.

Fig. 5 is a plan view showing the noise insulation cover in an expanded state.

Fig. 6 is a side view showing a method of mounting the noise insulation cap on the noise insulation cover.

Fig. 7 is a perspective view showing a modification example of the noise insulation cover.

Fig. 8 is a perspective view showing another modification example of the noise insulation cover. Description of Embodiments

[0019] Hereinafter, an embodiment of the present invention will be described with reference to the drawings.

[0020] Fig. 1 shows a refrigerant circuit diagram of a multi-type air-conditioning system in which a plurality of indoor units are connected to a single outdoor unit. A plurality of outdoor units may be used.

[0021] As shown in Fig. 1, the multi-type air-conditioning system 1 has a configuration in which a plurality of indoor units 3A and 3B are connected in parallel to a single outdoor unit 2. The plurality of indoor units 3A and 3B are connected in parallel to each other through a branching unit 6 between a gas-side pipe 4 and a liquid-side pipe 5 which are connected to the outdoor unit 2.

[0022] The outdoor unit 2 includes an inverter-driven compressor 10 which compresses a refrigerant, a four-way switching valve 12 which switches a circulation direction of the refrigerant, an outdoor heat exchanger 13 which performs heat exchange between the refrigerant and the outside air, a supercooling coil 14 configured integrally with the outdoor heat exchanger 13, an outdoor expansion valve (EEVH) 15, a receiver 16 which stores a liquid refrigerant, a supercooling heat exchanger 17 which applies supercooling to the liquid refrigerant, a supercooling expansion valve (EEVSC) 18 which controls the amount of the refrigerant which is diverted to the supercooling heat exchanger 17, an accumulator 19 which separates a liquid component from a refrigerant gas which is suctioned into the compressor 10, and causes only a gas component to be suctioned to the compressor 10 side, a gas-side operation valve 20, and a liquid-side operation valve 21.

[0023] The compressor 10 is made to be rotatable at a rotational frequency exceeding 130 rps and up to 200 rps. An oil separator 26 is connected to the discharge side of the compressor 10 through a discharge pipe 25. In the oil separator 26, mist-like lubricating oil (oil) in a compressed refrigerant is separated from the refrigerant. The refrigerant from which the mist-like lubricating oil is separated in the oil separator 26 is led to the four-way switching valve 12. The lubricating oil separated in the oil separator 26 and stored in the oil separator 26 is returned to the low-pressure side of the compressor 10 through an oil return pipe 27.

[0024] An electromagnetic valve 28 and a capillary part 29 are provided in the oil return pipe 27. The opening and closing of the electromagnetic valve 28 is controlled by a control unit (not shown), and thus the amount of oil flowing through the oil return pipe 27 is adjusted. The capillary part 29 is used as a fixed throttle and reduces the pressure of the lubricating oil passing therethrough.

[0025] The above-described respective devices on the outdoor unit 2 side are sequentially connected through a refrigerant pipe 22 to configure a known outdoor-side refrigerant circuit 23. Further, the outdoor unit 2 is provided with an outdoor fan 24 which blows the outside air to the outdoor heat exchanger 13.

[0026] The gas-side pipe 4 and the liquid-side pipe 5 are refrigerant pipes which are connected to the gas-side operation valve 20 and the liquid-side operation valve 21 of the outdoor unit 2, and pipe lengths thereof are appropriately set according to the distance between the outdoor unit 2 and the plurality of indoor units 3A and 3B which are connected to the outdoor unit 2, at the time of installation construction on site. A plurality of branching units 6 are provided in the middle of the gas-side pipe 4 and the liquid-side pipe 5, and an appropriate number of indoor units 3A and 3B are connected through the branching units 6. In this way, a sealed one refrigeration cycle (refrigerant circuit) 7 is configured.

[0027] Each of the indoor units 3A and 3B has an indoor heat exchanger 30 which cools or heats indoor air through heat exchange between the indoor air and the refrigerant to provide it for indoor air conditioning, an indoor expansion valve (EEVC) 31, an indoor fan 32 which circulates the indoor air through the indoor heat exchanger 30, and an indoor controller 33, and the indoor units 3A and 3B are connected to the branching units 6 through branch gas-side pipes 4A and 4B and branch liquid-side pipes 5A and 5B on the indoor side.

[0028] In the multi-type air-conditioning system 1 described above, a cooling operation is performed as follows.

[0029] The high-temperature and high-pressure refrigerant gas compressed and discharged by the compressor 10 is circulated to the outdoor heat exchanger 13 side by the four-way switching valve 12 and is subjected to heat exchange with the outside air which is blown by the outdoor fan 24 in the outdoor heat exchanger 13, thereby being condensed and liquefied. The liquid refrigerant is further cooled by the supercooling coil 14, then passes through the outdoor expansion valve 15, and is temporarily stored in the receiver 16.

[0030] The liquid refrigerant having a circulation amount adjusted by the receiver 16 is partially diverted from a liquid refrigerant pipe in the course of flowing on the liquid refrigerant pipe side via the supercooling heat exchanger 17, and is subjected to heat exchange with the refrigerant adiabatically expanded in the supercooling expansion valve 18, whereby the degree of supercooling is applied thereto. This liquid refrigerant is led from the outdoor unit 2 to the liquid-side pipe 5 via the liquid-side operation valve 21 and diverted to the branch liquid-side pipes 5A and 5B of the indoor units 3A and 3B through the branching units 6.

[0031] The liquid refrigerants diverted to the branch liquid-side pipes 5A and 5B flow into the respective indoor units 3A and 3B, are adiabatically expanded in the indoor expansion valves 31, and flow into the indoor heat exchangers 30 as gas-liquid two-phase flows. In the indoor heat exchanger 30, the indoor air which is circulated by the indoor fan 32 is subjected to heat exchange with the refrigerant to be cooled and is provided for the cooling of the indoor. On the other hand, the refrigerant is gasified, reaches the branching unit 6 via each of the branch gas-side pipes 4A and 4B, and joins the refrigerant gas from another indoor unit at the gas-side pipe 4.

[0032] The refrigerant gas which has joined at the gas-side pipe 4 returns to the outdoor unit 2 again, passes through the gas-side operation valve 20 and the four-way switching valve 12, joins the refrigerant gas from the supercooling heat exchanger 17, and is then introduced into the accumulator 19. In the accumulator 19, the liquid component contained in the refrigerant gas is separated, and only the gas component is suctioned into the compressor 10. This refrigerant is compressed again in the compressor 10, and the cooling operation is performed by repeating the above cycle.

[0033] On the other hand, a heating operation is performed as follows.

[0034] The high-temperature and high-pressure refrigerant gas compressed and discharged by the compressor 10 is circulated to the gas-side operation valve 20 side through the four-way switching valve 12. The high-pressure gas refrigerant is led out from the outdoor unit 2 via the gas-side operation valve 20 and the gas-side pipe 4 and is introduced into the plurality of indoor units 3A and 3B via the branching units 6 and the branch gas-side pipes 4A and 4B on the indoor side.

[0035] The high-temperature and high-pressure refrigerant gas introduced into each of the indoor units 3A and 3B is subjected to heat exchange with the indoor air which is circulated through the indoor fan 32 in the indoor heat exchangers 30, and the indoor air heated in this way is blown into the room to be provided for heating. On the other hand, the refrigerant condensed and liquefied in the indoor heat exchanger 30 reaches the branching unit 6 via the indoor expansion valve 31 and each of the branch liquid-side pipes 5A and 5B, joins the refrigerant from another indoor unit, and returns to the outdoor unit 2 via the liquid-side pipe 5. During the heating, in each of the indoor units 3A and 3B, the degree of opening of the indoor expansion valve 31 is controlled through the indoor controller 33 such that the refrigerant outlet temperature of the indoor heat exchanger 30 functioning as a condenser or the refrigerant supercooling degree reaches a control target value.

[0036] The refrigerant which has returned to the outdoor unit 2 reaches the supercooling heat exchanger 17 via the liquid-side operation valve 21, is supercooled, similar to the case of the cooling, and then flows into the receiver 16 to be temporarily stored therein, whereby the circulation amount is adjusted. This liquid refrigerant is supplied to the outdoor expansion valve 15 to be adiabatically expanded, and then flows into the outdoor heat exchanger 13 via the supercooling coil 14.

[0037] In the outdoor heat exchanger 13, the outside air which is blown from the outdoor fan 24 and the refrigerant perform heat exchange, and thus the refrigerant absorbs heat from the outside air to be evaporated and gasified. This refrigerant passes through the four-way switching valve 12 from the outdoor heat exchanger 13, joins the refrigerant gas from the supercooling heat exchanger 17, is then introduced into the accumulator 19. In the accumulator 19, the liquid component contained in the refrigerant gas is separated, and only the gas component is suctioned into the compressor 10 and compressed again in the compressor 10. The heating operation is performed by repeating the above cycle.

<Structure of Compressor unit>

[0038] Fig. 2 shows the compressor 10 installed on a bottom plate 50 in a housing of the outdoor unit 2. In this drawing, the compressor 10 is mainly shown, and other devices are not shown.

[0039] The compressor 10 is fixed onto the bottom plate 50 of the outdoor unit 2. The compressor 10 has a substantially cylindrical shape having an axis extending in a vertical direction. An electric motor (not shown) is accommodated in a lower portion of the compressor 10, and a compression mechanism (not shown) such as a scroll part is stored in an upper portion. A leg portion 10a is provided at a bottom portion of the compressor 10 and is fixed to the bottom plate 50 by a stud bolt 49 through vibration-proof rubber 48.

[0040] The upstream end of the discharge pipe 25 is connected to a top portion of the compressor 10.

[0041] Fig. 3 shows a state where a noise insulation cover 51 and a noise insulation cap 52 are provided at the compressor 10. Although omitted in Fig. 2, protrusions and recesses provided on the surface of the bottom plate 50 are shown in Fig. 3. The protrusions and recesses are formed by press-forming a metal plate, and the shape thereof is determined in consideration of improvement in the strength of the bottom plate 50 or the drainage property of the bottom plate 50.

[0042] The noise insulation cover 51 is made of a material having a noise insulation function, and for example, felt or the like is used. Further, a PVC (polyvinyl chloride) plate may be bonded thereto for shape retention or the like. The noise insulation cover 51 is provided so as to cover the entire circumference of the side portion of the compressor 10.

[0043] As shown in Fig. 4, the noise insulation cover 51 is fixed in a state where end portions 51a in a circumferential direction are in contact with each other. In this way, the end portions 51a of the noise insulation cover 51 are connected to each other without any gap in an up-down direction. For the fixing of the end portions 51a of the noise insulation cover 51, for example, a magnet is used. By using the magnet, mounting and dismounting can be performed easily, and thus workability is improved.

[0044] Fig. 5 shows a state where the noise insulation cover 51 is expanded. A bottom side 51b of the noise insulation cover 51 is shaped to have protrusions and recesses. The protrusions and recesses are shaped to match the protrusions and recesses (refer to Fig. 3) of the bottom plate 50, and the shape of the bottom side 51b is determined such that the protrusions and recesses come into in contact with the protrusions and recesses of the bottom plate 50 without a gap. In this way, the bottom side 51b of the noise insulation cover 51 comes into contact with the bottom plate 50 having the protrusions and recesses, over the entire circumference.

[0045] As shown in Fig. 3, the noise insulation cap 52 is made of a material having a noise insulation function, and for example, felt or the like is used. Further, a PVC (polyvinyl chloride) plate may be bonded thereto for shape retention or the like. The noise insulation cap 52 is provided so as to cover the upper portion of the compressor 10. The noise insulation cap 52 includes a disk-shaped upper portion 52a and a tubular portion 52b provided over the outer circumference of the upper portion 52a. The noise insulation cap 52 is fitted such that the outer peripheral surface of the noise insulation cover 51 is in contact with the entire circumference of the inner peripheral surface of the tubular portion 52b.

[0046] A cutout portion 52c cut out in an axial direction from an open end is formed in the tubular portion 52b. The cutout portion 52c is also formed at a position on the opposite side by 180° when the noise insulation cap 52 is viewed from above. By forming the cutout portions 52c in this manner, as shown in Fig. 6, it is possible to bend the noise insulation cap 52 by utilizing the cutout portions 52c when the noise insulation cap 52 is fitted to the upper end of the noise insulation cover 51. In this way, the workability when mounting the noise insulation cap 52 on the noise insulation cover 51 is improved.

[0047] According to this embodiment, the following operational effects are exhibited.

[0048] By covering the entire circumference of the side portion of the compressor 10 by using the noise insulation cover 51, the noise which is generated from the compressor 10 can be suppressed. The bottom side 51b of the noise insulation cover 51 is in contact with the bottom plate 50 at the entire circumference thereof and is shaped to match the protrusions and recesses of the surface of the bottom plate 50. In this way, a gap which is generated between the bottom side 51b of the noise insulation cover 51 and the bottom plate 50 having the protrusions and recesses can be reduced, and therefore, it is possible to suppress the leakage of the noise from the bottom side 51c of the noise insulation cover 51.

[0049] The noise insulation cap 52 which covers the upper portion of the compressor 10 is mounted in a state of being fitted to the entire circumference of the upper end of the noise insulation cover 51. In this way, a gap which is generated between the noise insulation cap 52 and the upper portion of the noise insulation cover 51 can be reduced, and therefore, the leakage of the noise can be suppressed.

[0050] Instead of bringing the end portions 51a of the noise insulation cover 51 into contact with each other, as described using Fig. 4, a configuration may be made in which the end portions 51a overlap each other in a thickness direction and hook-and-loop fasteners such as the Magic tape (registered trademark) are provided over the entirety in the up-down direction of the overlapping portions so as to fix the overlapping portions to each other, as shown in Fig. 7. Even with this configuration, the end portions 51a of the noise insulation cover 51 can be connected to each other without a gap.

[0051] Further, as shown in Fig. 8, the noise insulation may be performed only by the noise insulation cover 51 without using the cap 52. Specifically, the upper portion of the noise insulation cover 51 is extended upward such that an upper side 51c of the noise insulation cover 51 comes into contact with the lower surface of a wall portion (for example, an intermediate drain pan) 53 above the compressor 10 over the entire circumference. In this

modification example, the shape of the upper side 51c is determined in accordance with the inclined shape of the lower surface of the wall portion 53 which is a drain pan. In this way, a gap which is generated between the wall portion 53 and the upper side 51c of the noise insulation cover 51 can be reduced, and therefore, the leakage of the noise can be suppressed.

[0052] Further, a plurality of guide pieces (guide parts) 55 which are made of sheet metal and extend downward are provided on the lower surface of the drain pan 53. Each of the guide pieces 55 is provided so as to guide the inner peripheral surface of the upper side of the noise insulation cover 51, and a plurality of (for example, three) guide pieces 55 are provided at substantially equal intervals in the circumferential direction. In this way, the noise insulation cover 51 is positioned, and it is possible to prevent the noise insulation cover 51 from collapsing or wobbling and to secure the contact with the lower surface of the drain pan 53.

[0053] Instead of the guide piece 55 made of sheet metal, the lower surface of the drain pan 53 may be press-formed so as to protrude downward such that the protruding portion is used as the guide part of the noise insulation cover 51.

[0054] Further, in the embodiment described above, the compressor 10 rotatable at a rotational frequency exceeding 130 rps and up to 200 rps has been described. However, the present invention is not limited thereto, and the rotational frequency of the compressor may be 130 rps or less, or may exceed 200 rps.

Reference Signs List

[0055]

1:	multi-type air-conditioning system
2:	outdoor unit
3A, 3B:	indoor unit
10:	compressor
10a:	leg portion
13:	outdoor heat exchanger
25:	discharge pipe
48:	vibration-proof rubber
49:	stud bolt
50:	bottom plate
51:	noise insulation cover
51a:	end portion
51b:	bottom side
52:	noise insulation cap
52a:	upper portion
52b:	tubular portion
52c:	cutout portion
55:	guide piece (guide part)

Claims

1. A compressor unit comprising:

a compressor which is installed on a bottom plate having protrusions and recesses on a surface thereof and compresses a refrigerant; and
a noise insulation cover which covers an entire circumference of a side portion of the compressor and is disposed in a state where an entire circumference thereof is in contact with the bottom plate in a bottom side shape to match the protrusions and recesses.

2. The compressor unit according to claim 1, further comprising:

a noise insulation cap which covers an upper portion of the compressor,
wherein the noise insulation cap is mounted in a state of being fitted to an entire circumference of an upper end of the noise insulation cover.

3. A compressor unit comprising:

a compressor which compresses a refrigerant;
a noise insulation cover which covers an entire circumference of a side portion of the compressor; and
a noise insulation cap which covers an upper portion of the compressor,
wherein the noise insulation cap is mounted in a state of being fitted to an entire circumference of an upper end of the noise insulation cover.

4. The compressor unit according to claim 1, wherein the noise insulation cover is disposed in a state where an entire circumference of an upper side of the noise insulation cover is in contact with a lower surface of a wall portion provided above the compressor.

5. A compressor unit comprising:

a compressor which compresses a refrigerant; and
a noise insulation cover which covers an entire circumference of a side portion of the compressor,
wherein the noise insulation cover is disposed in a state where an entire circumference of an upper side of the noise insulation cover is in contact with a lower surface of a wall portion provided above the compressor.

6. The compressor unit according to claim 4 or 5, wherein a guide part for guiding the upper side of the noise insulation cover is provided on the lower surface of the wall portion.

7. An outdoor unit comprising:

the compressor unit according to any one of claims 1 to 6; and
a housing which accommodates the compressor unit.

Amended claims under Art. 19.1 PCT

1. A compressor unit comprising:

a compressor which is installed on a bottom plate having protrusions and recesses on a surface thereof and compresses a refrigerant; and
a noise insulation cover which covers an entire circumference of a side portion of the compressor and is disposed in a state where an entire circumference thereof is in contact with the bottom plate in a bottom side shape to match the protrusions and recesses.

2. (Amended) The compressor unit according to claim 1, further comprising:

a noise insulation cap which covers an upper portion of the compressor,
wherein the noise insulation cap includes an upper portion and a tubular portion provided over an outer circumference of the upper portion, and is mounted in a state where the tubular portion is fitted to an entire circumference of an upper end of the noise insulation cover, and
a cutout portion cut out from an open end in an axial direction is formed in the tubular portion.

3. (Amended) A compressor unit comprising:

a compressor which compresses a refrigerant;
a noise insulation cover which covers an entire circumference of a side portion of the compressor; and
a noise insulation cap which covers an upper portion of the compressor,
wherein the noise insulation cap includes an upper portion and a tubular portion provided over an outer circumference of the upper portion, and is mounted in a state where the tubular portion is fitted to an entire circumference of an upper end of the noise insulation cover, and
a cutout portion cut out from an open end in an axial direction is formed in the tubular portion.

4. The compressor unit according to claim 1, wherein the noise insulation cover is disposed in a state where an entire circumference of an upper side of the noise insulation cover is in contact with a lower surface of a wall portion provided above the compressor.

5. A compressor unit comprising:

a compressor which compresses a refrigerant; and
a noise insulation cover which covers an entire circumference of a side portion of the compressor,
wherein the noise insulation cover is disposed in a state where an entire circumference of an upper side of the noise insulation cover is in contact with a lower surface of a wall portion provided above the compressor.

6. The compressor unit according to claim 4 or 5, wherein a guide part for guiding the upper side of the noise insulation cover is provided on the lower surface of the wall portion.

7. An outdoor unit comprising:

the compressor unit according to any one of claims 1 to 6; and
a housing which accommodates the compressor unit.

FIG. 1

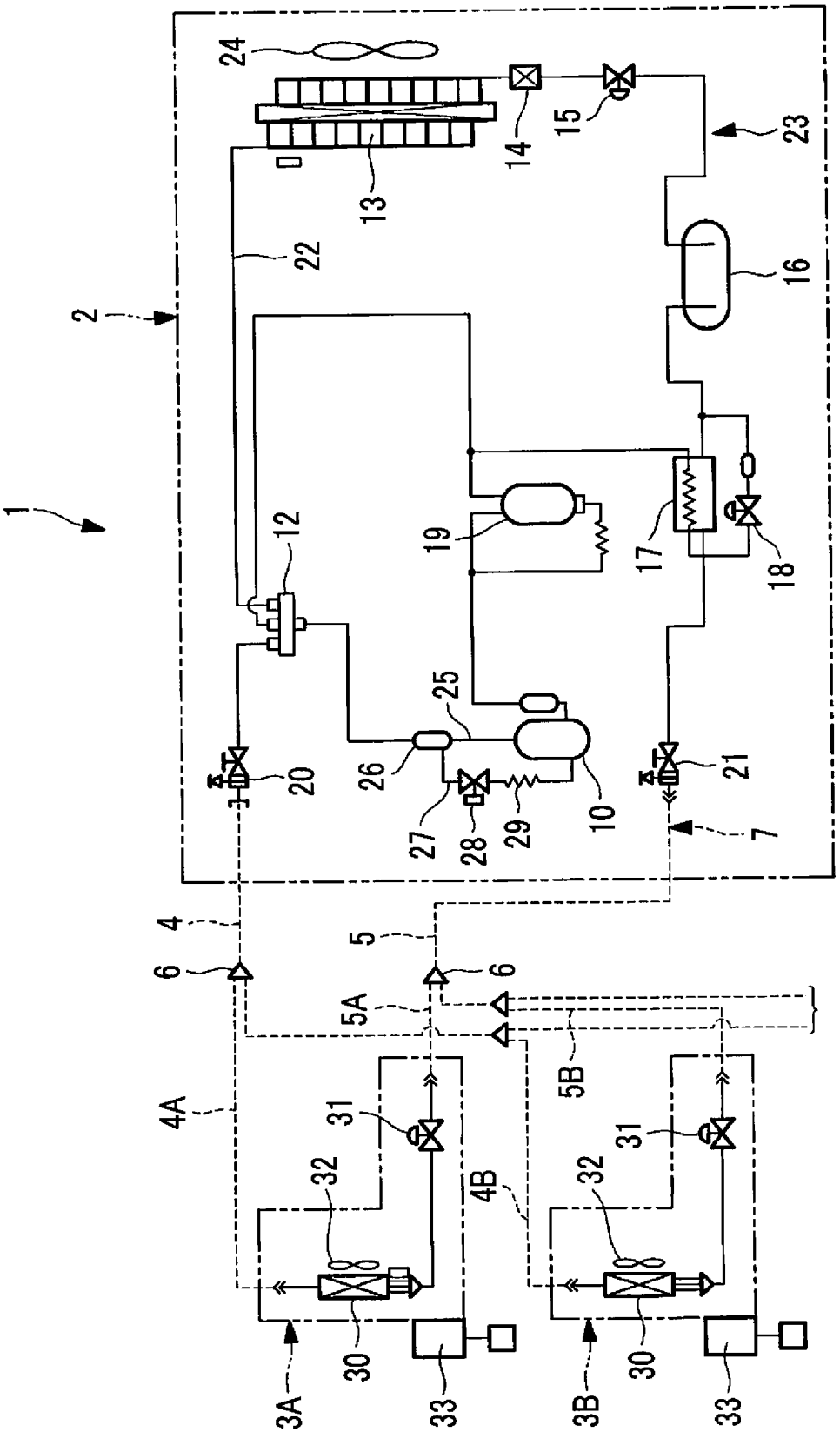

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FIG. 2

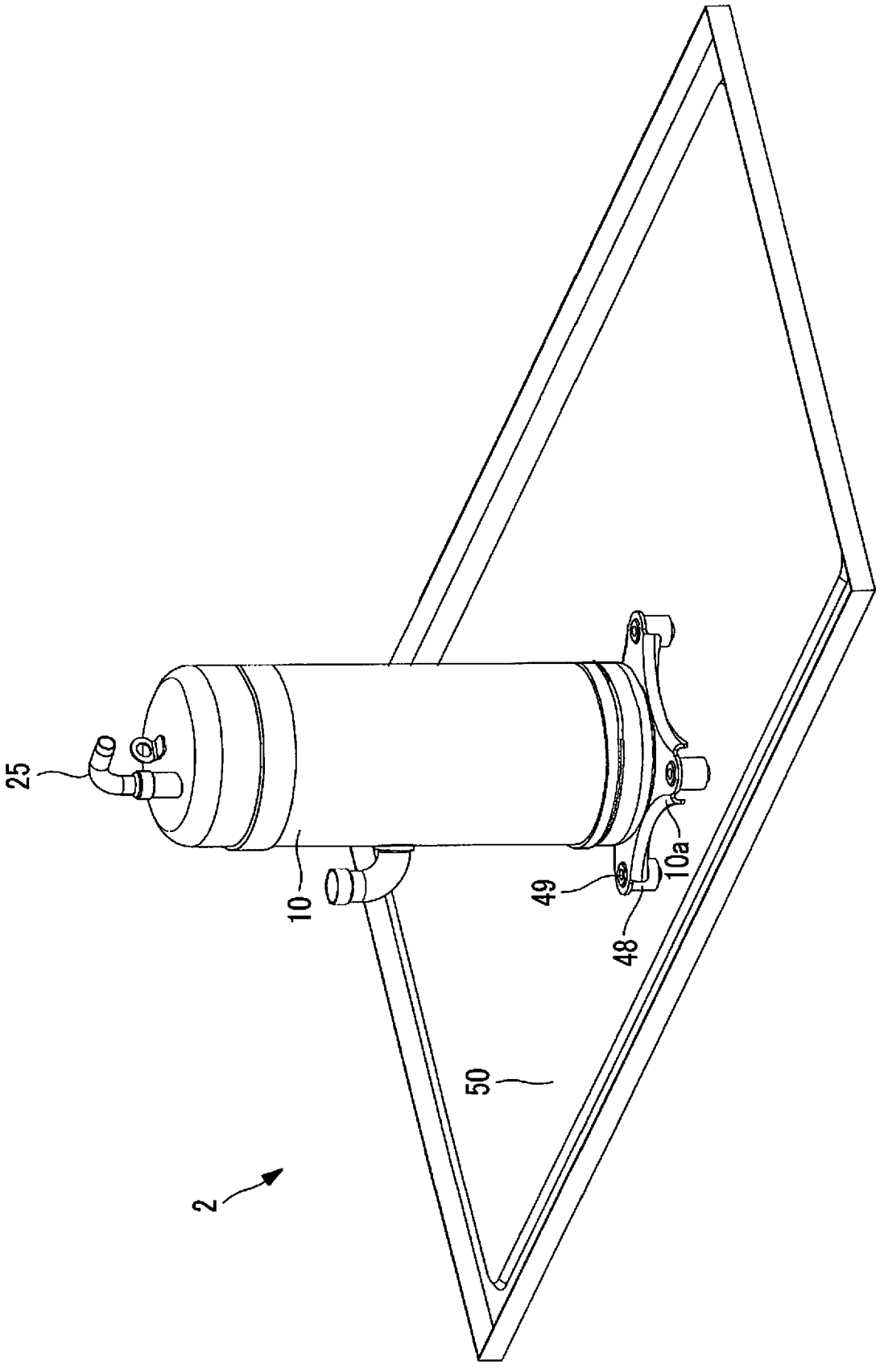


FIG. 3

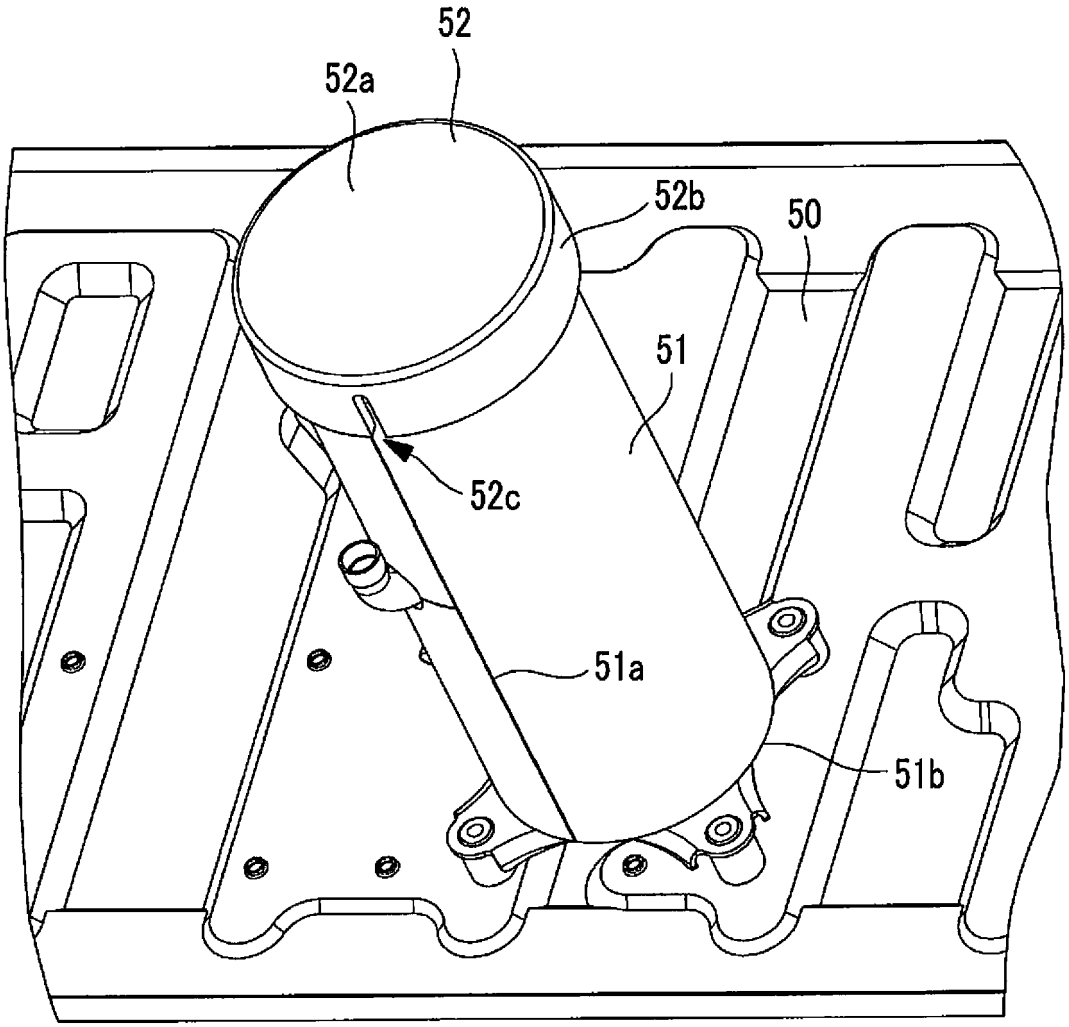


FIG. 4

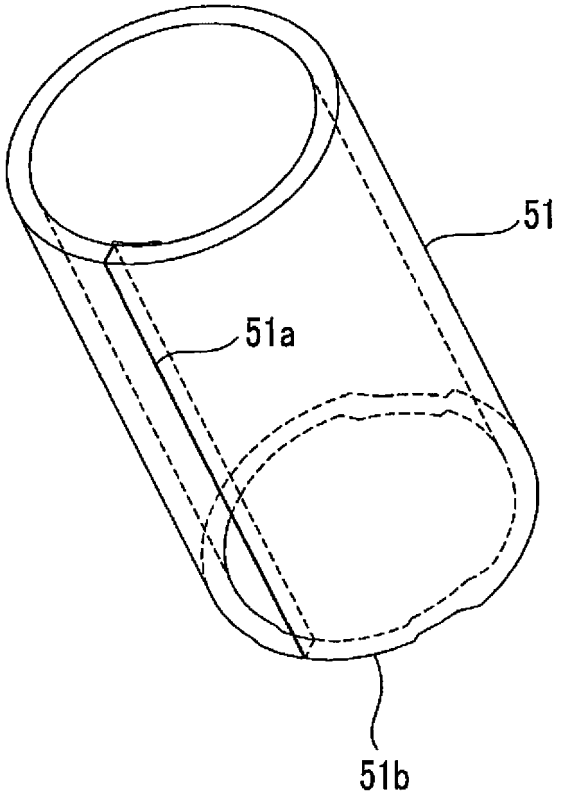


FIG. 5

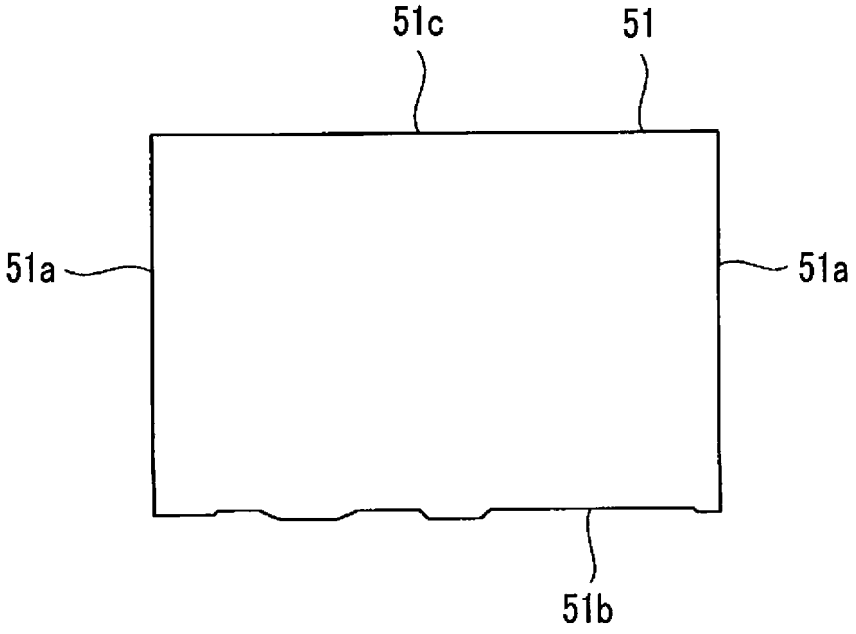


FIG. 6

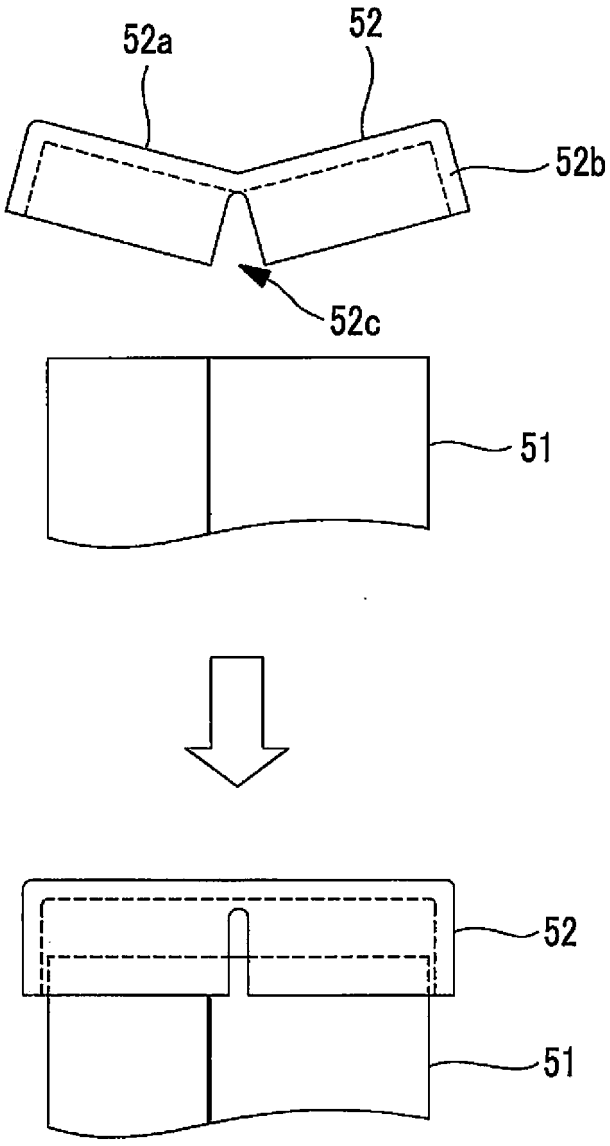


FIG. 7

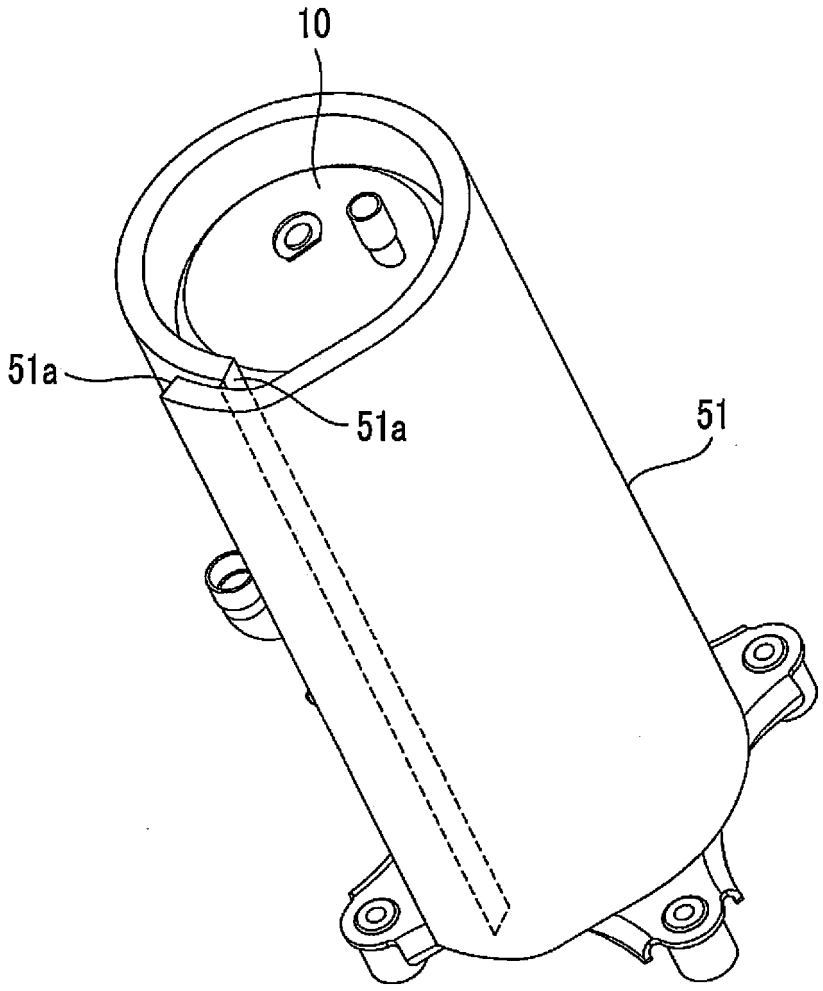
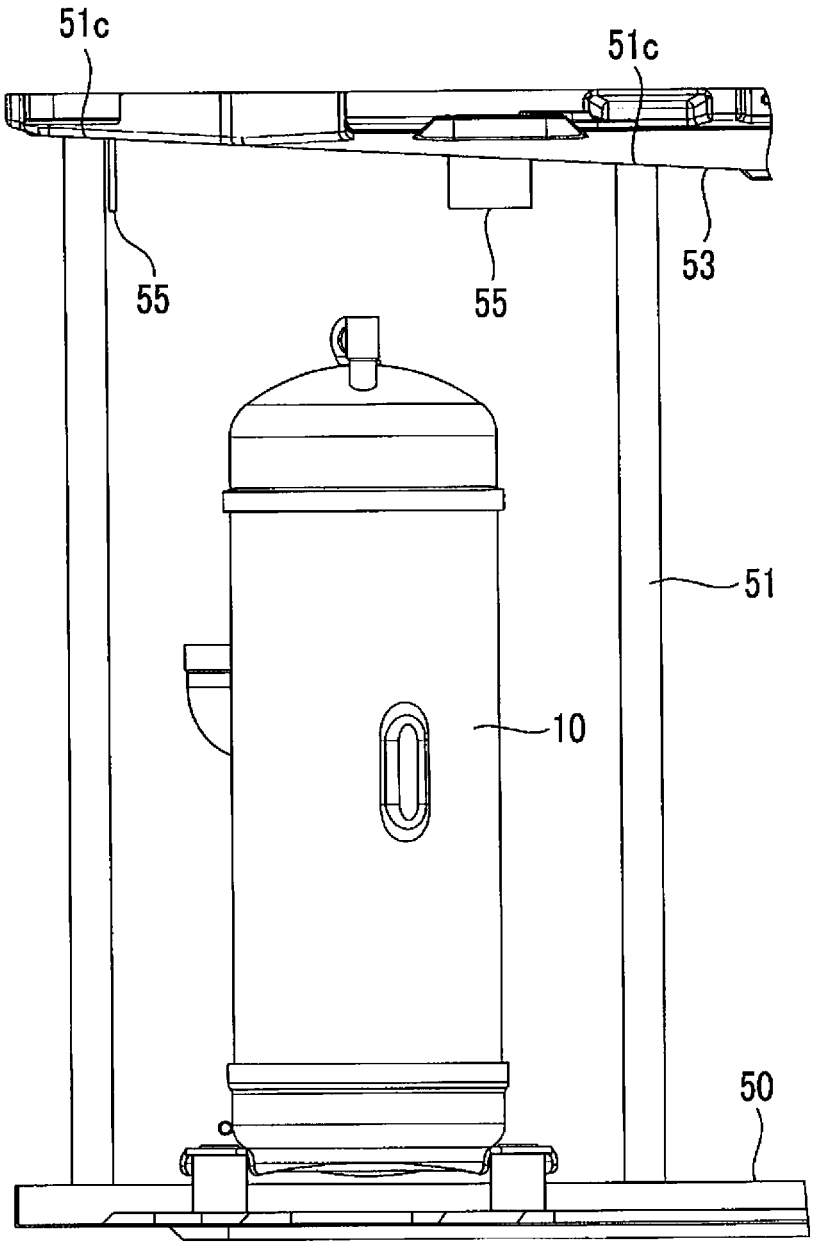


FIG. 8



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2017/043688

A. CLASSIFICATION OF SUBJECT MATTER
Int. Cl. F24F1/12(2011.01)i, F24F1/40(2011.01)i, F24F13/24(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
Int. Cl. F24F1/12, F24F1/40, F24F13/24

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched
Published examined utility model applications of Japan 1922-1996
Published unexamined utility model applications of Japan 1971-2018
Registered utility model specifications of Japan 1996-2018
Published registered utility model applications of Japan 1994-2018

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y A	JP 2013-87999 A (DAIKIN INDUSTRIES, LTD.) 13 May 2013, paragraphs [0002]-[0007], [0016], [0028]-[0035], [0039]-[0040], fig. 2, 5 (Family: none)	1-2, 7 3-6
Y	JP 2013-53827 A (DAIKIN INDUSTRIES, LTD.) 21 March 2013, paragraphs [0001]-[0008], [0040]-[0041], [0064]-[0067], fig. 6 (Family: none)	1-2, 7

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

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"&" document member of the same patent family

Date of the actual completion of the international search	Date of mailing of the international search report
Name and mailing address of the ISA/ Japan Patent Office 3-4-3, Kasumigaseki, Chiyoda-ku, Tokyo 100-8915, Japan	Authorized officer Telephone No.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2017/043688

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X Y	JP 2011-179709 A (MITSUBISHI ELECTRIC CORP.) 15 September 2011, paragraphs [0010]-[0019], fig. 1-3 (Family: none)	3, 7 2
X Y	JP 2015-135104 A (SAMSUNG R&D INSTITUTE JAPAN CO., LTD., PARKER CORP.) 27 July 2015, paragraphs [0001]-[0002], [0020]-[0026], [0036]-[0037], [0039], fig. 4-6, 18 (Family: none)	3, 7 2
A	JP 61-240041 A (MATSUSHITA ELECTRIC INDUSTRIAL CO., LTD.) 25 October 1986, entire text, all drawings (Family: none)	4-6
A	JP 7-208771 A (TOSHIBA CORP.) 11 August 1995, entire text, all drawings (Family: none)	4-6

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REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP 6018825 A **[0004]**
- JP 60049280 A **[0004]**