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(54) **Outdoor unit of air conditioner**

(57) Provided is an outdoor unit (1) of an air conditioner. In the outdoor unit, when an anti-vibration member (20) is placed on the top surface of a base pan (10) forming the bottom surface of the outdoor unit, the anti-vibration member (20) is guided by a guide member (11) disposed on the top surface of the base pan. In a state where

a portion of the anti-vibration member (20) is inserted through a base plate (31) of a compressor (30), the base pan (10), the anti-vibration member (20), and the compressor (30) are fixed using a coupling member. Therefore, the compressor can be fixed more easily and simply.

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Description

[0001] The present disclosure relates to an air conditioner, and more particularly, to an outdoor unit of an air conditioner in which a compressor can be easily fixed.

[0002] Air conditioners are used to cool and/or heat an indoor area through heat exchange between refrigerant and indoor/outdoor air. A split type air conditioner includes an indoor unit and an outdoor unit. The indoor unit is used to cool or heat indoor air through heat exchange between refrigerator and the indoor air, and the outdoor unit is used to cool or heat outdoor air through heat exchange between the refrigerator and the outdoor air.

[0003] In the outdoor unit, a compressor is disposed to compress the refrigerator to a high-temperature and high-pressure state. In a state where a fixing bolt welded to a base pan forming the bottom surface of the outdoor unit is inserted through a penetration hole formed through a base plate of the compressor, a fixing nut is coupled to the fixing bolt to fixing the compressor. However, the outdoor unit of an air conditioner of the related art has the following limitations.

[0004] As described above, in a state where the fixing bolt is previously fixed to the base pan, the fixing bolt is inserted through the penetration hole of the base plate to fix the compressor. Therefore, it is difficult to place the compressor having a weight of about 30 kg to 40 kg in a manner such that the fixing bolt is aligned with the penetration hole and inserted into the penetration hole.

[0005] In addition, if the compressor is not exactly placed, the compressor should be repositioned to a proper position. Furthermore, while the compressor is repositioned, the fixing bolt or other parts such as an anti-vibration member can be damaged.

[0006] Embodiments provide an outdoor unit of an air conditioner that can be fixed in a simple manner.

[0007] Embodiments also provide an outdoor unit of an air conditioner that is configured to be exactly fixed.

[0008] In an embodiment, an outdoor unit of an air conditioner, the outdoor unit comprising a plurality of parts for a heat exchange cycle, the plurality of parts comprising a base fan forming a bottom surface of the outdoor unit and a compressor, the outdoor unit being characterized in that the outdoor unit further comprises: a guide member disposed at the base pan; a grommet configured to be placed at a top surface of the base pan while being guided by the guide member; a fixing part configured to be inserted through the compressor, the grommet, and the guide member; and a coupling part configured to fix the base pan, the grommet, and the compressor.

[0009] In another embodiment, an outdoor unit of an air conditioner, in which a plurality of parts including a compressor are disposed, the outdoor unit **characterized in that** the outdoor unit comprises: a base pan forming a bottom surface of the outdoor unit; a guide protrusion disposed on a top surface of the base pan; a guide boss disposed on the top surface of the base pan at a position close to the guide protrusion; an anti-vibration

member configured to be placed on the top surface of the base pan while being guided by the guide protrusion and the guide boss; a compressor comprising a base plate at a side thereof, the base plate being supported by the anti-vibration member in a state where a side of the anti-vibration member is inserted through the base plate; and a fixing member configured to fix the base plate to the top surface of the base pan.

[0010] According to embodiments, a compressor can be fixed more simply and exactly.

[0011] The details of one or more embodiments are set forth in the accompanying drawings and the description below. Other features will be apparent from the description and drawings, and from the claims.

[0012] Fig. 1 is a perspective view illustrating an outdoor unit of an air conditioner according to a first embodiment.

[0013] Fig. 2 is an exploded perspective view illustrating characteristic parts according to the first embodiment.

[0014] Fig. 3 is a longitudinal sectional view illustrating the characteristic parts according to the first embodiment.

[0015] Figs. 4 to 7 are longitudinal sectional views for explaining how a compressor is fixed in the outdoor unit of the air conditioner according to the first embodiment.

[0016] Fig. 8 is an exploded perspective view illustrating characteristic parts of an outdoor unit of an air conditioner according to a second embodiment.

[0017] An outdoor unit of an air conditioner will now be described in detail according to a first embodiment with reference to the accompanying drawings.

[0018] Fig. 1 is a perspective view illustrating an outdoor unit 1 of an air conditioner according to a first embodiment; Fig. 2 is an exploded perspective view illustrating characteristic parts according to the first embodiment; and Fig. 3 is a longitudinal sectional view illustrating the characteristic parts according to the first embodiment.

[0019] Referring to Figs. 1 to 3, a base pan 10 forms the bottom surface of the outdoor unit 1. Various parts such as a compressor 30, an accumulator 40, an outdoor heat exchanger (not shown), and a blower fan (not shown) are disposed in the outdoor unit 1. The compressor 30 is fixed in a state where the compressor 30 is placed on the top surface of the base pan 10, that is, the bottom surface of the outdoor unit 1.

[0020] Referring to Figs. 2 and 3, the base pan 10 includes a plurality of guide protrusions 11 (one shown in Figs. 2 and 3). The guide protrusion 11 is formed by an upwardly protruded portion of the base pan 10. The guide protrusion 11 is used to temporarily fix the compressor 30, substantially, a grommet 20 (described later).

[0021] A penetration hole 13 is vertically formed through the guide protrusion 11. Practically, the penetration hole 13 may be formed by cutting a portion of the base pan 10 corresponding to the guide protrusion 11.

[0022] A plurality of grommets 20 are placed on the top surface of the base pan 10. The grommets 20 may function as anti-vibration members for supporting the

compressor 30 and absorbing vibrations generating when the compressor 30 operates. For example, the grommets 20 may be formed of a material having predetermined elasticity. In detail, each of the grommets 20 includes a support part 21 and an insertion part 23.

[0023] The support part 21 makes contact with the top surface of the base pan 10 when the grommet 20 is placed on the base pan 10. A receiving groove 25 is formed on the bottom surface of the support part 21 to receive the guide protrusion 11. The receiving groove 25 is formed by upwardly recessing a portion of the bottom surface of the support part 21.

[0024] The insertion part 23 is disposed at the top surface of the support part 21. The insertion part 23 is inserted through a penetration opening 33 of a base plate 31 (described later). When the insertion part 23 is inserted through the penetration opening 33 of the base plate 31, an upper portion of the insertion part 23 protrudes upward from the base plate 31. After the insertion part 23 is inserted through the penetration opening 33 of the base plate 31, the insertion part 23 may not be freely released from the penetration opening 33. For this, the insertion part 23 may be tightly fitted into the penetration opening 33. In addition, the upper portion of the insertion part 23 protruded upwardly from the base plate 31 may be wider than the penetration opening 33 of the base plate 31.

[0025] The support part 21 and the insertion part 23 may be substantially formed in one piece, or the support part 21 and the insertion part 23 may be formed separately and fixed to each other. A penetration hole 27 is formed through the grommet 20. Substantially, the penetration hole 27 is vertically formed through the support part 21 and the insertion part 23. When the grommet 20 is placed on the top surface of the base pan 10, the penetration hole 27 of the grommet 20 communicates with the penetration hole 13 of the guide protrusion 11.

[0026] The base plate 31 is fixed to the bottom surface of the compressor 30. The base plate 31 is used to fix the compressor 30 to the base pan 10, and the shape of the base plate 31 is approximately rectangular. However, the shape of the base plate 31 is not limited to the rectangular shape.

[0027] A plurality of penetration openings 33 are formed through the base plate 31. Each of the penetration openings 33 may be formed by cutting a portion of the base plate 31. The insertion part 23 of the grommet 20 is inserted through the penetration opening 33 of the base plate 31 to support the compressor 30 using the grommet 20. As described above, after the insertion part 23 of the grommet 20 is inserted through the penetration opening 33 of the base plate 31, the insertion part 23 is not freely released from the penetration opening 33 because the insertion part 23 is tightly fitted into the penetration opening 33 or the upper portion of the insertion part 23 protruded upward from the base plate 31 when the insertion part 23 is inserted through the penetration opening 33 is relatively wider than the penetration opening 33.

[0028] A plurality of fixing bolts (B) and a plurality of fixing nuts (N) are used to fix the compressor 30 to the base pan 10. In a state where the grommets 20 are placed on the base pan 10 and the compressor 30 is supported on the grommets 20, in a state where the insertion parts 23 of the grommets 20 are inserted in the penetration openings 33 of the base plate 31, the fixing bolts (B) are inserted sequentially through the penetration holes 27 of the grommets 20 and the penetration holes 13 of the guide protrusions 11. The fixing nuts (N) are coupled to leading ends of the fixing bolts (B) inserted through the penetration holes 27 of the grommets 20 and the penetration holes 13 of the guide protrusions 11. The fixing nuts (N) may be previously fixed to the bottom surface of the base pan 10 by, for example, welding. In this case, the fixing bolts (B) may be coupled to the fixing nuts (N) while the fixing bolts (B) are inserted through the penetration holes 27 of the grommets 20 and the penetration holes 13 of the guide protrusions 11.

[0029] Hereinafter, an detailed explanation will be given on procedures for fixing the compressor 30 of the outdoor unit 1 of the air conditioner according to the first embodiment with reference to the accompanying drawings.

[0030] Figs. 4 to 7 are longitudinal sectional views for explaining how the compressor 30 is fixed in the outdoor unit 1 of the air conditioner according to the first embodiment.

[0031] Referring to Fig. 4, the grommet 20 is placed on the top surface of the base pan 10. At this time, the guide protrusion 11 is inserted in the receiving groove 25, and the penetration hole 13 of the guide protrusion 11 is aligned with the penetration hole 27 of the grommet 20.

[0032] Referring to Fig. 5, the compressor 30 is placed in a manner such that the grommet 20 (that is, the insertion part 23 of the grommet 20) is inserted in the penetration opening 33. Therefore, the compressor 30 (substantially, the base plate 31) can be supported on the grommet 20.

[0033] Alternatively, the grommet 20 may be placed on the top surface of the base pan 10 after the compressor 30 is supported on the compressor 30. That is, after the grommet 20 is brought into contact with the bottom surface of the base plate 31 by inserting the insertion part 23 of the grommet 20 through the penetration opening 33, both the grommet 20 and the compressor 30 supported on the grommet 20 may be placed on the top surface of the base pan 10.

[0034] Referring to Fig. 6, in a state where the grommet 20 is placed on the top surface of the base pan 10 and the compressor 30 is supported on the grommet 20, a fixing bolt (B) is inserted sequentially through the penetration hole 27 of the grommet 20 and the penetration hole 13 of the guide protrusion 11.

[0035] Referring to Fig. 7, a fixing nut (N) is coupled to a leading end of the fixing bolt (B) which is protruded downward from the base pan 10 after the fixing bolt (B)

is inserted through the penetration hole 27 of the grommet 20 and the penetration hole 13 of the guide protrusion 11. Therefore, the grommet 20 and the base pan 10 are compressed, and thus the compressor 30 can be securely fixed to the base pan 10.

[0036] The fixing bolt (B) and the fixing nut (N) may be coupled to each other as follows. In the case where the fixing bolt (B) and the fixing bolt (B) are coupled to each other in a state where the fixing nut (N) is previously fixed to the bottom surface of the base pan 10, the fixing bolt (B) may be coupled to the fixing nut (N) as the fixing bolt (B) is inserted through the penetration hole 27 of the grommet 20 and the penetration hole 13 of the guide protrusion 11.

[0037] Next, a detailed explanation will be given on an outdoor unit of an air conditioner according to a second embodiment with reference to the accompanying drawing.

[0038] Fig. 8 is an exploded perspective view illustrating characteristic parts of an outdoor unit of an air conditioner according to a second embodiment. In the following explanation of the second embodiment, the same elements as those of the first embodiment will be denoted by the same reference numerals, and detailed descriptions thereof will be omitted.

[0039] Referring to Fig. 8, in the current embodiment, a guide protrusion 11 and a guide boss 15 are disposed at the top surface of a base pan 10. The guide boss 15 is spaced a predetermined distance from the outer side of the guide protrusion 11 and is formed by making a portion of the base pan 10 protuberant upwardly in a manner such that the guide boss 15 form a surface corresponding to the cross-section of a grommet 20 that will be placed on the top surface of the base pan 10. In the current embodiment, at least the lower end portion of the grommet 20 has a cylindrical shape, and the guide boss 15 forms a circular surface corresponding to the grommet 20. Furthermore, the inner diameter of the guide boss 15 may be equal to or greater than the outer diameter of the grommet 20.

[0040] While the grommet 20 is placed on the top surface of the base pan 10, the guide boss 15 guides the grommet 20. In detail, when the grommet 20 is placed on the top surface of the base pan 10, the guide protrusion 11 is inserted in a receiving groove (not shown) formed in the bottom surface of the grommet 20. At this time, the outer surface of the lower end portion of the grommet 20 makes contact with the inner surface of the guide boss 15 or is guided by the inner surface of the guide boss 15, so that the grommet 20 can be guided to a proper position of the top surface of the base pan 10.

[0041] In the current embodiment, other elements or structures such as a compressor 30, a base plate 31, a penetration opening 33, a fixing bolt (B), and a fixing nut (N) are the same as those of the first embodiment.

[0042] In the current embodiment, when the grommet 20 is placed on the top surface of the base pan 10, the grommet 20 can be exactly guided to a proper position

of the top surface of the base pan 10 owing to the guide boss 15. Therefore, since the grommet 20 can be exactly placed on the top surface of the base pan 10, the compressor 30 can be fixed more exactly.

5 [0043] In the above-described embodiments, a fixing bolt and a fixing nut are used as fixing members for fixing the compressor. However, the fixing members are not limited to the fixing bolt and fixing nut. That is, any fixing part that can be inserted through the bottom surface of the outdoor unit, the compressor, and the grommet, and
10 any coupling part that can be coupled to the fixing part can be used as the fixing members.

[0044] As described above, in the outdoor unit of the air conditioner, the compressor can be fixed in a state
15 where the compressor is placed at a proper position. Therefore, the compressor can be fixed more simply and exactly.

20 Claims

1. An outdoor unit of an air conditioner, the outdoor unit comprising a plurality of parts for a heat exchange cycle, the plurality of parts comprising a base fan forming a bottom surface of the outdoor unit and a compressor, the outdoor unit being **characterized**
25 **in that** the outdoor unit further comprises:

a guide member disposed at the base pan;
a grommet configured to be placed at a top surface of the base pan while being guided by the guide member;
a fixing part configured to be inserted through the compressor, the grommet, and the guide member; and
35 a coupling part configured to fix the base pan, the grommet, and the compressor.

2. The outdoor unit according to claim 1, wherein the guide member is formed by an upwardly protruded portion of the base pan.
40
3. The outdoor unit according to claim 1 or 2, wherein the guide member is configured to be inserted in the grommet.
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4. The outdoor unit according to claim 1 or 2, wherein the guide member is configured to make contact with an outer surface of the grommet.

5. The outdoor unit according to any of claims 1 to 4, wherein the grommet comprises:
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a support part configured to be placed on the top surface of the base pan; and
an insertion part extending from the support part to be inserted through a side of the compressor.

6. The outdoor unit according to any of claims 1 to 5, wherein in a state where a portion of the grommet is inserted through a side of the compressor, the fixing part is inserted sequentially through a hole of the grommet and a hole of the base pan formed at an inside of the guide member and is coupled to the coupling part.
7. The outdoor unit according to any of claims 1 to 6, wherein the coupling part is fixed to a bottom surface of the base pan, and
in a state where a portion of the grommet is inserted through a side of the compressor, the fixing part is sequentially inserted through the grommet and the guide member and protruded downward from the base pan, so that the coupling part is coupled to an end of the fixing part protruded downward from the base pan.
8. An outdoor unit of an air conditioner, in which a plurality of parts including a compressor are disposed, the outdoor unit **characterized in that** the outdoor unit comprises:

a base pan forming a bottom surface of the outdoor unit;
a guide protrusion disposed on a top surface of the base pan;
a guide boss disposed on the top surface of the base pan at a position close to the guide protrusion;
an anti-vibration member configured to be placed on the top surface of the base pan while being guided by the guide protrusion and the guide boss;
a compressor comprising a base plate at a side thereof, the base plate being supported by the anti-vibration member in a state where a side of the anti-vibration member is inserted through the base plate; and
a fixing member configured to fix the base plate to the top surface of the base pan.
9. The outdoor unit according to claim 8, wherein the guide boss is disposed around the guide protrusion and has a circular cross-section having a predetermined diameter.
10. The outdoor unit according to claim 8 or 9, wherein the guide protrusion is configured to be inserted into the anti-vibration member, and the guide boss is configured to make contact with an outer surface of the anti-vibration member.
11. The outdoor unit according to claim 10, wherein in a state where the guide protrusion is inserted in the anti-vibration member and the anti-vibration member is inserted through the base plate, a hole of the guide protrusion and a hole of the anti-vibration member are vertically arranged in communication with each other.
12. The outdoor unit according to any of claims 8 to 11, wherein the fixing member comprises:

a fixing part inserted sequentially through the anti-vibration member and the base pan in a state where the anti-vibration member is inserted through the base plate; and
a coupling part coupled to the fixing part inserted sequentially through the anti-vibration member and the base pan.
13. The outdoor unit according to claim 12, wherein the fixing part penetrates the guide protrusion inserted through the anti-vibration member.
14. The outdoor unit according to claim 12 or 13, wherein in a state where the coupling part is previously fixed to a bottom surface of the outdoor unit, the fixing part and the coupling part are coupled to each other.

FIG.1

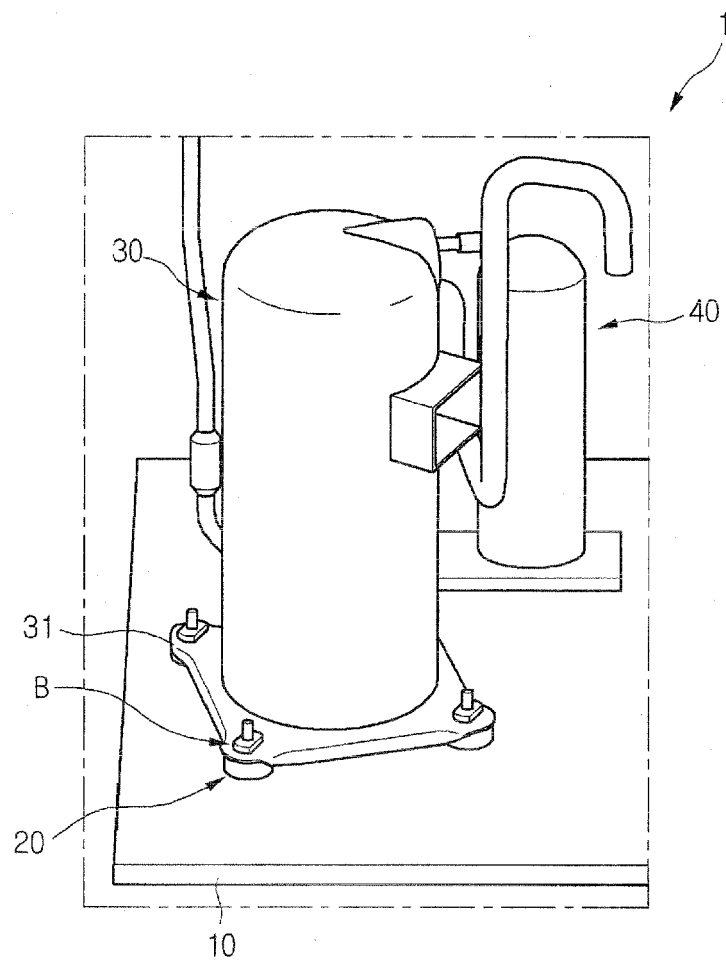


FIG.2

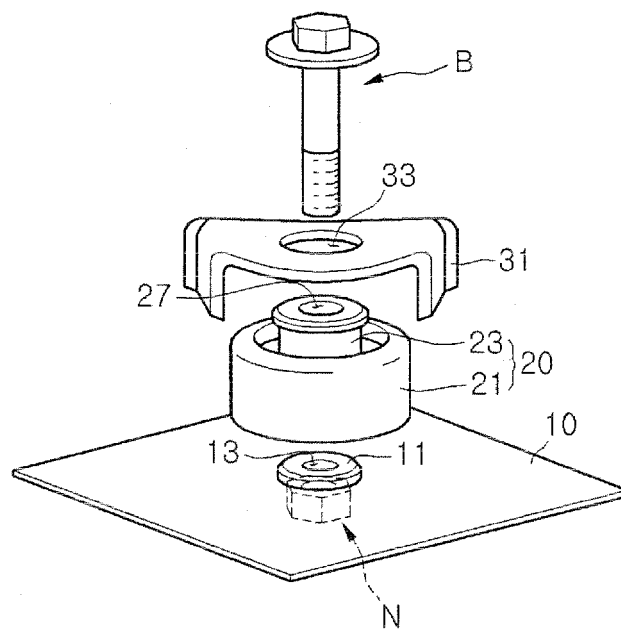


FIG.3

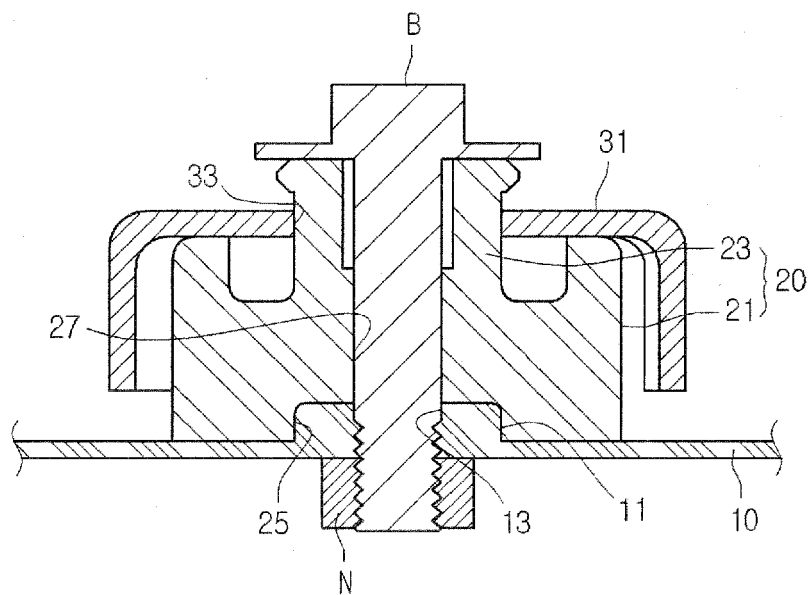


Fig. 4

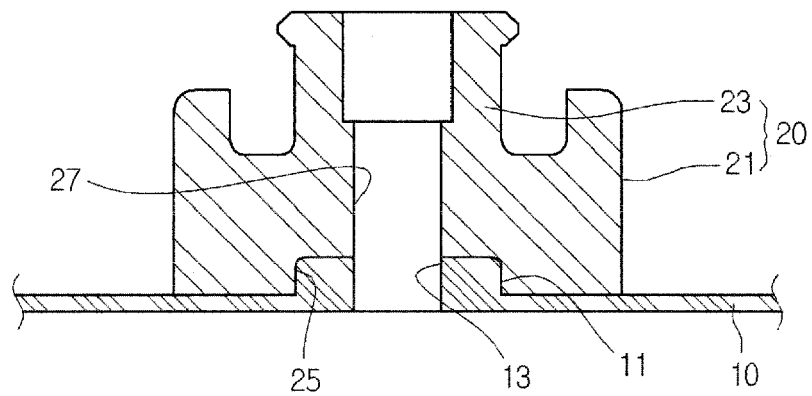


Fig. 5

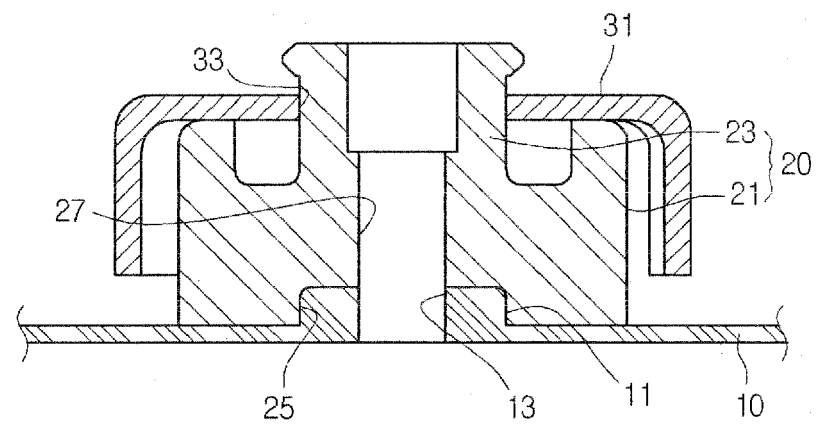


Fig. 6

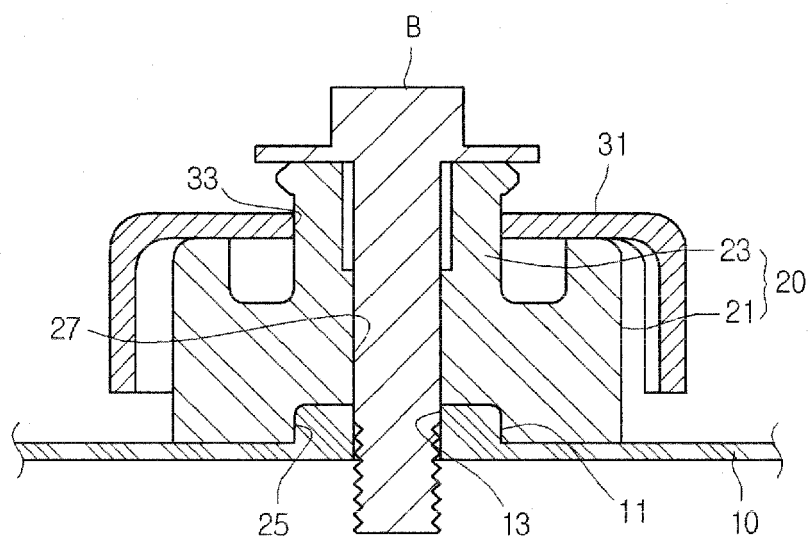


Fig. 7

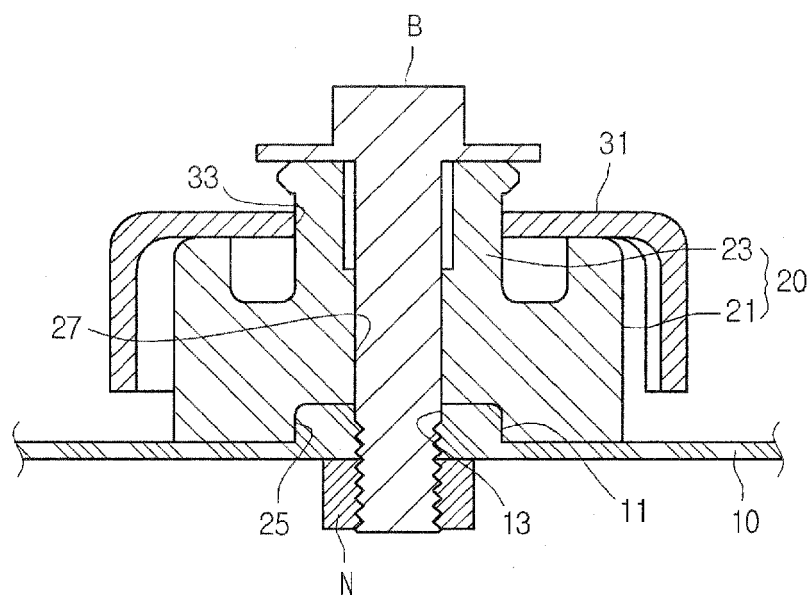


Fig. 8

