



Europäisches Patentamt
European Patent Office
Office européen des brevets



(11)

EP 1 321 674 A2

(12)

EUROPEAN PATENT APPLICATION

(43) Date of publication:
25.06.2003 Bulletin 2003/26

(51) Int Cl.7: **F04C 23/00**, F04C 18/02,
F04C 29/06

(21) Application number: **02022062.0**

(22) Date of filing: **02.10.2002**

(84) Designated Contracting States:
**AT BE BG CH CY CZ DE DK EE ES FI FR GB GR
IE IT LI LU MC NL PT SE SK TR**
Designated Extension States:
AL LT LV MK RO SI

(72) Inventor: **Song, Jin-Sub**
Gunpo, Gyeonggi-Do (KR)

(74) Representative: **Cohausz & Florack**
Patentanwälte
Kanzlerstrasse 8a
40472 Düsseldorf (DE)

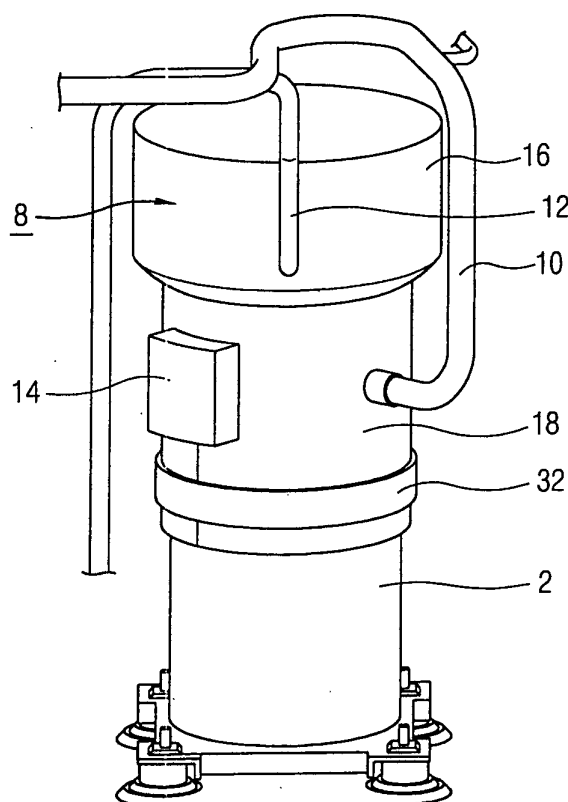
(30) Priority: **22.12.2001 KR 2001083266**

(71) Applicant: **LG ELECTRONICS INC.**
Seoul (KR)

(54) **Compressor with sound insulation case**

(57) A compressor with a sound insulation case includes: a casing with a closed space; a compressing unit inserted in an upper portion of the casing and performing a compressing operation; a driving unit inserted in a lower portion of the casing and generating a driving force required for the compressing operation of the compressor; and a sound insulation case mounted at an outer circumferential surface of an upper portion of the casing and preventing a noise generated from the compressing unit from leaking outwardly. A noise occurrence of equipment with a compressor installed therein is reduced by installing a sound insulation case outside a casing of the compressor and leakage of a noise generated from the compressor outwardly can be prevented.

FIG. 3



EP 1 321 674 A2

Description

BACKGROUND OF THE INVENTION

1. Field of the Invention

[0001] The present invention relates to a compressor for compressing a fluid, and more particularly, to a compressor with a sound insulation case that is capable of minimizing outward transmission of a noise generated from a compressor.

2. Description of the Background Art

[0002] In general, a compressor, which compresses a fluid to heighten a pressure of the fluid, is used for a freezing cycle of a refrigerator or an air-conditioner of home appliances.

[0003] Figure 1 is a perspective view showing an external appearance of a compressor and Figure 2 is a sectional view of the compressor in accordance with a conventional art.

[0004] A conventional compressor includes: a casing 106 with a suction pipe 102 for sucking a fluid and a discharge pipe 104 for discharging a compressed fluid which are connected to each other, and having a certain space therein; a driving unit 108 disposed at a lower portion of the casing 106 and generating a driving force; a compressing unit 110 disposed at an upper portion of the casing 106, connected to the driving unit 108 by a rotating shaft 112, and compressing the fluid sucked into the suction pipe 102 according to the rotation of the rotating shaft 112 and discharging it to the discharge pipe 104.

[0005] The casing 106 is formed in a closed cylindrical shape, and a terminal unit 116 for supplying power to the driving unit 108 is mounted at one side of the casing 106.

[0006] The driving unit 108 consists of a stator fixed in the circumferential direction of the casing 106 and a rotor 122 disposed at an inner circumferential surface of the stator 120 and fixed at the rotating shaft 1.12. When power is applied to the stator 120, the rotor 122 is rotated according to the interaction between the stator 120 and the rotor 122, and accordingly, the rotating shaft 112 is rotated.

[0007] The compressing unit 110 includes a fixed scroll 128 having an involute-shaped fixed vane 126, and being fixed at an inner side of the casing 106; and an orbiting scroll 132 having an involute-shaped orbiting vane 130 corresponding to the fixed vane 126 with a certain compression space 127 therebetween and making an orbiting movement when the rotating shaft 112 is rotated.

[0008] In the compressor constructed as described, when power is supplied to the driving unit 108, the rotating shaft 112 is rotated. Then, as the orbiting scroll 132 is accordingly orbited, a fluid sucked into the suction

pipe 102 owing to the interaction between the orbiting vane 130 and the fixed vane 126 and discharged outwardly through the discharge pipe 104.

[0009] However, the conventional compressor has a problem that, in compressing the fluid, a noise generated when the orbiting scroll 132 makes an orbiting movement for the fixed scroll 128 of the compressing unit inserted at the upper portion of the casing 105 is outwardly transmitted to make a bad influence on an operation environment.

SUMMARY OF THE INVENTION

[0010] Therefore, an object of the present invention is to provide a compressor with a sound insulation case that is capable of reducing a noise occurrence of equipment with a compressor installed therein by installing a sound insulation case outside a casing of the compressor and preventing an outward transmission of a noise generated from the compressor.

[0011] To achieve these and other advantages and in accordance with the purpose of the present invention, as embodied and broadly described herein, there is provided a compressor with a sound insulation case including: a casing with a closed space; a compressing unit inserted in an upper portion of the casing and performing a compressing operation; a driving unit inserted in a lower portion of the casing and generating a driving force required for the compressing operation of the compressor; and a sound insulation case mounted at an outer circumferential surface of an upper portion of the casing and preventing a noise generated from the compressing unit from leaking outwardly.

[0012] In the compressor with a sound insulation case of the present invention, the sound insulation case includes: a noise insulation portion mounted with a certain space at an outer circumferential surface of the upper portion of the casing in which the compressing unit is inserted, and blocking a noise generated from the compressing unit; and a mounting portion extended with a certain length downwardly of the noise insulation portion and hermetically mounted at an outer circumferential surface of the casing.

[0013] In the compressor with a sound insulation case of the present invention, the noise insulation portion is disposed with a certain space at an outer circumferential surface of an upper portion of the casing and formed in a cylindrical shape with an upper side closed, and a sound absorbing material for absorbing a noise generated from the compressing unit is attached at an inner circumferential surface of the casing.

[0014] In the compressor with a sound insulation case of the present invention, the mounting portion is integrally extended downwardly from the noise insulation portion, formed in a cylindrical shape and mounted at an outer circumferential surface of the casing, and includes a sealing portion formed at an inner circumferential surface thereof so as to be tightly attached on the outer

circumferential surface of the casing hermetically and a locking band mounted at an outer circumferential surface thereof for attaching the sealing portion to be hermetically attached at the outer circumferential surface of the casing.

[0015] In the compressor with a sound insulation case of the present invention, the mounting portion is formed to cover a portion of the casing so that a lower portion of the casing can be exposed for heat-sinking of the casing.

[0016] In the compressor with a sound insulation case of the present invention, the sealing portion is formed in a circumferential direction at an upper and lower inner circumferential surface of the mounting portion and includes first and second sealing portions tightly attached on the outer circumferential surface of the casing.

[0017] In the compressor with a sound insulation case of the present invention, the locking band is made of an elastic material with a certain elastic force.

[0018] In the compressor with a sound insulation case of the present invention, the mounting portion includes: an open cutting section formed cut with a certain length in the upward direction from the lower end so that the sound insulation case can be easily inserted into the casing.

[0019] The foregoing and other objects, features, aspects and advantages of the present invention will become more apparent from the following detailed description of the present invention when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0020] The accompanying drawings, which are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification, illustrate embodiments of the invention and together with the description serve to explain the principles of the invention.

[0021] In the drawings:

Figure 1 is a perspective view showing an external appearance of a compressor in accordance with a conventional art;

Figure 2 is a sectional view showing the compressor in accordance with the conventional art;

Figure 3 is a perspective view showing a compressor with a sound insulation case in accordance with a preferred embodiment of the present invention;

Figure 4 is a sectional view showing a state that the sound insulation case is mounted in the compressor in accordance with the preferred embodiment of the present invention; and

Figure 5 is a perspective view showing the sound insulation case in accordance with the preferred embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0022] Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in the accompanying drawings.

[0023] There may exist a plurality of embodiments of a compressor with a sound insulation case of the present invention, of which a preferred one will now be described

[0024] Figure 3 is a perspective view showing a compressor with a sound insulation case in accordance with a preferred embodiment of the present invention, and Figure 4 is a sectional view showing a state that the sound insulation case is mounted in the compressor in accordance with the preferred embodiment of the present invention.

[0025] The compressor of the present invention includes: a casing 2 with a certain closed space; a compressing unit 4 inserted in an upper portion of the casing 2 and performing a compressing operation on a fluid; a driving unit 6 inserted in a lower portion of the casing 2 and generating a driving force required for driving of the compressing unit 4; and a sound insulation case 8 mounted at an outer circumferential surface of an upper portion of the casing 2 and blocking a noise generated from the compressing unit 4 from transmitting outwardly.

[0026] The casing 2 is formed in a closed cylindrical shape. A suction pipe 10 for sucking a fluid is connected at one side of the casing 2 and a discharge pipe 12 for discharging outwardly a compressed fluid is connected at the other side of the casing 2. A terminal box 14 for supplying power source to the driving unit 6 is mounted at an outer circumferential surface of the casing 2.

[0027] As shown in Figure 5, the sound insulation case 8 includes: a noise insulation portion 16 coupled at an outer circumferential surface of an upper portion in which the compressing unit 4 of the casing 2 is inserted, with a space therebetween which can be hermetically sealed, and blocking a noise generated from the compressing unit 4; and a mounting portion 18 extended with a certain length downwardly from the noise insulation portion 16 and hermetically mounted at an outer circumferential surface of the casing 2.

[0028] The noise insulation portion 16 includes: a cover 20 formed in a cylindrical shape with an upper side closed with a certain space in a circumferential direction at an outer circumferential surface of the upper portion of the casing 2 in which the compressing unit 4 is installed; and a noise absorbing material 22 attached at an inner circumferential surface of the cover 20 and absorbing a noise generated from the compressing unit 4.

[0029] A discharge pipe through hole 26 is formed at one side of the noise insulation portion 16, into which the discharge pipe 12 for discharging a compressed fluid passes by being connected to the casing 2.

[0030] The noise absorbing material 22 may be made of any material if the material has an excellent noise ab-

sorbing capacity.

[0031] The mounting portion 18 is integrally extended downwardly from the cover 20 of the noise insulation portion and formed in a cylindrical shape covering with a certain length of the casing 2 so that the lower portion of the casing 2 can be exposed.

[0032] First and second sealing portions 28 and 30 are protruded with a certain width in a circumferential direction from the upper and lower inner circumferential surface of the mounting portion and hermetically attached on the outer circumferential surface of the casing 2, and a locking band 32 is wound on the outer circumferential surface of the mounting portion 18 so as to adhere the first and second sealing portions 28 and 30 on the outer circumferential surface of the casing 2.

[0033] An open cutting section 36 is formed cut with a certain length in an axial direction from the lower end of the mounting portion 8, to facilitate mounting of the sound insulation case 8 by being open when the sound insulation case 8 is inserted into the casing 2.

[0034] A terminal box cabinet 38 is formed at one side of the mounting portion 8 to receive the terminal box 14, and a through hole 42 is formed into which the suction pipe 10 for sucking a fluid into the compressor passes.

[0035] The locking band 32 is preferably made of an elastic material to allow an elastic force to facilitate attachment of the first and second sealing portions 28 and 30 on the outer circumferential surface of the casing 2. As the locking band, besides the elastic material, various types can be adopted such as a clamp, a cable tie or a magic tape.

[0036] An assembly process of the sound insulation case will now be described.

[0037] The sound insulation case 8 is inserted from the upper side to the lower side of the casing 2. At this time, the sound insulation case 8 is inserted in a state that the open cutting section 36 of the mounting portion 18 is opened, so as to facilitate insertion of the sound insulation case 8.

[0038] The suction pipe 10 passes the through hole 42 formed at the mounting portion 18, and the discharge pipe 12 passes the through hole 26 formed at the noise insulation portion 16.

[0039] In this state, the locking band 32 is mounted on the outer circumferential surface of the mounting portion 18 so that the first and second sealing portions 28 and 30 of the mounting portion 18 can be hermetically attached on the outer circumferential surface of the casing 2.

[0040] In this case, the mounting portion 18 is formed so long that the lower portion of the casing 2 is exposed with a certain length, so that heat generated when the compressor is driven can be discharged outwardly through the exposed portion of the casing 2.

[0041] As so far described, the compressor with the sound insulation case of the present invention has the following advantage.

[0042] That is, by installing the sound insulation case

8 is installed at an outer circumferential surface of the upper portion where the compressing unit 4 is inserted, a noise generated from the compressing unit 4 is blocked from transmitting outwardly. Thus, a noise of equipment in which the compressor is installed can be considerably reduced.

[0043] As the present invention may be embodied in several forms without departing from the spirit or essential characteristics thereof, it should also be understood that the above-described embodiments are not limited by any of the details of the foregoing description, unless otherwise specified, but rather should be construed broadly within its spirit and scope as defined in the appended claims, and therefore all changes and modifications that fall within the meets and bounds of the claims, or equivalence of such metes and bounds are therefore intended to be embraced by the appended claims.

20 Claims

1. A compressor with a sound insulation case comprising:

a casing with a closed space;
a compressing unit inserted in an upper portion of the casing and performing a compressing operation;
a driving unit inserted in a lower portion of the casing and generating a driving force required for the compressing operation of the compressor; and
a sound insulation case mounted at an outer circumferential surface of an upper portion of the casing and preventing a noise generated from the compressing unit from leaking outwardly.

2. The compressor of claim 1, wherein the sound insulation case comprises:

a noise insulation portion mounted with a certain space at an outer circumferential surface of the upper portion of the casing in which the compressing unit is inserted, and blocking a noise generated from the compressing unit; and
a mounting portion extended with a certain length downwardly of the noise insulation portion and hermetically mounted at an outer circumferential surface of the casing.

3. The compressor of claim 2, wherein the noise insulation portion is disposed with a certain space at an outer circumferential surface of an upper portion of the casing and formed in a cylindrical shape with an upper side closed, and a sound absorbing material for absorbing a noise generated from the compress-

ing unit is attached at an inner circumferential surface of the casing.

4. The compressor of claim 2, wherein the mounting portion is integrally extended downwardly from the noise insulation portion, formed in a cylindrical shape and mounted at an outer circumferential surface of the casing, and includes a sealing portion formed at an inner circumferential surface thereof so as to be tightly attached on the outer circumferential surface of the casing hermetically and a locking band mounted at an outer circumferential surface thereof for attaching the sealing portion to be hermetically attached at the outer circumferential surface of the casing.
5. The compressor of claim 4, wherein the mounting portion is formed to cover a portion of the casing so that a lower portion of the casing can be exposed for heat-sinking of the casing.
6. The compressor of claim 4, wherein the sealing portion is formed in a circumferential direction at an upper and lower inner circumferential surface of the mounting portion and includes first and second sealing portions tightly attached on the outer circumferential surface of the casing.
7. The compressor of claim 4, wherein the locking band is made of an elastic material with a certain elastic force.
8. The compressor of claim 4, wherein the mounting portion includes: an open cutting section formed cut with a certain length in the upward direction from the lower end so that the sound insulation case can be easily inserted into the casing.

40

45

50

55

FIG.1

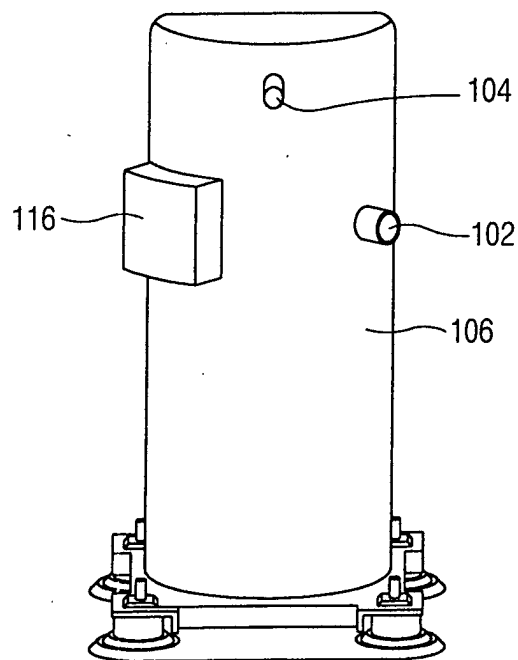


FIG.2

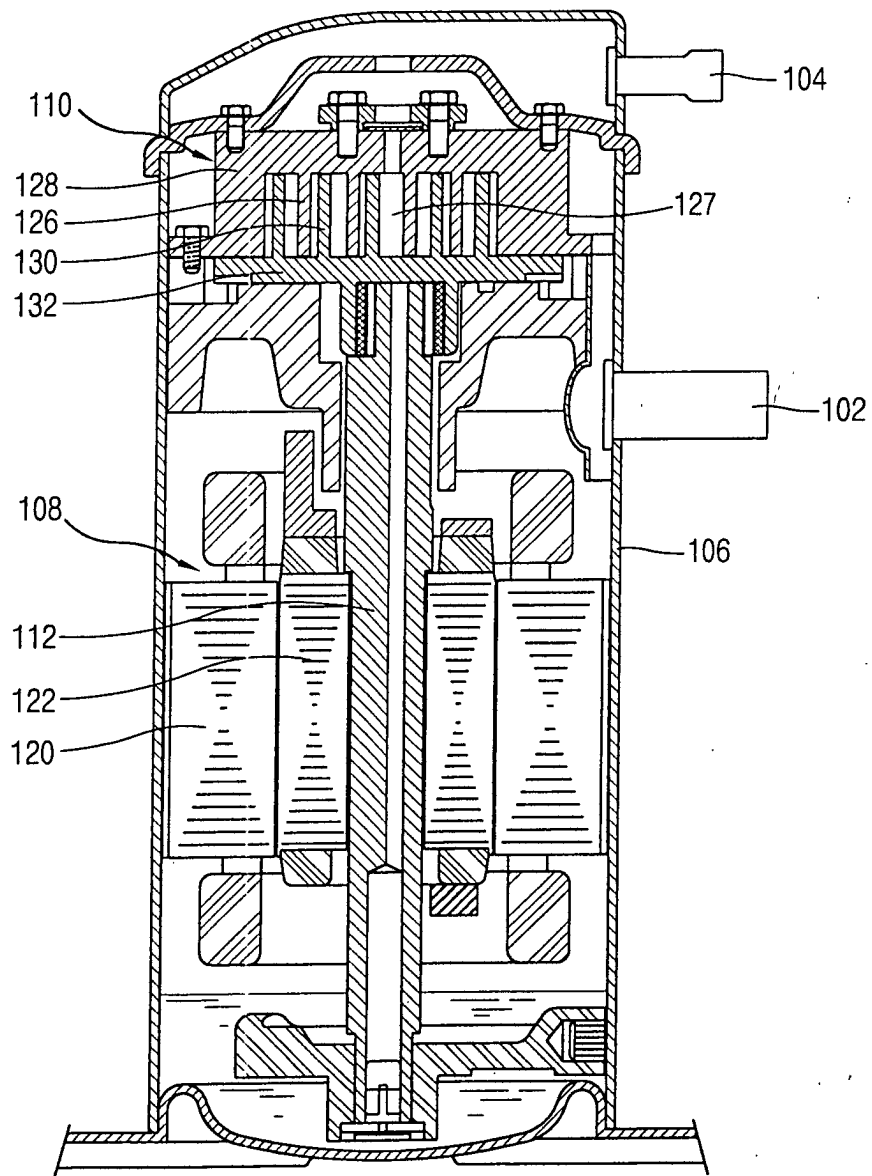


FIG.3

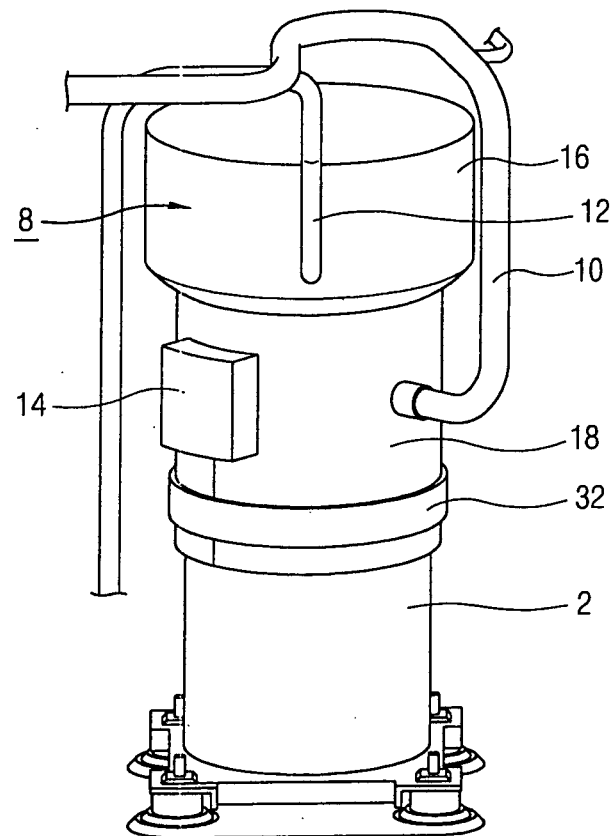


FIG. 4

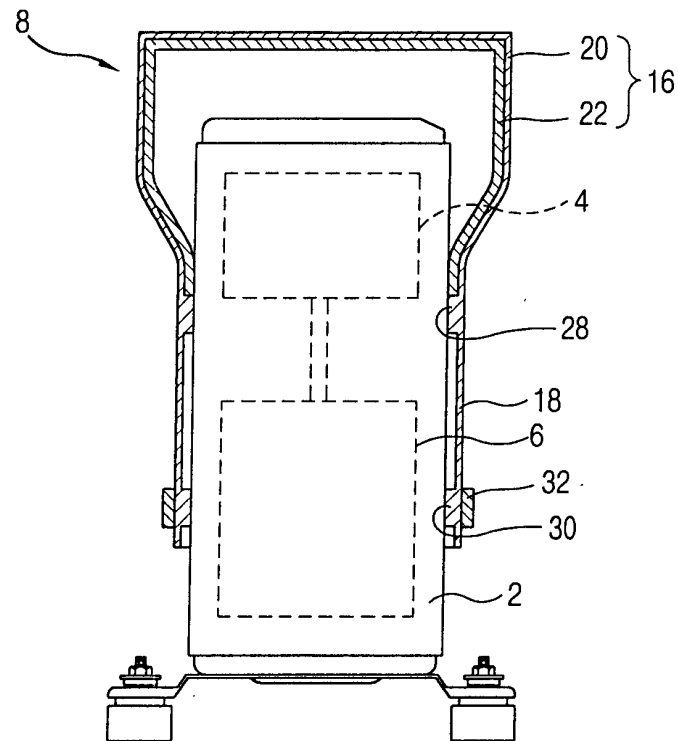


FIG. 5

