



(12) **EUROPEAN PATENT APPLICATION**

(43) Date of publication:
16.09.2015 Bulletin 2015/38

(51) Int Cl.:
F01C 21/10^(2006.01) F04C 18/356^(2006.01)

(21) Application number: **15158793.8**

(22) Date of filing: **12.03.2015**

(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
Designated Extension States:
BA ME
Designated Validation States:
MA

- **Miura, Shigeki**
Tokyo 108-8215 (JP)
- **Esaki, Ikuo**
Tokyo 108-8215 (JP)
- **Uno, Masanari**
Tokyo 108-8215 (JP)
- **Muroi, Yuichi**
Nagoya-Shi, Aichi 453-0862 (JP)

(30) Priority: **14.03.2014 JP 2014051615**

(74) Representative: **Intès, Didier Gérard André et al**
Cabinet Beau de Loménie
158, rue de l'Université
75340 Paris Cedex 07 (FR)

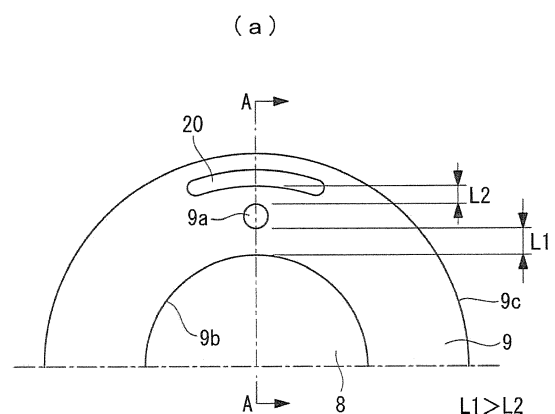
(71) Applicant: **MITSUBISHI HEAVY INDUSTRIES, LTD.**
Tokyo 108-8215 (JP)

(72) Inventors:
• **Ogawa, Makoto**
Tokyo 108-8215 (JP)

(54) **Rotary compressor**

(57) In this rotary compressor, a rotary compression mechanism driven through a crankshaft coupled with a drive source includes: a cylinder main body (9) forming a cylinder chamber (8); bearings installed respectively on upper and lower surfaces of the cylinder main body (9) and supporting the crankshaft; and a rotor fitted in an eccentric part of the crankshaft and rotating inside the cylinder chamber (8), at least the cylinder main body (9) and the bearings being integrated by fastening a bolt penetrating in the axial direction of the crankshaft. A deformation absorbing part such as a through-slit (20), which leads deformation during bolt fastening in at least one of the radially outward direction and the circumferential direction, is provided in a region around a bolt hole (9a) of the cylinder main body (9).

FIG. 1



Description

Technical Field

[0001] The present invention relates to a rotary compressor.

Background Art

[0002] Conventionally, a rotary compressor which includes a cylinder and a rotor that rotates inside the cylinder eccentrically to the axis of the cylinder is known as a compressor provided in a refrigeration cycle in an air conditioner, a chiller, etc. This rotary compressor sucks a low-pressure refrigerant, which circulates through a refrigerant circuit, into a cylinder chamber through a suction pipe connected to the side wall of the cylinder, and delivers a high-pressure refrigerant, which has been compressed inside the cylinder chamber by rotation of the rotor, through a discharge pipe to the outside of the compressor.

[0003] Such rotary compressors generally have a structure with members constituting a rotary compression mechanism, such as a cylinder main body, an upper bearing, a lower bearing, and a muffler forming a muffler chamber, fastened with a bolt. In a two-cylinder rotary compression mechanism, a separator plate which separates between the cylinders is also fastened with a bolt on the cylinder main body, etc.

[0004] In a rotary-type compressor disclosed in PTL 1 written below, a groove for alleviating distortion due to bolt fastening is provided at a position on an inner peripheral side (cylinder chamber side) relative to a bolt fastening part of the cylinder, namely, between the cylinder inner wall and the bolt hole.

{Citation List}

{Patent Literature}

{PTL 1}

[0005] Japanese Unexamined Patent Application, Publication No. S63-186988

Summary of Invention

Technical Problem

[0006] As described above, the conventional rotary compressor employs a structure with the members constituting the rotary compression mechanism, such as the cylinder main body, the bearings, and the muffler, laid on top of one another and integrated by fastening bolts. This raises a concern that deformation may occur in the cylinder bore due to bolt fastening.

[0007] Specifically, as shown in Fig. 7, when the bolt is screwed and fastened in a bolt hole 9a of a cylinder

main body 9 provided with an internal thread, in the cylinder main body 9, an inner wall surface 9b of a cylinder chamber 8 can deform so as to bulge out toward the inside (toward the center of the cylinder chamber) in the vicinity of the bolt fastening part. When such deformation occurs, the clearance (face-to-face distance) between the outer peripheral surface of a rotating rotor 12 and the inner wall surface 9b of the cylinder main body 9 forming the cylinder chamber 8 becomes the smallest in the region around the bolt hole 9a. In Fig. 7, the deformation due to bolt fastening is exaggerated for clear illustration of the deformation.

[0008] Therefore, in order that the rotor 12 does not come into contact with the inner wall surface 9b of the cylinder main body 9, the position of the rotational axial center of the rotor 12 is adjusted so as to secure a predetermined clearance set value g in the region around the bolt hole where the clearance becomes smallest. Specifically, the position of the rotational axial center of the rotor 12 is changed from C for a situation where there is no deformation to C'.

[0009] However, such adjustment of the clearance set value g involves increasing the clearance dimension in other regions which is apart from the bolt hole 9a in the circumferential direction. As a result, the amount of leakage of compressed fluid flowing out from the high-pressure side to the low-pressure side increases, which contributes to a decrease in compression efficiency of the rotary compressor. Thus, in a rotary compressor which employs bolt fastening for integrating the rotary compression mechanism, it is desirable to achieve higher efficiency by suppressing change in the inner diameter (deformation) in the cylinder bore due to bolt fastening and reducing the amount of leakage of a compressed fluid during compression.

[0010] In order to make an improvement in the above-described circumstances, the present invention aims to provide a rotary compressor which can achieve higher efficiency by suppressing change in the inner diameter in the cylinder bore due to bolt fastening and reducing the amount of leakage of a compressed fluid during compression.

Solution to Problem

[0011] In order to make an improvement in the above-described circumstances, the present invention has adopted the following solutions:

[0012] A rotary compressor according to a first aspect of the present invention is a rotary compressor comprising a rotary compression mechanism driven via a crankshaft coupled with a drive source, wherein the compression mechanism comprises: a cylinder main body forming a cylinder chamber; bearings installed respectively on upper and lower surfaces of the cylinder main body and supporting the crankshaft; and a rotor which is fitted to an eccentric part of the crankshaft and which rotates inside the cylinder chamber, wherein at least the cylinder

main body and the bearings are integrally assembled by fastening a bolt penetrating in the axial direction of the crankshaft, and wherein a deformation absorbing part is provided in a region around a bolt hole of the cylinder main body so that the deformation absorbing part leads deformation of the cylinder main body toward at least one of a radially outward direction and a circumferential direction during fastening the bolt.

[0013] According to such a rotary compressor, the deformation absorbing part which leads deformation due to bolt fastening toward at least one of the radially outward direction and the circumferential direction is provided in the region around the bolt hole of the cylinder main body. As a result, deformation of the cylinder main body due to bolt fastening is directed from the bolt fastening part toward the outer peripheral direction or the circumferential direction of the cylinder main body. It is therefore possible to prevent the inner wall surface of the cylinder chamber from bulging out toward the axial center of the cylinder main body and from reducing the cylinder bore during bolt fastening, or it is possible to suppress the bulging out and the bore reduction.

[0014] Specifically, the above-described deformation absorbing part is a region with a smaller rigidity, for example, by thinning the radial side of the cylinder main body, which is the outer peripheral side relative to the bolt fastening part such that deformation of the cylinder main body caused by bolt fastening is led in other directions than the direction toward the inside of the cylinder chamber.

[0015] In the above-described rotary compressor, it is preferable that the deformation absorbing part is a slit which is provided in a region other than a region positioned radially inward of the bolt hole and which is penetrating in the axial direction of the crankshaft. Accordingly, deformation of the cylinder main body due to bolt fastening is directed toward the outside in the radial direction relative to the bolt fastening part or in the circumferential direction throughout the cylinder main body in its thickness direction (axial direction). Therefore, deformation of the bore of the cylinder chamber bulging out toward the axial center of the cylinder main body can be prevented or suppressed throughout the cylinder main body in its thickness direction. Since such a through-slit also functions as a hollow heat-insulating layer, heat transmission from the outer periphery to the compression space can be suppressed.

[0016] In the above-described rotary compressor, the deformation absorbing part may be formed as a cutaway portion provided on an outer peripheral surface of the cylinder main body so as to penetrate the cylinder main body in the axial direction of the crankshaft. When such a cutaway portion is provided, the radial dimension of the cylinder main body becomes smaller on the outer peripheral side of the bolt fastening part throughout the cylinder main body in its thickness direction. Therefore, as deformation of the cylinder main body due to bolt fastening is directed toward the radially outside relative to the bolt

fastening part because of the fact that the rigidity of the radially outside is lower, deformation of the bore of the cylinder chamber, i.e., bulging out toward the axial center side can be prevented or suppressed throughout the cylinder main body in its thickness direction. Advantageous Effects of Invention

[0017] According to the rotary compressor of the present invention, since deformation of the cylinder main body caused by bolt fastening can be led in other directions than the radially inward direction, it is possible to prevent or suppress deformation of the inner wall of the cylinder chamber, i.e., bulging out toward the inside of the cylinder chamber. Thus, the clearance between the outer peripheral surface of the rotor and the inner wall surface of the cylinder main body forming the cylinder chamber can be uniformized to the predetermined clearance set value g (see Fig. 7) throughout the entire circumference. It is therefore possible to achieve higher efficiency by reducing the amount of leakage of compressed fluid flowing out from the high-pressure side to the low-pressure side during compression of the rotary compressor.

Brief Description of Drawings

[0018]

{Fig. 1}

Fig. 1 is a view showing a first embodiment of a rotary compressor according to the present invention, in which Fig. 1(a) is a plan view of a cylinder main body provided with a through-slit as a deformation absorbing part, and Fig. 1(b) is a cross-sectional view along the line A-A of Fig. 1(a).

{Fig. 2}

Fig. 2 is a plan view of the cylinder main body showing the through-slit shown in Fig. 1(a) after deformation.

{Fig. 3}

Fig. 3 is a plan view of the cylinder main body showing a first modified example of the through-slit shown in Fig. 1(a).

{Fig. 4}

Fig. 4 is a plan view of the cylinder main body showing a second modified example of the through-slit shown in Fig. 1(a).

{Fig. 5}

Fig. 5 is a view showing a second embodiment of the rotary compressor according to the present invention, and is a plan view of the cylinder main body provided with a thin-wall part as the deformation absorbing part.

{Fig. 6}

Fig. 6 is a longitudinal cross-sectional view showing a configuration example of an hermetic single-cylinder compressor as one example of the rotary compressor according to the present invention.

{Fig. 7}

Fig. 7 is a plan view showing a conventional structure of the cylinder main body.

Description of Embodiments

[0019] In the following, a first embodiment of a rotary compressor according to the present invention will be described based on the drawings.

[0020] Fig. 6 is a longitudinal cross-sectional view showing the configuration of an hermetic single-cylinder compressor as one example of a rotary compressor. For convenience, an embodiment applied to a single-cylinder rotary compressor will be described below. However, needless to say, the present invention is also applicable to a rotary compression mechanism in a two-cylinder rotary compressor as well as in a compressor having a number of different compression mechanisms.

[0021] An hermetic rotary compressor 1 has a housing 2 having an hermetic structure. This housing 2 is composed of a cylindrical center housing 2A, an upper housing 2B enclosing the upper part of the center housing 2A, and a lower housing 2C enclosing the lower part of the center housing 2A. An electric motor 4, which has a stator 5 and a rotor 6, is fixedly installed as a drive source on the upper side of the inside the center housing 2A.

[0022] The rotor 6 is integrally connected with a crankshaft (rotating shaft) 7.

[0023] As publicly known, this electric motor 4 has an axial offset between the stator 5 and the rotor 6, and by means of a force in the pulling direction of an axial magnet acting between the stator 5 and the rotor 6, this electric motor 4 has functions to pull the rotor 6 and the crankshaft 7 upward during stable operation. This function provides a thrust force reduction mechanism which reduces a thrust force acting between a thrust end surface formed in an eccentric part of the crankshaft 7 and end surfaces of an upper bearing 10 and a lower bearing 11, which will be described later.

[0024] A single-cylinder rotary compression mechanism 3 is installed under the electric motor 4. This rotary compression mechanism 3 includes the following elements: a cylinder main body 9 in which a cylinder chamber 8 is formed; the upper bearing 10 and the lower bearing 11 fixedly installed on the upper part and the lower part of the cylinder main body 9 and enclosing the upper part and the lower part of the cylinder chamber 8; a rotor 12 which is fitted to an eccentric part 7A of the crankshaft 7 and rotates along the inner peripheral surface of the cylinder chamber 8; and a blade and a blade holddown spring (which are not shown), which partition the inside of the cylinder chamber 8 into a suction side and a discharge side.

[0025] This rotary compression mechanism 3 is fixedly installed by making either the cylinder main body 9 or the upper bearing 10 plug-welded or fixed by caulking at a plurality of positions on the circumference in the inner peripheral surface of the center housing 2A, while other members are integrally assembled to the fixedly installed

member.

[0026] The rotary compression mechanism 3 suctions a low-pressure refrigerant gas, which is a fluid to be compressed, from an accumulator 14 provided integrally in the rotary compressor 1 through a suction pipe 13 and into the cylinder chamber 8, and after compressing this refrigerant gas through rotation of the rotor 12, discharges the refrigerant gas into an upper muffler chamber 15 and a lower muffler chamber 16 formed by the upper bearing 10 and the lower bearing 11. The high-pressure refrigerant gas thus compressed merges in the upper muffler chamber 15 before being discharged into the center housing 2A. There is substantially no pressure difference between the inside of the upper muffler chamber 15 and the lower muffler chamber 16 and the inside of the center housing 2A.

[0027] This high-pressure refrigerant gas flows through a gas passage hole (not shown) provided around the electric motor 4 and is guided to a space above the electric motor 4, and further is delivered through a discharge pipe 17 to the outside of the rotary compressor 1, namely, to the refrigeration cycle side.

[0028] In the above-described rotary compression mechanism 3, the cylinder main body 9, the upper bearing 10 and the lower bearing 11 disposed on the upper and lower sides of the cylinder main body 9, and a lower muffler 16A forming the lower muffler chamber 16 under the lower bearing 11 are integrally assembled through screw fastening of a bolt 18 which penetrates in the axial direction of the crankshaft 7.

[0029] The upper muffler chamber 15 and the lower muffler chamber 16 are parts which are both free of pressure difference between the inside thereof and the outside. In the configuration example shown in Fig. 6, since sealability against lubricant is required, the lower muffler 16A is fastened with the bolt 18. However, there is no particular limit for the structure of an upper muffler 15A and the lower muffler 16A, and therefore a structure with both mufflers fastened with the bolt 18, a structure with only either of the mufflers fastened with the bolt 18, etc. are possible.

First Embodiment

[0030] As described above, the rotary compressor 1 has the rotary compression mechanism 3 driven through the crankshaft 7 coupled with the electric motor 4 serving as a drive source includes the cylinder main body 9 forming the cylinder chamber 8, the upper bearing 10 and the lower bearing 11 installed on the upper and lower surfaces, respectively, of the cylinder main body 9 and supporting the crankshaft 7, and the rotor 12 fitted to the eccentric part 7A of the crankshaft 7 and rotating inside the cylinder chamber 8. In the compressor 1, at least the cylinder main body 9 and the upper bearing 10 and the lower bearing 11 are integrated by fastening the bolt 18 penetrating in the axial direction of the crankshaft 7. The compressor 1 includes, for example, as shown in Fig. 1,

a through-slit 20 as a deformation absorbing part provided in the region around a bolt hole 9a which is provided in the cylinder main body 9 and into which the bolt 18 is screwed and fastened.

[0031] This through-slit 20 forms a low-rigidity region such that deformation of the cylinder main body 9 due to the bolt 18 screwed into the bolt hole 9a of the cylinder main body 9 during fastening of the bolt 18 is led to at least one of the radially outward direction and the circumferential direction of the cylinder main body 9.

[0032] The through-slit 20 of the embodiment shown in Fig. 1 is an arc-shaped slit formed in the vicinity of the bolt hole 9a and at the outer peripheral side relative to the bolt hole 9a, and is provided so as to penetrate the cylinder main body 9 along its thickness t in the axial direction of the crankshaft 7. Around the bolt hole 9a, a dimension $L2$ on the radially outer peripheral side is set to be smaller than a dimension $L1$ on the inner peripheral side ($L2 < L1$).

[0033] Consequently, around the bolt hole 9a, the radially outer peripheral side, in which the dimension $L2$ is made smaller than the dimension $L1$, becomes lower in rigidity than the inner peripheral side, so that a low-rigidity region having a lower rigidity than the surrounding area is formed at the radially outer peripheral side of the bolt hole 9a.

[0034] In the rotary compressor 1 provided with such a through-slit 20, the area surrounding the bolt hole 9a of the cylinder main body 9 deforms by an input in the direction of enlarging the diameter of the bolt hole 9a, which occurs as the bolt 18 is screwed in and fastened. For example, as shown in Fig. 2, this deformation takes the form of bulging out to the inside of the through-slit 20 toward the radially outer peripheral side where the rigidity is low around the bolt hole 9a. In this case, too, the deformation due to bolt fastening is exaggerated for clear illustration of the deformation.

[0035] Thus, during fastening the bolt 18, deformation of the cylinder main body 9 is relieved toward the radially outer peripheral side of the bolt hole 9a and the input is absorbed, and then an inner wall surface 20a of the through-slit 20 on the cylinder chamber side deforms so as to bulge out toward the slit space 20b and form a bulge-out part 21. Accordingly, deformation in the direction of reducing the cylinder bore can be prevented or suppressed. In other words, in this embodiment, the through-slit 20, which serves as a relief of deformation caused by bolt fastening, is provided between the bolt hole 9a and the outer wall surface 9c of the cylinder main body 9 such that the outer peripheral side of the bolt hole 9a deforms preferentially. Thus, occurrence of deformation in the cylinder bore of the cylinder chamber 8 can be suppressed.

[0036] As a result, in the rotary compression mechanism 3, a predetermined clearance set value g can be secured along the entire circumference even when the position of the rotational axial center of the rotor 12 is positioned at C. Thus, the amount of leakage of com-

pressed fluid which leaks from the high-pressure side to the low-pressure side can be reduced.

[0037] Moreover, since the through-slit 20 is provided so as to penetrate in the axial direction of the crankshaft 7, deformation of the cylinder main body 9 due to bolt fastening is directed toward the radially outside from the bolt hole 9a throughout the thickness t . Therefore, deformation during bolt fastening which reduces the bore of the cylinder chamber 8 can be prevented or suppressed throughout the cylinder main body 9 in its thickness direction.

[0038] Furthermore, when such a through-slit 20 is provided, a hollow heat-insulating layer is formed on the outer peripheral side of the cylinder chamber 8, which can suppress transmission of heat input from the outer periphery, in which the temperature is higher, into the low-temperature cylinder chamber 8, and contribute to improve compression efficiency.

[0039] The above-described slit serving as the deformation absorbing part is not limited to the arc-shaped through-slit 20 shown in Fig. 1 and Fig. 2, but various modified examples described below are also possible.

[0040] In a first modified example shown in Fig. 3, a substantially semicircular through-slit 20A is formed on the radially outer peripheral side relative to the bolt hole 9a. This through-slit 20A forms a low-rigidity region surrounding a substantially semicircular region on the outer peripheral side relative to the bolt hole 9a, and not only absorbs deformation during bolt fastening toward the radially outer peripheral side but also absorbs deformation in the circumferential direction. Thus, with the embodiment described above, deformation of the cylinder bore of the cylinder chamber 8 can be suppressed.

[0041] In a second modified example shown in Fig. 4, each of the arc-shaped through-slits 20L, 20R is formed on each side of the bolt hole 9a so as to extend in the circumferential direction of the bolt hole 9a. These through-slits 20L, 20R form a low-rigidity region on each side of the bolt hole 9a in the circumferential direction, and thereby absorb deformation during bolt fastening mainly in the circumferential direction. Thus, with the embodiment and the first modified example described above, deformation of the cylinder bore of the cylinder chamber 8 can be suppressed.

Second Embodiment

[0042] In the embodiment described below, a cutaway part 30, which is formed, for example, as shown in Fig. 5, by providing a recessed groove part 9d of the outer peripheral surface of the cylinder main body 9 so as to penetrate in the axial direction of the crankshaft 7, serves as the deformation absorbing part. Parts that are the same as those of the above-described embodiment and its modified examples will be denoted by the same reference signs and a detailed description thereof will be omitted.

[0043] The recessed groove part 9d shown in Fig. 5 is

a groove having a substantially semicircular cross-section and extending in the thickness direction. The recessed groove part 9d is provided in an outer wall surface 9c of the cylinder main body 9 throughout the thickness t and positioned on a radial extension line passing through the centers of the cylinder chamber 8 and the bolt hole 9a. There is no particular limit for the cross-sectional shape of the recessed groove part 9d, and therefore it may have a rectangular cross-sectional shape or a triangular cross-sectional shape, for example.

[0044] When such a recessed groove part 9d is provided, the radial dimension of the cylinder main body 9 becomes smaller on the outer peripheral side of the bolt hole 9a, which is provided with the cutaway part 30, relative to the inner peripheral side, throughout the thickness of the cylinder main body 9. Specifically, the cutaway forming part 30, which is the outer peripheral side of the bolt hole 9a, becomes a low-rigidity region having a smaller radial dimension than the inner peripheral side of the bolt hole 9a. Accordingly, deformation of the cylinder main body 9 due to bolt fastening is directed toward the radially outside relative to the bolt hole 9a. As a result, deformation of the bore of the cylinder chamber 8 bulging out to the axial center side is prevented or suppressed throughout the thickness of the cylinder main body 9.

[0045] Formation of the low-rigidity region by means of such a recessed groove part 9c can be appropriately combined with the Through-slit 20 of the aforementioned embodiment or its modified examples described above.

[0046] Thus, according to this embodiment having been described, the deformation absorbing part is included which leads deformation of the cylinder main body 9 caused by fastening the bolt in other directions than the direction toward the inside of the cylinder chamber 8. Accordingly, deformation of the cylinder main body 9 due to bolt fastening is directed from the bolt hole 9a in the bolt fastening part toward the outer peripheral direction (radially outward direction) or the circumferential direction of the cylinder main body 9. Such a deformation absorbing part is a region in which the rigidity is reduced, for example, by reducing the dimension in the radial direction or the circumferential direction of the cylinder main body 9 (dimension in which the mass of the cylinder main body 9 exists) which is positioned at the outer peripheral side relative to the bolt hole 9a serving as the bolt fastening part. Thus, when the bolt is fastened during assembly of the rotary compression mechanism 3, deformation of the inner wall surface 9b of the cylinder chamber 8 bulging out to the axial center side and reducing the cylinder bore can be prevented or suppressed by guiding the deformation toward the low-rigidity side.

[0047] Accordingly, since the clearance between the outer peripheral surface of the rotor 12 and the inner wall surface 9b of the cylinder main body 9 forming the cylinder chamber 8 can be uniformized to the predetermined clearance set value g along the entire circumference, higher efficiency can be achieved by reducing the amount of leakage of the compressed fluid flowing out from the

high-pressure side to the low-pressure side during compression of the rotary compressor 1. Such an increase in efficiency of the rotary compressor 1 becomes more remarkable especially when a compressed fluid used at high pressure (e.g., an R32 refrigerant) is handled.

[0048] Compared with PTL 1 in which the slit is provided on the inner peripheral side relative to the bolt hole 9a, this embodiment, in which the deformation absorbing part is provided on the outer peripheral side, has also an advantage in which it is easy to reduce the size of the rotary compressor 1 or to secure favorable sealability.

[0049] The present invention is not limited to the above-described embodiments, but is also applicable, for example, to a rotary compression mechanism of a compressor having a rotary compression mechanism and a scroll compression mechanism in combination. Thus, changes can be made appropriately within the scope of the present invention.

Reference Signs List

[0050]

- 1 Rotary compressor
- 2 Housing
- 2A Center housing
- 3 Rotary compression mechanism
- 4 Electric motor
- 7 Crankshaft
- 7A Eccentric part
- 8 Cylinder chamber
- 9 Cylinder main body
- 9a Bolt hole
- 9b Inner wall surface
- 9c Outer wall surface
- 9d recessed groove part
- 10 Upper bearing
- 11 Lower bearing
- 12 Rotor
- 15 Upper muffler chamber
- 15A Upper muffler
- 16 Lower muffler chamber
- 16A Lower muffler
- 20, 20A, 20L, 20R Through-slit (deformation absorbing part)
- 21 Bulge-out part
- 30 Cutaway forming part (deformation absorbing part)

Claims

1. A rotary compressor (1) comprising a rotary compression mechanism (3) driven via a crankshaft (7) coupled with a drive source, wherein the compression mechanism comprises: a cylinder main body (9) forming a cylinder chamber (8); bearings (10, 11) installed respectively on upper and lower surfaces of

the cylinder main body and supporting the crankshaft; and a rotor (12) which is fitted to an eccentric part (7A) of the crankshaft and which rotates inside the cylinder chamber (8), wherein at least the cylinder main body (9) and the bearings (10,11) are integrally assembled by fastening a bolt (18) penetrating in the axial direction of the crankshaft (7), and wherein a deformation absorbing part (20;20A;20L,20R;30) is provided in a region around a bolt hole (9a) of the cylinder main body (9) so that the deformation absorbing part leads deformation of the cylinder main body toward at least one of a radially outward direction and a circumferential direction during fastening the bolt (18).

2. The rotary compressor according to claim 1, wherein the deformation absorbing part is a slit (20;20A;20L,20R) which is provided in a region other than a region positioned radially inward of the bolt hole (9a) and which is penetrating in the axial direction of the crankshaft (7).
3. The rotary compressor according to claim 1, wherein the deformation absorbing part is formed as a cutaway portion (30) provided on an outer peripheral surface of the cylinder main body (9) so as to penetrate the cylinder main body in the axial direction of the crankshaft (7).

FIG. 1

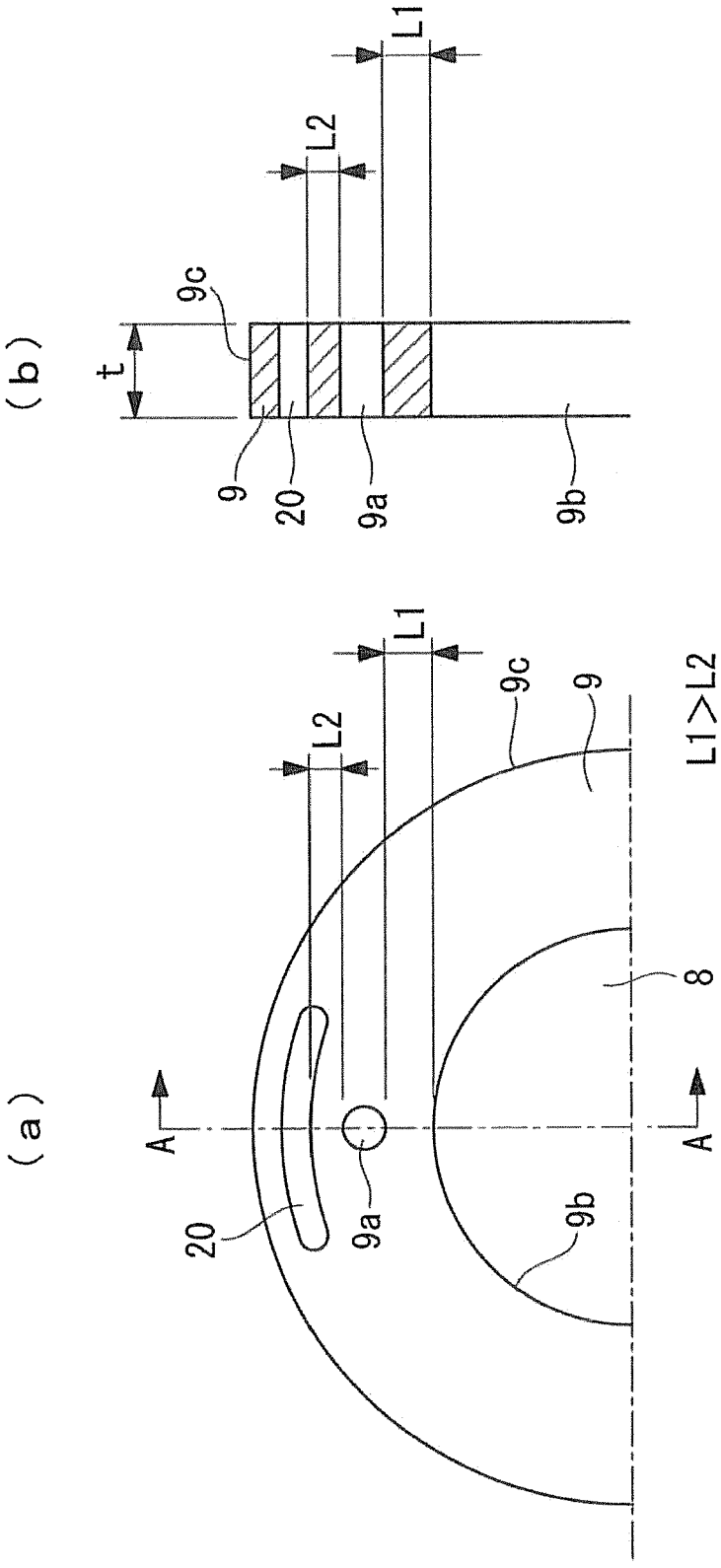


FIG. 2

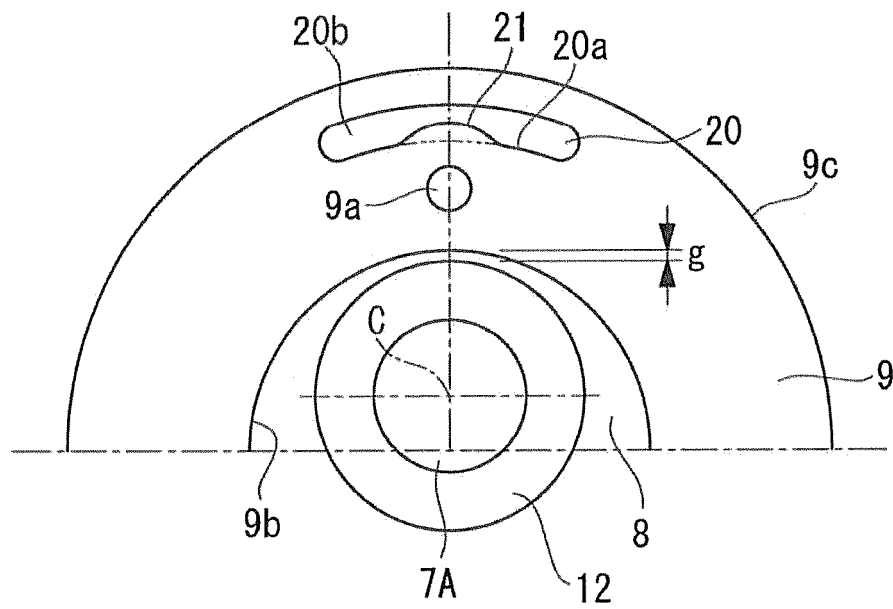


FIG. 3

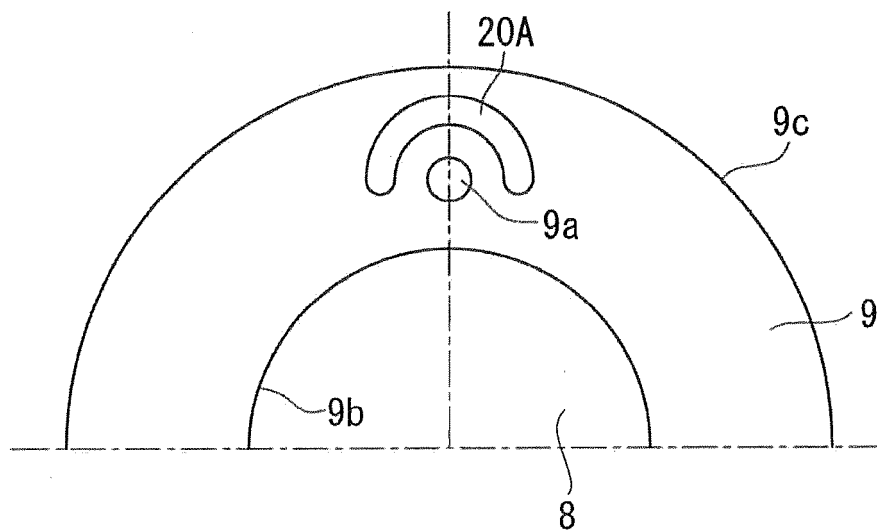


FIG. 4

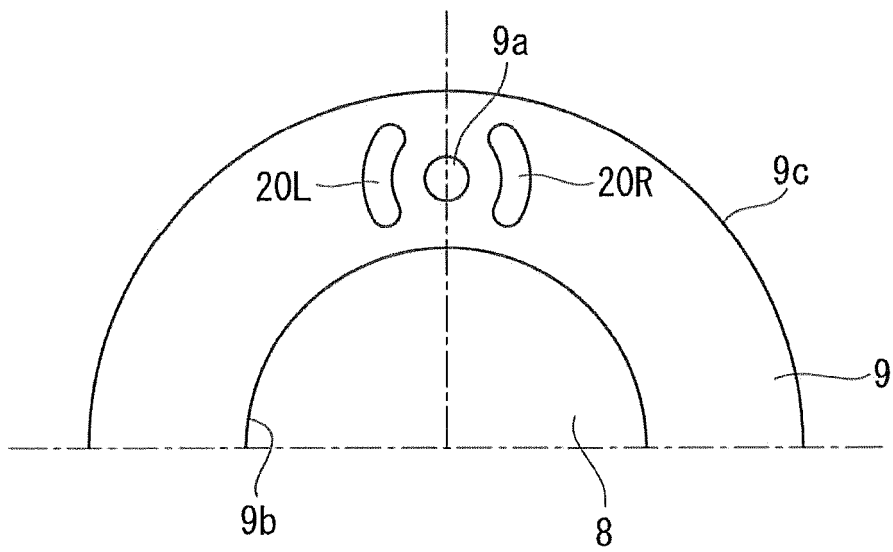


FIG. 5

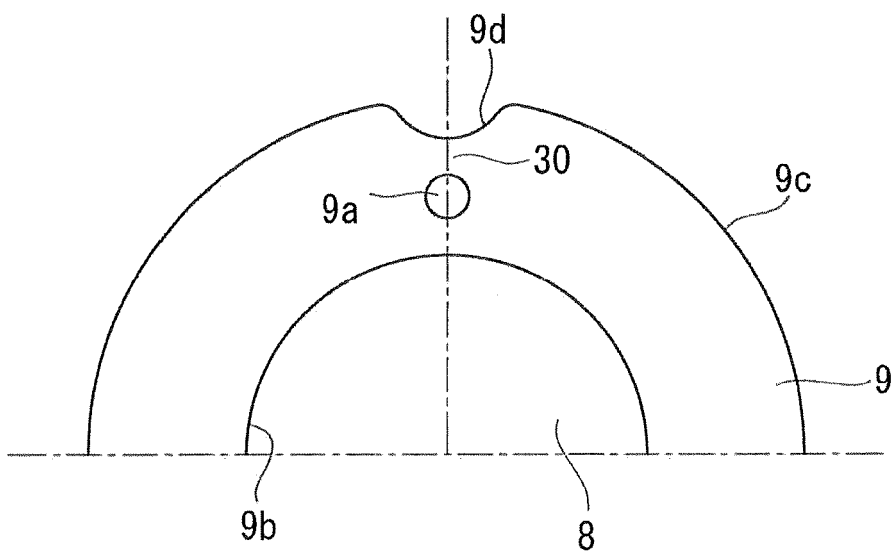


FIG. 6

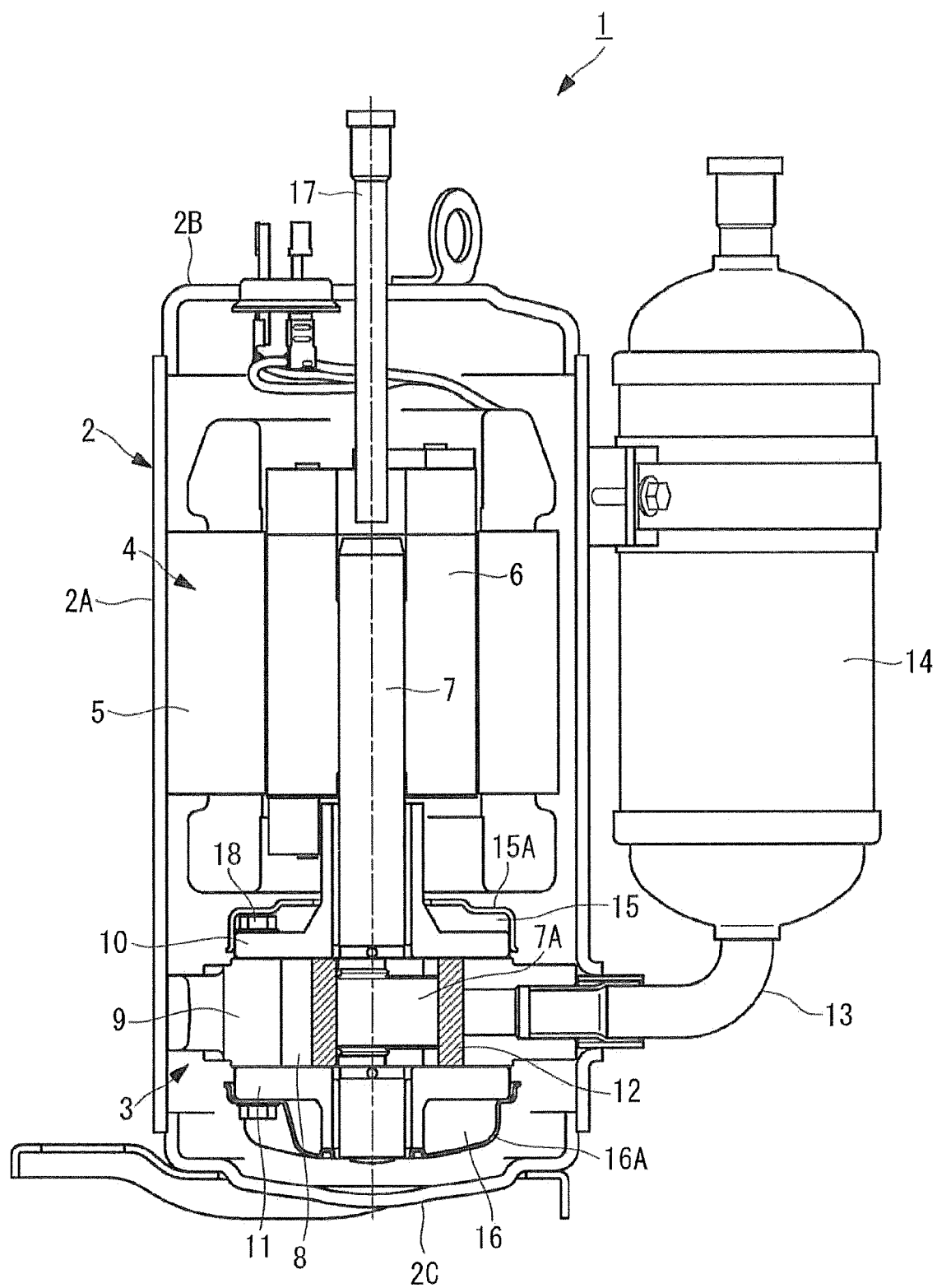
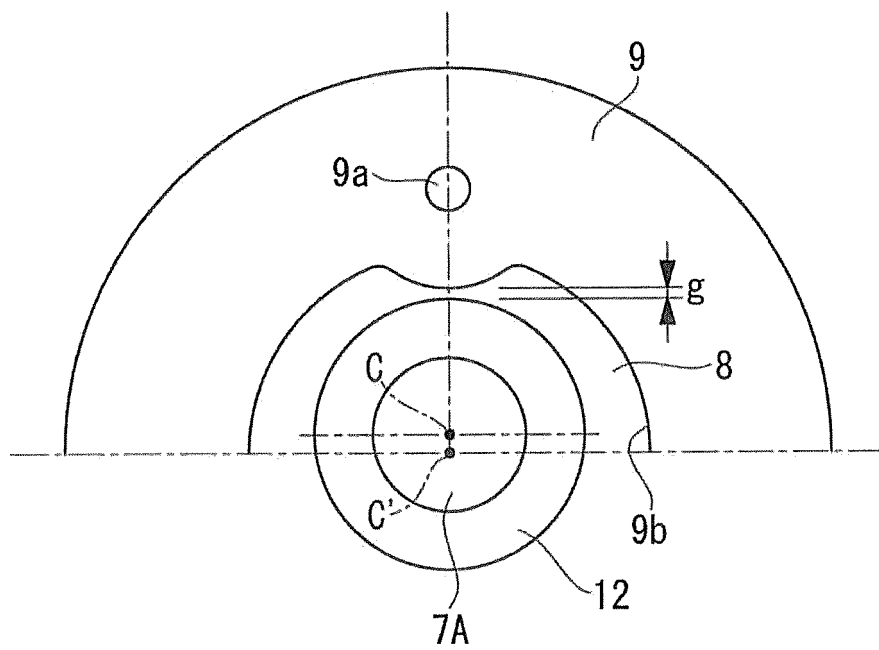


FIG. 7





EUROPEAN SEARCH REPORT

Application Number
EP 15 15 8793

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DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	JP H06 307363 A (HITACHI LTD) 1 November 1994 (1994-11-01)	1	INV. F01C21/10 F04C18/356
Y	* abstract * * figure 6 *	2,3	

X	JP S63 297791 A (MATSUSHITA ELECTRIC IND CO LTD) 5 December 1988 (1988-12-05)	1,2	
A	* abstract * * figures 2-5,7 *	3	

X	JP 2010 116782 A (DAIKIN IND LTD) 27 May 2010 (2010-05-27)	1	F01C F04C
A	* abstract * * figure 7 *	2,3	

Y	JP H11 324958 A (MATSUSHITA ELECTRIC IND CO LTD) 26 November 1999 (1999-11-26)	2,3	
	* abstract; figures 5,6 *		

Y	JP 2008 184903 A (MITSUBISHI HEAVY IND LTD) 14 August 2008 (2008-08-14)	2,3	
	* abstract * * figure 2 *		

The present search report has been drawn up for all claims			TECHNICAL FIELDS SEARCHED (IPC)
Place of search		Date of completion of the search	Examiner
Munich		15 July 2015	Sbresny, Heiko
CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

EPO FORM 1503 03.02 (P04C01)

**ANNEX TO THE EUROPEAN SEARCH REPORT
ON EUROPEAN PATENT APPLICATION NO.**

EP 15 15 8793

This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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15-07-2015

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
JP H06307363 A	01-11-1994	JP 3319026 B2 JP H06307363 A	26-08-2002 01-11-1994
JP S63297791 A	05-12-1988	JP H0633783 B2 JP S63297791 A	02-05-1994 05-12-1988
JP 2010116782 A	27-05-2010	NONE	
JP H11324958 A	26-11-1999	NONE	
JP 2008184903 A	14-08-2008	JP 5010295 B2 JP 2008184903 A	29-08-2012 14-08-2008

EPO FORM P0459

For more details about this annex : see Official Journal of the European Patent Office, No. 12/82

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- JP S63186988 B [0005]