(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 3 530 945 B1**

(12) **EUROPEAN PATENT SPECIFICATION**

(45) Date of publication and mention of the grant of the patent:
30.12.2020 Bulletin 2020/53

(21) Application number: **17874158.3**

(22) Date of filing: **22.11.2017**

(51) Int Cl.:
F04C 18/02 *(2006.01)* ***F01C 21/02*** *(2006.01)*
F04C 27/00 *(2006.01)*

(86) International application number:
PCT/JP2017/042070

(87) International publication number:
WO 2018/097199 (31.05.2018 Gazette 2018/22)

(54) DOUBLE ROTATING SCROLL TYPE COMPRESSOR

ROTIERENDER DOPPELSPIRALVERDICHTER

COMPRESSEUR À DOUBLE ROTATION DE TYPE À SPIRALE

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

(30) Priority: **24.11.2016 JP 2016227830**

(43) Date of publication of application:
28.08.2019 Bulletin 2019/35

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Description

[Technical Field]

[0001] The present invention relates to a co-rotating scroll compressor.

[Background Art]

[0002] Hitherto, a co-rotating scroll compressor is known (see PTL 1). The co-rotating scroll compressor includes a driving-side scroll and a driven-side scroll that rotates together with and in synchronization with the driving-side scroll. The co-rotating scroll compressor rotates the driving shaft and the driven shaft in the same direction at the same angular velocity by offsetting a driven shaft that supports the rotation of the driven-side scroll from a driving shaft that rotates the driving-side scroll by the turning radius. International application n° WO 86/01262 A1 discloses unloading of scroll compressors. Japanese patent n° JP 2865376 B2 discloses a scroll compressor. United States Patent n° 4,927,339 discloses a rotating scroll apparatus with axially based scroll members. Japanese Kokai n° JP H04 292591 A discloses a scroll compressor. German patent application n° DE 10031143 A1 discloses bearings for spiral rotary compressor with cooling air ducted over the bearings for long life operation.

[Citation List]

[Patent Literature]

[0003] [PTL 1]
the Publication of Japanese Patent No. 4556183

[Summary of Invention]

[Technical Problem]

[0004] In the scroll-type compressor as described above, a tip seal is generally provided between a spiral wall and an end plate opposed thereto in order to prevent the leakage of compressed fluid. In order to accommodate the tip seal, a tip seal groove is formed in the distal end of the spiral wall.

[0005] However, in order to process the tip seal groove in the distal end of the spiral wall, a predetermined processing accuracy is required, and there is also a problem in that the workload increases.

[0006] The present invention has been made in view of the situation as above, and an object thereof is to provide a co-rotating scroll compressor capable of omitting a process of processing a tip seal groove in a distal end of a wall.

[Solution to Problem]

[0007] In order to solve the abovementioned problems, a co-rotating scroll compressor of the present invention employs the following solutions.

[0008] That is, the co-rotating scroll compressor according to the present invention includes the features recited in claim 1.

[0009] The compressed space is formed when the driving-side wall arranged on the driving-side end plate of the driving-side scroll member and the driven-side wall of the driven-side scroll member are engaged with each other. The driving-side scroll member is driven by the drive unit so as to rotate, and the driving force transmitted to the driving-side scroll member is transmitted to the driven-side scroll member via the synchronous driving mechanism. As a result, the driven-side scroll member rotationally moves in the same direction at the same angular velocity as the driving-side scroll member while rotating. As described above, the double rotating-type scroll-type compressor in which both of the driving-side scroll member and the driven-side scroll member rotate is provided.

[0010] The biasing means for biasing the distal end of the driving-side wall and the distal end of the driven-side wall in a direction toward the driven-type end plate and the driving-side end plate that are opposed thereto is provided. As a result, a tip clearance that is the clearance between each of the distal ends of the walls and each of the end plates is reduced, and the leakage of the fluid from the compressed space can be reduced. As a result, the tip seals provided on the distal ends of the walls can be omitted. Accordingly, the tip seal grooves for arranging the tip seals do not need to be formed in the distal ends of the walls. Therefore, the processing of the tip seal groove becomes unnecessary, and hence the workload when the scroll member is manufactured can be reduced.

[0011] Note that synchronous driving mechanisms include a mechanism in which a pin and a ring are combined, an Oldham ring, and the like, for example.

[0012] Further, in an embodiment of the co-rotating scroll compressor of the present invention, the biasing means comprises an elastic member provided between a driven-side thrust bearing that receives thrust force of the driven-side scroll member and a housing that accommodates the driven-side scroll member.

[0013] The elastic member is provided between the driven-side thrust bearing that receives the thrust force of the driven-side scroll member and the housing that accommodates the driven-side scroll member. By the elastic member, the driven-side scroll member is biased to the driving-side scroll member side via the driven-side thrust bearing.

[0014] Elastic members include a coil spring, a ring spring, a corrugated plate spring, and the like, for example.

[0015] Further, in an embodiment the co-rotating scroll compressor of the present invention further includes a driven-side rolling bearing provided between a driven-side shaft portion connected to the driven-side end plate

and a housing that accommodates the driven-side scroll member, and the biasing means includes an elastic member provided between the driven-side rolling bearing and the housing.

[0016] The driven-side scroll member is rotatably supported by providing the driven-side rolling bearing between the driven-side shaft portion and the housing. Further, the elastic member is provided between the driven-side rolling bearing and the housing. By the elastic member, the driven-side scroll member is biased to the driving-side scroll member side via the driven-side rolling bearing.

[0017] Elastic members include a coil spring, a ring spring, a corrugated plate spring, and the like, for example.

[0018] Further, the co-rotating scroll compressor of the present invention further includes a displacement amount restricting means for restricting a displacement amount between the driving-side scroll member and the driven-side scroll member.

[0019] Biasing is performed by the biasing means in the direction in which the distance between the driving-side scroll member and the driven-side scroll member decreases. The displacement amount by the biasing force is restricted by the displacement amount restricting means. As a result, the tip clearance between the distal ends of the walls and the end plates that are opposed thereto can be managed to be a predetermined amount, and seizing and excessive wear between the distal ends of the walls and the end plates that are opposed thereto can be prevented.

[Advantageous Effects of Invention]

[0020] The biasing means for biasing the distal end of the driving-side wall and the distal end of the driven-side wall in a direction toward the driven-type end plate and the driving-side end plate that are opposed thereto is provided, and hence a configuration that omits the tip seal of the distal end of the wall can be employed, and the processing of the tip seal groove becomes unnecessary. Additionally, the displacement amount by the biasing force is restricted by the displacement amount restricting means.

[Brief Description of Drawings]

[0021]

[Fig. 1] Fig. 1 is a longitudinal cross-sectional view illustrating a co-rotating scroll compressor according to a first example not covered by the scope of the claims.

[Fig. 2] Fig. 2 is a plan view illustrating a driving-side scroll member in Fig. 1.

[Fig. 3] Fig. 3 is a plan view illustrating a driven-side scroll member in Fig. 1.

[Fig. 4] Fig. 4 is a longitudinal cross-sectional view illustrating a co-rotating scroll compressor according to a second example not covered by the scope of the claims.

[Fig. 5] Fig. 5 is a longitudinal cross-sectional view illustrating the region around a coil spring in Fig. 4 in an enlarged manner.

[Fig. 6] Fig. 6 is a longitudinal cross-sectional view illustrating a co-rotating scroll compressor according to a an embodiment of the present invention.

[Fig. 7] Fig. 7 is a longitudinal cross-sectional view illustrating the region around a stopper in Fig. 6 in an enlarged manner.

[Description of Embodiment and Examples]

[0022] Examples not covered by the scope of the claims and an embodiment according to the present invention are described below with reference to the drawings.

[First Example]

[0023] A first example not covered by the scope of the claims but useful for their understanding is described below with reference to Fig. 1 and the like.

[0024] Fig. 1 illustrates a co-rotating scroll compressor 1A. The co-rotating scroll compressor 1A can be used as a supercharger that compresses combustion air (fluid) to be supplied to an internal combustion engine such as a vehicle engine, a compressor for supplying compressed air to an air electrode of a fuel cell, or a compressor for supplying compressed air used in a braking device of a vehicle such as a train, for example.

[0025] The co-rotating scroll compressor 1A includes a housing 3, a motor (drive unit) 5 accommodated in one end side of the housing 3, and a driving-side scroll member 7 and a driven-side scroll member 9 accommodated in the other end side of the housing 3.

[0026] The housing 3 has a substantially cylindrical shape, and includes a motor accommodation portion 3a that accommodates the motor 5, and a scroll accommodation portion 3b that accommodates the scroll members 7 and 9.

[0027] Cooling fins 3c for cooling the motor 5 are provided on the outer periphery of the motor accommodation portion 3a. An exhaust opening 3d for exhausting air that has been compressed is formed in end portion of the scroll accommodation portion 3b. Note that, although not shown in Fig. 1, an air suction opening that sucks air is provided in the housing 3.

[0028] The motor 5 is driven by being supplied with electric power from a power supply source (not shown). The rotation control of the motor 5 is performed in accordance with instructions from a control unit (not shown). A stator 5a of the motor 5 is fixed to the inner peripheral side of the housing 3. A rotor 5b of the motor 5 rotates about a driving-side rotational axis CL1. A driving shaft 6 extending on the driving-side rotational axis

CL1 is connected to the rotor 5b. The driving shaft 6 is connected to the driving-side scroll member 7.

[0029] The driving-side scroll member 7 includes a driving-side end plate 7a, and a spiral driving-side wall 7b provided on one side of the driving-side end plate 7a. The driving-side end plate 7a is connected to the driving-side shaft portion 7c connected to a driving shaft 6, and extends in a direction orthogonal to the driving-side rotational axis CL1.

[0030] The tip seal is not provided on a distal end of the driving-side wall 7b in the height direction. Therefore, the distal end of the driving-side wall 7b has a flat surface because the tip seal groove is also not provided.

[0031] The driving-side shaft portion 7c is provided so as to be rotatable with respect to the housing 3 via a driving-side radial sliding bearing 11a. On the side of the driving-side radial sliding bearing 11a, a driving-side thrust sliding bearing 11b that receives thrust force by coming into contact with a place between the housing 3 and a shoulder portion of the driving-side shaft portion 7c is provided.

[0032] As illustrated in Fig. 2, the driving-side end plate 7a has a substantially disk-like shape when seen in planar view. The driving-side scroll member 7 includes three spiral driving-side walls 7b, that is, three lines of spiral driving-side walls 7b. The three lines of driving-side walls 7b are provided about the driving-side rotational axis CL1 at regular intervals. Radially outside end portions 7e of the driving-side walls 7b are not fixed to other wall portions and are independent. That is, wall portions that connect the radially outside end portions 7e to each other so as to provide reinforcement are not provided.

[0033] As illustrated in Fig. 1, the driven-side scroll member 9 is arranged so as to engage with the driving-side scroll member 7, and includes a driven-side end plate 9a and a spiral driven-side wall 9b arranged on one side of the driven-side end plate 9a.

[0034] The tip seal is not provided on a distal end of the driven-side wall 9b in the height direction. Therefore, the distal end of the driven-side wall 9b has a flat surface because the tip seal groove is also not provided.

[0035] A driven-side shaft portion 9c extending in the direction of a driven-side rotational axis CL2 is connected to the driven-side end plate 9a. The driven-side shaft portion 9c is provided so as to be rotatable with respect to the housing 3 via a driven-side radial sliding bearing 13a. On the side of the driven-side radial sliding bearing 13a, a driven-side thrust sliding bearing 13b that receives thrust force by coming into sliding contact with a place between the housing 3 and the driven-side end plate 9a is provided.

[0036] A coil spring (elastic member, biasing means) 14 is provided so as to abut against an end surface of the driven-side thrust sliding bearing 13b. A plurality of the coil springs 14 are provided in the circumferential direction about the driven-side axis CL2 at predetermined intervals. The coil springs 14 are stored in bottomed holes formed in the housing 3 toward the direction of the driven-side rotational axis CL2. The coil springs 14 are provided so as to bias the driven-side end plate 9a in the direction of the driving-side end plate 7a that is opposed thereto.

[0037] As illustrated in Fig. 3, the driven-side end plate 9a has a substantially disk-like shape when seen in planar view. Three spiral driven-side walls 9b, that is, three lines of spiral driven-side walls 9b are provided in the driven-side scroll member 9. The three lines of driven-side walls 9b are arranged about the driven-side rotational axis CL2 at regular intervals. An exhaust port 9d that exhausts air that has been compressed is formed in the driven-side end plate 9a on the substantially middle thereof. The exhaust port 9d is in communication with the exhaust opening 3d formed in the housing 3. The radially outside end portions 9e of the driven-side wall 9b are not fixed to other wall portions and are independent. That is, wall portions that connect the radially outside end portions 9e to each other so as to provide reinforcement are not provided.

[0038] As described above, as illustrated in Fig. 1, the driving-side scroll member 7 rotates about the driving-side rotational axis CL1 and the driven-side scroll member 9 rotates about the driven-side rotational axis CL2. The driving-side rotational axis CL1 and the driven-side rotational axis CL2 are offset from each other by a distance with which a compression chamber can be formed.

[0039] A plurality of pin ring mechanisms 15 are provided between the driving-side scroll member 7 and the driven-side scroll member 9. The pin ring mechanism 15 is used as a synchronous driving mechanism that transmits driving force from the driving-side scroll member 7 to the driven-side scroll member 9 so that both of the scroll members 7 and 9 rotationally move in the same direction at the same angular velocity. Specifically, as illustrated in Fig. 1, the pin ring mechanism 15 includes a ring member 15a that is a ball bearing, and a pin member 15b. The ring member 15a is fixed in a state in which an outer ring is fitted in a hole portion formed in the driving-side end plate 7a. The pin member 15b is fixed in a state of being inserted in a mounting hole formed in a distal end (the right end in Fig. 1) of the driven-side wall 9b. Note that, in Fig. 1, the state in which the pin member 15b is inserted in the distal end of the driven-side wall 9b is not clearly illustrated due to the position along which Fig. 1 is taken in the illustration, and only the pin member 15b is illustrated for the ease of understanding. When a side portion of a distal end of the pin member 15b moves while being in contact with an inner peripheral surface of an inner ring of the ring member 15a, rotationally moving in the same direction at the same angular velocity is realized.

[0040] The co-rotating scroll compressor 1A having the abovementioned configuration operates as follows.

[0041] When the driving shaft 6 is rotated about the driving-side rotational axis CL1 by the motor 5, the driving-side shaft portion 7c connected to the driving shaft 6 also rotates. As a result, the driving-side scroll member 7 rotates about the driving-side rotational axis CL1. When

the driving-side scroll member 7 rotates, the driving force is transmitted to the driven-side scroll member 9 via the pin ring mechanism 15, and the driven-side scroll member 9 rotates about the driven-side rotational axis CL2. At this time, the pin member 15b of the pin ring mechanism 15 moves while being in contact with the ring member 15a, and hence both of the scroll members 7 and 9 rotationally move in the same direction at the same angular velocity.

[0042] When both of the scroll members 7 and 9 rotationally and pivotally move, the air sucked from the suction opening in the housing 3 is sucked from the outer periphery side of both of the scroll members 7 and 9, and is taken into the compression chamber formed by both of the scroll members 7 and 9. The capacity of the compression chamber decreases as the compression chamber approaches the center side, and air is compressed accordingly. The air compressed as above flows through the exhaust port 9d in the driven-side scroll member 9 and is exhausted to the outside from the exhaust opening 3d in the housing 3.

[0043] The effects of this arrangement are as follows.

[0044] The driven-side wall 9b is biased by the coil springs 14 in the direction of the driven-side rotational axis CL2 via the driven-side thrust sliding bearing 13b. As a result, the driven-side scroll member 9 and the driving-side scroll member 7 are biased in directions in which the driven-side scroll member 9 and the driving-side scroll member 7 approach each other, the tip clearance between the distal end of the driven-side wall 9b and the driving-side end plate 7a and the tip clearance between the distal end of the driving-side wall 7b and the driven-side end plate 9a decrease, and the fluid leakage from the compressed space decreases.

[0045] Therefore, the tip seals provided on the distal ends of the walls 7b and 9b can be omitted. Accordingly, the tip seal grooves for arranging the tip seals do not need to be formed in the distal ends of the walls 7b and 9b. Therefore, the processing of the tip seal groove becomes unnecessary, and hence the workload when the scroll member is manufactured can be reduced.

[Second Example]

[0046] Next, a second example not covered by the scope of the claims but useful for their understanding is described with reference to Fig. 4 and the like. The sliding bearings 11a, 11b, 13a, and 13b are used as the bearings of the driving-side scroll member 7 and the driven-side scroll member 9 in the first example, but this example is different in that a ball bearing (rolling bearing) is used. Other configurations are similar. Therefore, similar configurations are denoted by the same reference characters and description thereof is omitted.

[0047] As illustrated in Fig. 4, in a co-rotating scroll compressor 1B according to this example, the driving-side shaft portion 7c of the driving-side scroll member 7 is rotatably supported by a driving-side ball bearing 17.

[0048] As illustrated in Fig. 4 and Fig. 5, the driven-side shaft portion 9c of the driven-side scroll member 9 is provided so as to be rotatable with respect to the housing 3 via a driven-side ball bearing 18 formed as a double row angular ball bearing.

[0049] A plurality of coil springs 20 (elastic members, biasing means) are provided so as to press the exhaust opening 3d side and the outer ring side (stationary side) of the driven-side ball bearing 18 formed to have a double row. The plurality of coil springs 20 are provided in the circumferential direction about the driven-side axis CL2 at predetermined intervals. The coil springs 20 are stored in bottomed holes formed in the housing 3 toward the direction of the driven-side rotational axis CL2. The coil springs 20 are provided so as to bias the driven-side end plate 9a in the direction of the driving-side end plate 7a that is opposed thereto. That is, the biasing force from the coil spring 20 is transmitted from the outer ring of a ball bearing 18a on the exhaust opening 3d side to the outer ring of a ball bearing 18b on the driven-side end plate 9a side, and is transmitted to the driven-side end plate 9a via the ball and the inner ring of the ball bearing 18b on the driven-side end plate 9a side. As described above, a back-to-back (DB combination) configuration in which a line connecting the contact points with respect to the driven-side rotational axis CL2 is longer than the distance between the bearings is obtained. As described above, a structure in which the entire driven-side ball bearing 19 moves in the thrust direction is obtained. Meanwhile, a mechanism that causes the internal clearance to be 0 (zero) with an angular bearing that is generally a preload mechanism does not have a structure in which the entire bearing moves.

[0050] The effects of this arrangement are as follows.

[0051] The driven-side wall 9b is biased by the coil springs 20 in the direction of the driven-side rotational axis CL2 via the driven-side ball bearing 18. As a result, the driven-side scroll member 9 and the driving-side scroll member 7 are biased in directions in which the driven-side scroll member 9 and the driving-side scroll member 7 approach each other, the tip clearance between the distal end of the driven-side wall 9b and the driving-side end plate 7a and the tip clearance between the distal end of the driving-side wall 7b and the driven-side end plate 9a decrease, and the fluid leakage from the compressed space decreases.

[0052] Therefore, the tip seals provided on the distal ends of the walls 7b and 9b can be omitted. Accordingly, the tip seal grooves for arranging the tip seals do not need to be formed in the distal ends of the walls 7b and 9b. Therefore, the processing of the tip seal groove becomes unnecessary, and hence the workload when the scroll member is manufactured can be reduced.

[0053] In addition, the coil springs 20 are formed so as to press the outer ring of the ball bearing 18a on the exhaust opening 3d side, and can press the stationary outer ring with respect to the housing 3. Therefore, there is no fear of wear and seizing of the coil spring 20.

[Embodiment of the claimed invention]

[0054] Next, an embodiment of the present invention is described with reference to Fig. 6 and the like. This embodiment is different from the second example in that a stopper that restricts the displacement amount of the driven-side ball bearing 18 is provided. Other configurations are similar to that of the second example Therefore, similar configurations are denoted by the same reference characters and description thereof is omitted.

[0055] As illustrated in Fig. 6 and Fig. 7, in a co-rotating scroll compressor 1C according to this embodiment, a stopper (displacement amount restricting means) 22 is provided on the side of the ball bearing 18b on the driven-side end plate 9a side. The stopper 22 is a plate-like body having a predetermined thickness, and is fixed to the housing 3 side via a bolt 23. Note that a shim having a predetermined thickness may be inserted between the stopper 22 and the housing 3. As a result, the distance between the stopper 22 and the ball bearing 18b on the driven end plate 9a side can be adjusted.

[0056] This embodiment has the following effects in addition to the effects of the second example.

[0057] Biasing is performed by the coil springs 20 in a direction in which the distance between the driving-side scroll member 7 and the driven-side scroll member 9 decreases. The displacement amount by the biasing force is restricted by the stopper 22. As a result, the tip clearance between the distal ends of the walls 7b and 9b and the end plates 7a and 9a that are opposed thereto can be managed to be a predetermined amount, and seizing and excessive wear between the distal ends of the walls and the end plates that are opposed thereto can be prevented.

[0058] Note that the coil spring is used as a member that biases the driven-side scroll member 9 in the above-mentioned embodiment and examples, but the present invention is not limited thereto, and a ring spring or a corrugated plate spring may be used, for example.

[Reference Signs List]

[0059]

1A, 1B, 1C	co-rotating scroll compressor
3	housing
3a	motor accommodation portion
3b	scroll accommodation portion
3c	cooling fin
3d	exhaust opening
5	motor (drive unit)
5a	stator
5b	rotor
6	driving shaft
7	driving-side scroll member
7a	driving-side end plate
7b	driving-side wall
7c	driving-side shaft portion
7e	radially outside end portion
9	driven-side scroll member
9a	driven-side end plate
9b	driven-side wall
9c	driven-side shaft portion
9d	exhaust port
9e	radially outside end portion
11a	driving-side radial sliding bearing
11b	driving-side thrust sliding bearing
13a	driven-side radial sliding bearing
13b	driven-side thrust sliding bearing
14	coil spring (elastic member, biasing means)
15	pin ring mechanism (synchronous driving mechanism)
15a	ring member
15b	pin member
17	driving-side ball bearing (rolling bearing)
18	driven-side ball bearing (rolling bearing)
18a	ball bearing on exhaust opening side
18b	ball bearing on driven-side end plate side
20	coil spring (elastic member, biasing means)
22	stopper (displacement amount restricting means)
23	bolt
CL1	driving-side rotational axis
CL2	driven-side rotational axis

Claims

1. A co-rotating scroll compressor (1A, 1B, 1C), comprising:

a driving-side scroll member (7) driven by a drive unit (5) so as to rotate, and comprising a spiral driving-side wall (7b) arranged on a driving-side end plate (7a);

a driven-side scroll member (9) in which a spiral driven-side wall (9b) corresponding to the driving-side wall (7b) is arranged on a driven-side end plate (9a), the driven-side wall (9b) being engaged with the driving-side wall (7b) so as to form a compression space;

a synchronous driving mechanism (15) that transmits driving force from the driving-side scroll member (7) to the driven-side scroll member (9) so that the driving-side scroll member (7) and the driven-side scroll member (9) rotationally move in a same direction at a same angular velocity;

a biasing means (14, 20) for biasing a distal end of the driving-side wall (7b) and a distal end of the driven-side wall (9b) in a direction toward the driven-side end plate (9a) and the driving-side end plate (7a) that are respectively opposed to the distal end of the driving-side wall (7b) and

the distal end of the driven-side wall (9b),and **characterized in that** it further comprises
a displacement amount restricting means (22) for restricting a displacement amount between the driving-side scroll member (7) and the driven-side scroll member (9), wherein the displacement amount restricting means (22) is fixed via a bolt to a side of a housing (3) that accommodates the driven-side scroll member (9).

2. The co-rotating scroll compressor (1A, 1B, 1C) according to claim 1, wherein the biasing means (14, 20) comprises an elastic member that abuts against a bearing (13b, 18) provided with respect to the driven-side scroll member (9).

3. The co-rotating scroll compressor (1A, 1B, 1C) according to claim 2, wherein the biasing means (14) comprises an elastic member provided between a driven-side thrust bearing (13b) that receives thrust force of the driven-side scroll member (9) and the housing (3).

4. The co-rotating scroll compressor (1A, 1B, 1C) according to claim 2, further comprising a driven-side rolling bearing (18) provided between a driven-side shaft portion (9c) connected to the driven-side end plate (9a) and the housing (3), wherein the biasing means (20) comprises an elastic member provided between the driven-side rolling bearing (18) and the housing (3).

Patentansprüche

1. Gleichläufiger Scrollverdichter (1A, 1B, 1C), der Folgendes umfasst:

ein antriebsseitiges Scrollelement (7), das von einer Antriebseinheit (5) angetrieben wird, um sich zu drehen, und eine antriebsseitige Spiralwand (7b) umfasst, die auf einer antriebsseitigen Endplatte (7a) bereitgestellt ist;
ein abtriebsseitiges Scrollelement (9), bei dem eine abtriebsseitige Spiralwand (9b), die der antriebsseitigen Wand (7b) entspricht, auf einer abtriebsseitigen Endplatte (9a) angeordnet ist, wobei die abtriebsseitige Wand (9b) in die antriebsseitige Wand (7b) eingerückt ist, um einen Verdichtungsraum zu bilden;
einen Synchronantriebsmechanismus (15), der vom antriebsseitigen Scrollelement (7) eine Antriebskraft auf das abtriebsseitige Scrollelement (9) überträgt, derart, dass sich das antriebsseitige Scrollelement (7) und das abtriebsseitige Scrollelement (9) mit einer selben Winkelgeschwindigkeit drehend in eine selbe Richtung bewegen;
ein Vorspannmittel (14, 20) zum Vorspannen eines distalen Endes der antriebsseitigen Wand (7b) und eines distalen Endes der abtriebsseitigen Wand (9b) in eine Richtung zur abtriebsseitigen Endplatte (9a) und zur antriebsseitigen Endplatte (7a), die dem distalen Ende der antriebsseitigen Wand (7b) bzw. dem distalen Ende der abtriebsseitigen Wand (9b) gegenüberliegen, und **dadurch gekennzeichnet, dass** er ferner Folgendes umfasst
ein Versatzbetragseinschränkungsmittel (22) zum Einschränken eines Versatzbetrags zwischen dem antriebsseitigen Scrollelement (7) und dem abtriebsseitigen Scrollelement (9), wobei das Versatzbetragseinschränkungsmittel (22) via einen Bolzen an einer Seite eines Gehäuses (3), in das das abtriebsseitige Scrollelement (9) aufgenommen ist, befestigt ist.

2. Gleichläufiger Scrollverdichter (1A, 1B, 1C) nach Anspruch 1, wobei das Vorspannmittel (14, 20) ein elastisches Element umfasst, das an einem Lager (13b, 18) anliegt, das mit Bezug auf das abtriebsseitige Scrollelement (9) bereitgestellt ist.

3. Gleichläufiger Scrollverdichter (1A, 1B, 1C) nach Anspruch 2, wobei das Vorspannmittel (14) ein elastisches Element umfasst, das zwischen einem antriebsseitigen Drucklager (13b), das eine Druckkraft des abtriebsseitigen Scrollelements (9) empfängt, und dem Gehäuse (3) bereitgestellt ist.

4. Gleichläufiger Scrollverdichter (1A, 1B, 1C) nach Anspruch 2, das ferner ein abtriebsseitiges Wälzlager (18) umfasst, das zwischen einem antriebsseitigen Wellenabschnitt (9c), der mit der abtriebsseitigen Endplatte (9a) verbunden ist, und dem Gehäuse (3) bereitgestellt ist, wobei das Vorspannmittel (20) ein elastisches Element umfasst, das zwischen dem antriebsseitigen Wälzlager (18) und dem Gehäuse (3) bereitgestellt ist.

Revendications

1. Compresseur à spirales corotatives (1A, 1B, 1C) comprenant :

un élément de spirale du côté de l'entraînement (7) entraîné par une unité d'entraînement (5) afin de tourner, et comprenant une paroi de spirale du côté de l'entraînement (7b) agencée sur une plaque d'extrémité du côté de l'entraînement (7a) ;
un élément de spirale du côté entraîné (9) dans lequel une paroi de spirale du côté entraîné (9b) correspondant à la paroi du côté de l'entraînement (7b) est agencée sur une plaque d'extré-

mité du côté entraîné (9a), la paroi du côté entraîné (9b) étant en prise avec la paroi du côté de l'entraînement (7b) afin de former un espace de compression ;
un mécanisme d'entraînement synchrone (15) qui transmet la force d'entraînement de l'élément de spirale du côté de l'entraînement (7) à l'élément de spirale du côté entraîné (9) de sorte que l'élément de spirale du côté de l'entraînement (7) et l'élément de spirale du côté entraîné (9) se déplacent, en rotation, dans une même direction à une même vitesse angulaire ;
un élément de sollicitation (14, 20) pour solliciter une extrémité distale de la paroi du côté de l'entraînement (7b) et une extrémité distale de la paroi du côté entraîné (9b) dans une direction vers la plaque d'extrémité du côté entraîné (9a) et la plaque d'extrémité du côté de l'entraînement (7a) qui sont opposées, respectivement, à l'extrémité distale de la paroi du côté de l'entraînement (7b) et l'extrémité distale de la paroi du côté entraîné (9b), et **caractérisé en ce qu'**il comprend en outre :

un moyen de limitation de quantité de déplacement (22) pour limiter une quantité de déplacement entre l'élément de spirale du côté de l'entraînement (7) et l'élément de spirale du côté entraîné (9),
dans lequel le moyen de limitation de quantité de déplacement (22) est fixé, via un boulon, à un côté d'un boîtier (3) qui loge l'élément de spirale du côté entraîné (9).

2. Compresseur à spirales corotatives (1A, 1B, 1C) selon la revendication 1, dans lequel le moyen de sollicitation (14, 20) comprend un élément élastique qui vient en butée contre un palier (13b, 18) prévu par rapport à l'élément de spirale du côté entraîné (9).

3. Compresseur à spirales corotatives (1A, 1B, 1C) selon la revendication 2, dans lequel le moyen de sollicitation (14) comprend un élément élastique prévu entre un palier de butée du côté entraîné (13b) qui reçoit la force de poussée de l'élément de spirale du côté entraîné (9) et le boîtier (3).

4. Compresseur à spirales corotatives (1A, 1B, 1C) selon la revendication 2, comprenant en outre un roulement du côté entraîné (18) prévu entre la partie d'arbre du côté entraîné (9c) raccordée à la plaque d'extrémité du côté entraîné (9a) et le boîtier (3), dans lequel le moyen de sollicitation (20) comprend un élément élastique prévu entre le roulement du côté entraîné (18) et le boîtier (3).

FIG. 1

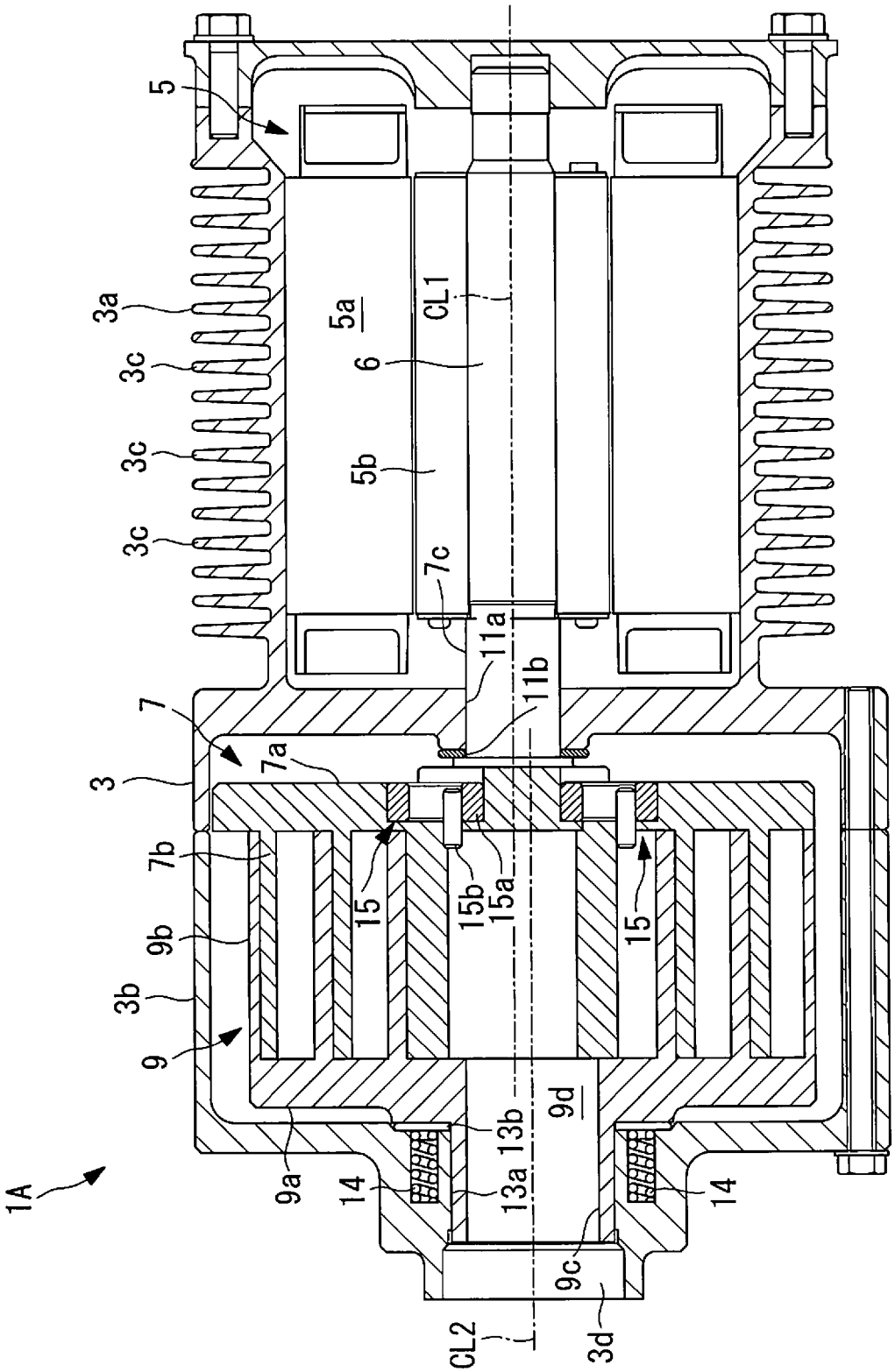

1A
3
3a
3b
3c
3c
3c
3d
5
5a
5b
6
7
7a
7b
7c
9
9a
9b
9c
9d
11a
11b
13a
13b
14
14
15
15
15a
15b
CL1
CL2

FIG. 2

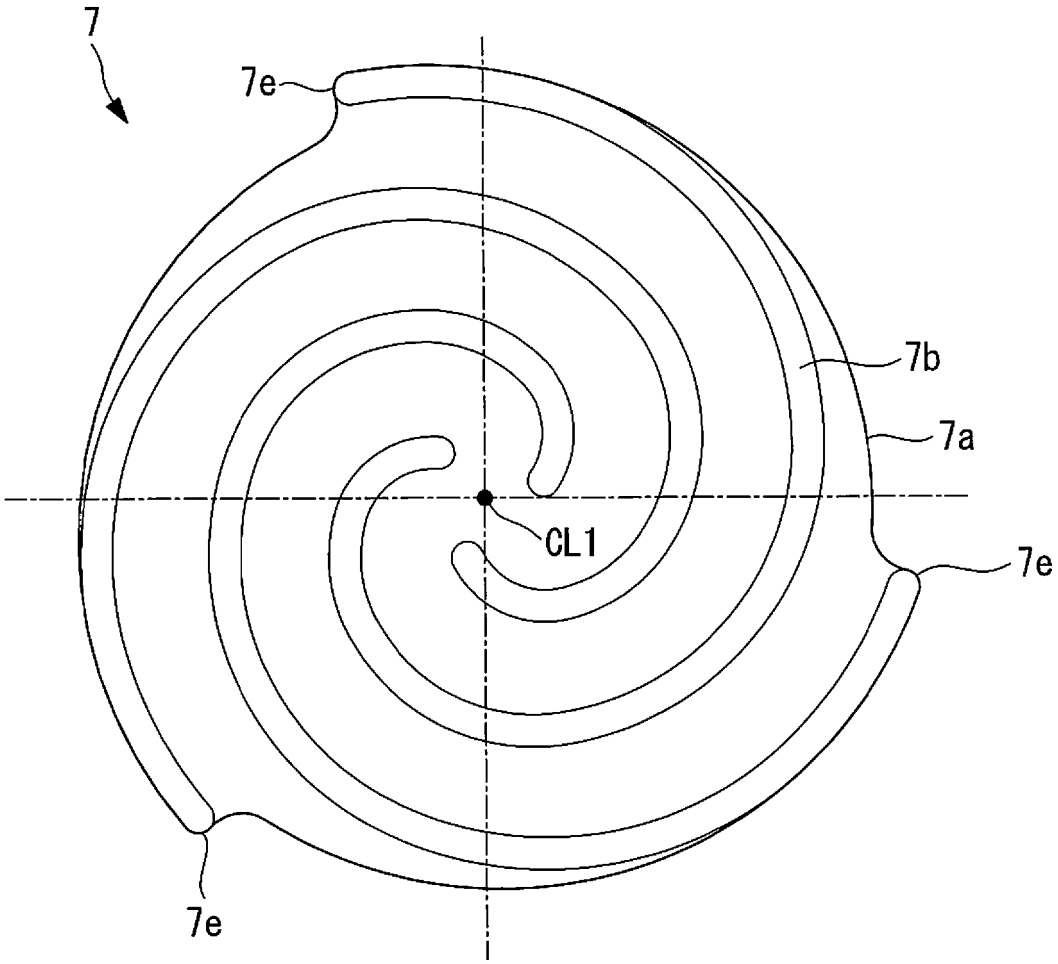


FIG. 3

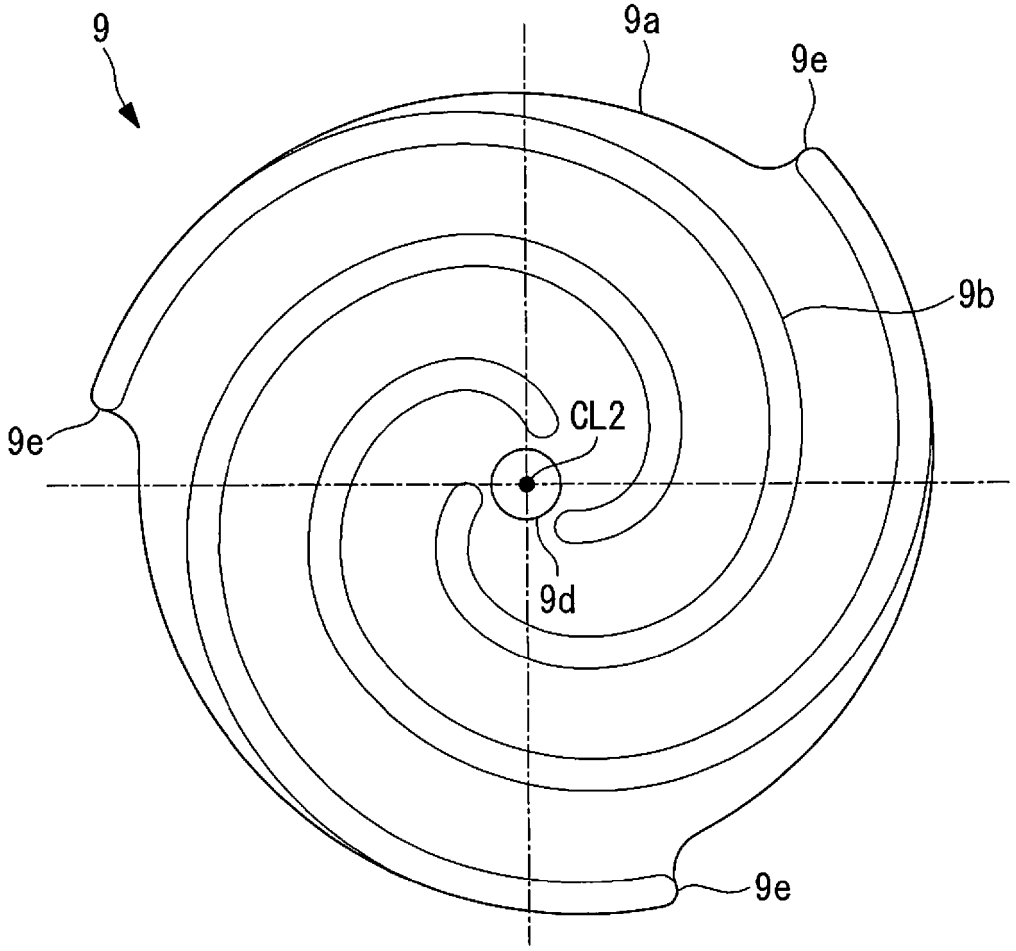


FIG. 4

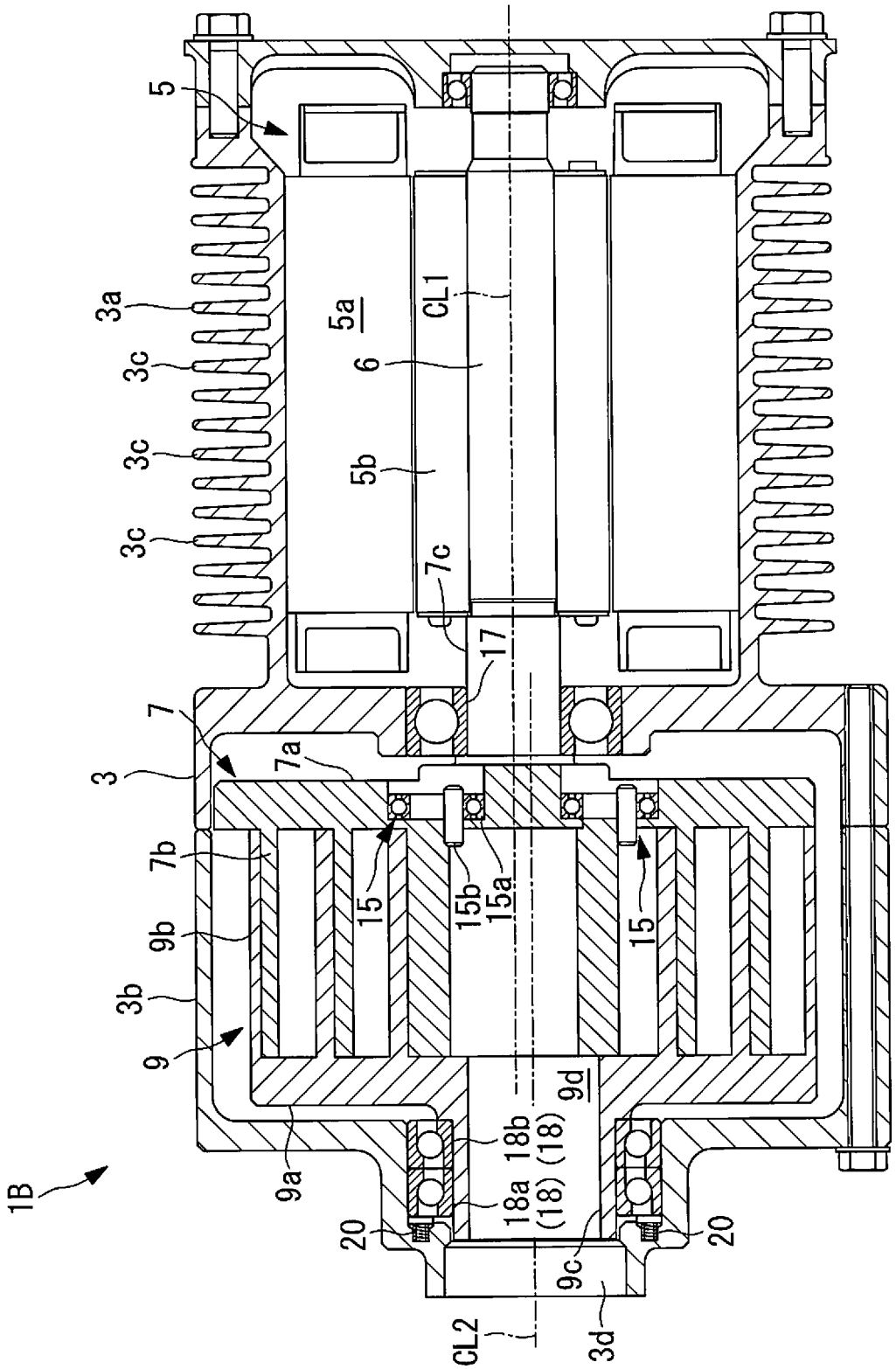

1B
5
3a
3c
3c
3c
5a
6
CL1
5b
7c
17
7
7a
3
7b
9b
3b
9
15
15b
15a
15
9a
9d
18b
18a
(18) (18)
20
20
9c
CL2
3d

FIG. 5

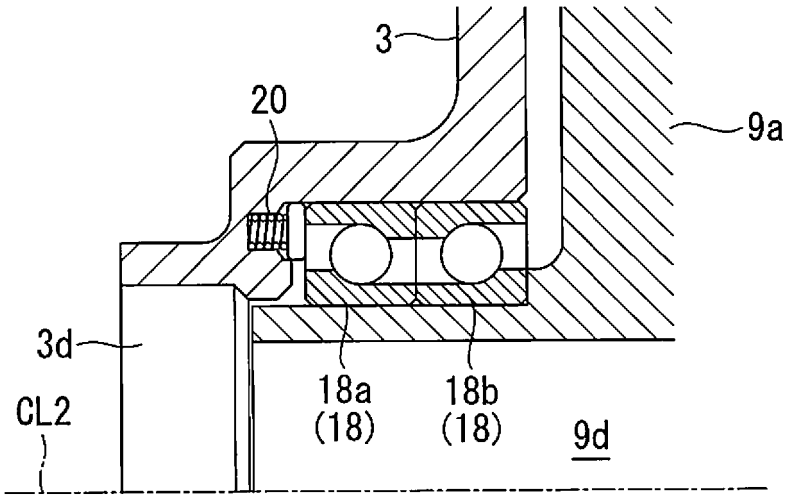


FIG. 6

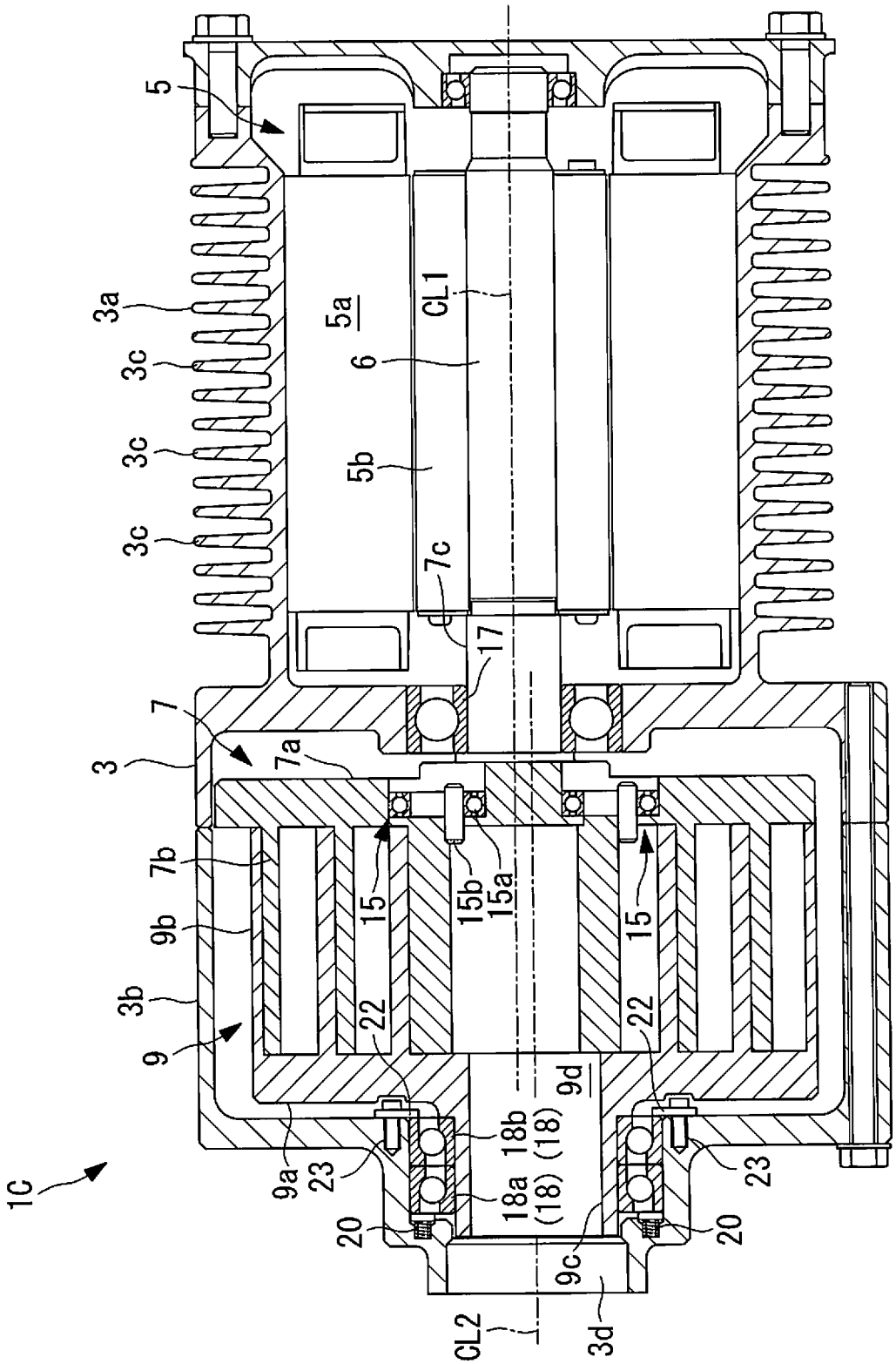
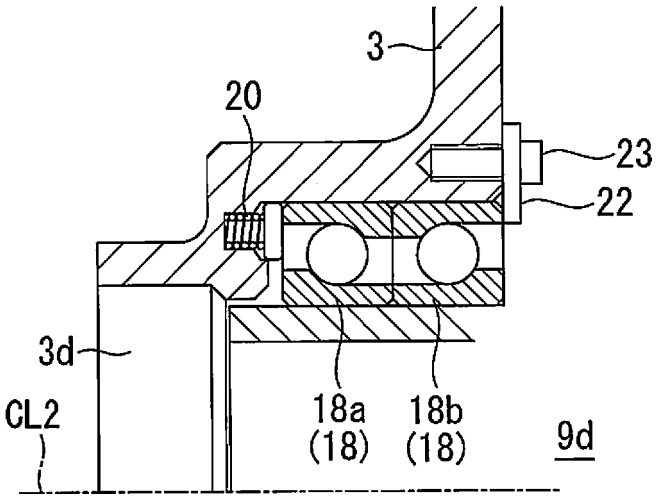

1C
5
3a
3c
3c
3c
5a
6
5b
CL1
7c
17
7
7a
3
7b
9b
3b
9
15
15b
15a
15
22
22
9d
18b
(18)
18a
(18)
9a
23
23
20
20
9c
CL2
3d

FIG. 7



REFERENCES CITED IN THE DESCRIPTION

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