

Description

The present invention relates to a refrigerant compressor, and more particularly, to a slant plate type compressor, such as a wobble plate type compressor for use in an automotive air conditioning system.

As disclosed in U.S.-A. 4,073,603, and Japanese Patent Application Publication No. 64-29,678, a slant plate type compressor includes a balance weight ring of substantial mass disposed on the nose of the hub or "boss" of the slant plate, in order to balance the slant plate under dynamic operating conditions. The balance weight ring is held in place by means of a retaining ring.

Figures 1 and 2 show a slant plate type compressor as disclosed in the Japanese application. Boss 54 of slant plate 50 includes smaller diameter portion 54a at an axially rearward end (to the right in Figure 1 and to the top in Figure 2) thereof, resulting in the formation of annular shoulder 541 forward of portion 54a. Annular balance weight ring 500 is mounted about smaller diameter portion 54a, in contact with shoulder 541. Balance weight ring 500 includes annular depression 501 formed at an inner periphery of the axially rearward surface, reducing the thickness of ring 500 at the inner periphery. Relatively thin plate portion 502 remains at the inner periphery of balance weight ring 500, forward of depression 501. With further reference to Figure 2 annular groove 55 is formed in the radially outer peripheral surface of smaller diameter portion 54a, and annular snap ring 56 is disposed therein. Snap ring 56 includes annular tapered surface 56a formed at a radially inner portion of the axially rearward surface. Rearward annular wall 55a of annular groove 55 slants inwardly (to the left in Figure 2) at an angle generally corresponding to the angle of annular tapered surface 56a of snap ring 56 such that snap ring 56 may be slidably fitted and retained within groove 55. The radially outer portion of snap ring 56 extends exteriorly of groove 55 and contacts thin-plate portion 502 of balance weight ring 500. Thin plate portion 502 is retained between snap ring 56 and annular shoulder 541. Therefore, balance weight ring 500 is retained on boss 54.

However, when the compressor operates under unusual or extreme conditions, for example, when the rotational speed of the compressor is extremely high, when the rotational speed of the compressor is suddenly increased, or when refrigerant in the liquid state is present in the compressor, an extremely large force is produced which tends to cause snap ring 56 to expand in the radially outer direction. As a result, snap ring 56 may slip out of groove 55, and out of contact with balance weight ring 500. Without the retaining contact of snap ring 56, balance weight ring 500 will slip off of boss 54 and damage the internal elements of the compressor.

US-A-4073603 discloses a slant plate type refrigerant compressor comprising a compressor housing including a cylinder block, the cylinder block including a plurality of peripherally disposed cylinders, a crank chamber enclosed within the cylinder block at a location forward of the cylinders, the compressor housing including a suction chamber and a discharge chamber formed therein, a piston slidably fitted within each of the cylinders, a drive mechanism coupled to the piston to reciprocate the pistons within the cylinders, the drive mechanism including a drive shaft rotatably supported in the housing, the drive mechanism further including coupling means for coupling the drive shaft to the pistons such that rotary motion of the drive shaft is converted into reciprocating motion of the pistons in the cylinders, the coupling means including a slant plate disposed on the drive shaft and having a surface disposed at an inclined angle relative to the drive shaft, the slant plate having a boss, an annular balance weight disposed about the boss, the annular balance weight including a thin plate region defining a recessed portion, and a retaining means including a first annular groove formed on the boss and a first annular member disposed in both the groove and the recessed portion, the first annular member in contact with the recessed portion of the balance weight to retain the balance weight on the boss of the slant plate; and according to the present invention, such a compressor is characterised by the retaining means further comprising a second annular member securely disposed in the recessed portion peripherally around the first annular member, the second annular member acting to retain securely the first annular member in the groove to retain securely the balance weight on the boss.

In the accompanying drawings:-

Figure 1 shows a vertical longitudinal sectional view of a slant plate type refrigerant compressor in accordance with the prior art.

Figure 2 shows an enlarged partial sectional view of the compressor shown in Figure 1 including the balance weight ring and retaining mechanism.

Figure 3 shows a vertical longitudinal sectional view of a slant plate type refrigerant compressor in accordance with a first embodiment of the present invention.

Figure 4 shows an enlarged partial sectional view of the compressor shown in Figure 3 including the balance weight ring and a retaining mechanism for preventing the ring from slipping off of the slant plate in accordance with a first embodiment of this invention.

Figures 5(a) and 5(b), respectively, show an enlarged partial sectional view before and after formation of a retaining mechanism for a slant plate type refrigerant compressor in accordance with a third embodiment of the present invention.

In all of Figures 3-5(b) identical reference numer-

als are used to denote elements which are identical to the similarly numbered elements shown in prior art Figures 1 and 2. Additionally, although compressor 10 is shown and is described with respect to Figures 3-10 as a wobble plate type compressor, the invention is not limited thereto and is applicable to any type of slant plate type compressor, including both fixed and variable capacity compressors of the wobble or swash plate type. Furthermore, in the following description, the left side of Figure 3 will be referred to as the front or forward side and the right side will be referred to as the rear side. The remaining Figures show views shifted by approximately 90°. The term "axial" refers to a direction parallel to the longitudinal axis of the drive shaft, and the term "radial" refers to the perpendicular direction. Of course all of the reference directions are made for the sake of convenience of description and are not intended to limit the invention in any way.

With reference to Figures 3-4, the construction of slant plate type compressor 10 in accordance with a first embodiment of the present invention is shown. Compressor 10 includes cylindrical housing assembly 20 including cylinder block 21, front end plate 23 disposed at one end of cylinder block 21, crank chamber 22 formed between cylinder block 21 and front end plate 23, and rear end plate 24 disposed at the opposite end of cylinder block 21. Front end plate 23 is mounted on the open forward end of cylinder block 21 by a plurality of bolts 101 to enclose crank chamber 22 therein. Rear end plate 24 is mounted on cylinder block 21 at its opposite end by a plurality of bolts 102. Valve plate 25 is located between rear end plate 24 and cylinder block 21. Opening 231 is centrally formed in front end plate 23. Drive shaft 26 is supported by bearing 30 disposed in opening 231. Central bore 210 extends through cylinder block 21 to a rearward end surface. The inner (rear) end portion of drive shaft 26 is rotatably supported by bearing 31 disposed within central bore 210 of cylinder block 21. Valve control mechanism 19 is disposed in bore 210 to the rear of drive shaft 26. Cam rotor 40 is fixed on drive shaft 26 by pin member 261, and rotates with shaft 26. Thrust needle bearing 32 is disposed between the axial inner (rear) end surface of front end plate 23 and the adjacent forward axial end surface of cam rotor 40. Cam rotor 40 includes arm 41 having pin member 42 extending therefrom. Slant plate 50 is disposed about drive shaft 26 and includes opening 53 through which drive shaft 26 passes. Slant plate 50 is disposed adjacent cam rotor 40. Slant plate 50 includes arm 51 having slot 52, and boss 54. Cam rotor 40 and slant plate 50 are connected by pin member 42, which is inserted in slot 52 to create a hinged joint. Pin member 42 is slidable within a slot 52 to allow adjustment of the angular position of slant plate 50 with respect to the longitudinal axis of drive shaft 26.

Wobble plate 60 is mounted about boss 54 of

slant plate 50 through bearings 61 and 62 so that slant plate 50 is rotatable with respect thereto. Rotational motion of slant plate 50 causes nutational motion of wobble plate 60. Fork shaped slider 63 is attached to the outer peripheral end of wobble plate 60 and is slidably mounted on sliding rail 64 held between front end plate 23 and cylinder block 21. Fork shaped slider 63 prevents rotation of wobble plate 60 and wobble plate 60 reciprocates along rail 64 when cam rotor 40 and slant plate 50 rotate. Cylinder block 21 includes a plurality of peripherally located cylinder chambers 70 in which pistons 71 reciprocate. Each piston 71 is connected to wobble plate 60 at a peripheral location by a corresponding connecting rod 72. Nutational motion of wobble plate 60 causes pistons 71 to reciprocate in cylinders 70 to compress refrigerant therein.

Rear end plate 24 includes peripherally located annular suction chamber 241 and centrally located discharge chamber 251. Valve plate 25 is located between cylinder block 21 and rear end plate 24 and includes a plurality of valved suction portions 242 linking suction chamber 241 with respective cylinders 70. Valve plate 25 also includes a plurality of valved discharge ports 252 linking discharge chamber 251 with respective cylinders 70. Suction ports 242 and discharge ports 252 are provided with suitable reed valves as described in U.S. Patent No. 4,011,029 to Shimizu. Suction chamber 241 includes inlet portion 241a which is connected to an evaporator of the external cooling circuit (not shown). Discharge chamber 251 is provided with outlet portion 251a connected to a condenser of the cooling circuit (not shown). Gaskets 27 and 28 are located between cylinder block 21 and the inner surface of valve plate 25, and the outer surface of valve plate 25 and rear end plate 24, respectively, to seal the mating surfaces of cylinder block 21, valve plate 25 and rear end plate 24.

Communication path 600 links crank chamber 22 and suction chamber 241 and includes central bore 210 and passageway 150. Valve control mechanism 19 controls the opening and closing of communication path 600 in order to vary the capacity of the compressor, as disclosed in Japanese Patent Application Publication No. 01- 142,276. During operation of compressor 10, drive shaft 26 is rotated by the engine of the vehicle through electromagnetic clutch 300. Cam rotor 40 is rotated with drive shaft 26, rotating slant plate 50 as well, causing wobble plate 60 to nutate. Nutational motion of wobble plate 60 reciprocates pistons 71 in their respective cylinders 70. As pistons 71 are reciprocated, refrigerant gas which is introduced into suction chamber 241 through inlet portion 241a, flows into each cylinder 70 through suction ports 242 and is compressed therein. The compressed refrigerant gas is discharged into discharge chamber 251 from each cylinder 70 through discharge ports 252, and therefrom into the cooling cir-

cuit through outlet portion 251a. The capacity of compressor 10 may be adjusted to maintain a constant pressure in suction chamber 241 in response to a change in the heat load of the evaporator, or a change in the rotating speed of the compressor. The capacity of the compressor is adjusted by changing the angle of the slant plate with respect to a plane perpendicular to the axis of the drive shaft. This angle is dependent upon the crank chamber pressure. An increase in crank chamber pressure decreases the slant angle of the slant plate and the wobble plate, decreasing the capacity of the compressor. A decrease in the crank chamber pressure increases the angle of the slant plate and the wobble plate and thus increases the capacity of the compressor. In the compressor shown in Fig. 3, variable capacity mechanism 19 acts in response to the crank chamber pressure, such that the acting point is modified according to the discharge pressure, to control the link between the crank and suction chambers, to adjust the crank chamber pressure and thereby change the slant angle of slant plate 50 and vary the operating capacity of the compressor. Of course other types of variable displacement mechanisms, or none at all may be used in compressors according to the present invention.

With reference to Figure 4, compressor 10 further includes annular groove 55 formed in the radially outer surface of smaller diameter portion 54a of boss 54. Boss 54 includes annular shoulder 541 forward of smaller diameter portion 54a. Balance weight ring 500 includes annular depression 501 formed at a rearward, radially inner peripheral region, resulting in thin plate portion 502 formed axially forward of depression 501. Thin plate portion 502 fits on annular shoulder 541 of boss 54. Balance weight ring retaining mechanism 81 includes snap ring 56 disposed in groove 55 to the rear of portion 502. Ring 56 retains balance weight ring 500 on slant plate 50 by sandwiching portion 502 against shoulder 541. Mechanism 81 also includes annular member 811 disposed at an outer peripheral region of annular depression 501, surrounding snap ring 56. The width of annular member 811 is selected so as to limit the allowed radially outward expanding motion of snap ring 56, to ensure that snap ring 56 remains within groove 55 even when it is subjected to a radially expanding force which would tend to cause snap ring 56 to radially expand and slip out of groove 55. Annular groove 503 is formed in the radially outer surface of annular depression 501, axially rearward of thin plate portion 502. Snap ring 812 is disposed in groove 503, overlapping and in contact with ring member 811, and acts to retain ring member 811 in annular depression 501 of balance weight ring 500. Snap ring 56 is therefore retained in groove 55 by the provision of annular member 811 and snap ring 812, and prevents balance weight ring 500 from slipping off of slant plate 54.

When the compressor operates under unusual or

extreme conditions, for example, when the rotational speed of the compressor is extremely high, or the rotational speed of the compressor is suddenly increased, or refrigerant in the liquid state is present in the compressor, balance weight ring 500 is securely retained on smaller diameter portion 54a of boss 54 due to retaining mechanism 81. Even if snap ring 56 expands in response to the unusual operating conditions, since the extent of expansion of snap ring 56 is limited, balance weight ring 500 is maintained on boss 54.

With reference to Figures 5(a) and 5(b), a retaining mechanism according to a second embodiment of the invention is shown. Retaining mechanism 83 includes snap ring 56 disposed in groove 55 of boss 54 to retain balance weight ring 500 on slant plate 50 as shown in Figure 4. Retaining mechanism 83 also includes annular member 831 made of soft metal, for example, untempered iron, and disposed around snap ring 56 on a radially outer portion of annular depression 501. Groove 504 is formed in the radially outer surface of annular depression 501 at the same axial location as annular member 831 and snap ring 56. Annular member 831 is caulked to the inner surface of groove 504 by application of annular caulking tool 200, which results in expansion of ring member 831 in both the radially inward and outward directions. Template 250 is disposed about caulking tool 200 to ensure that annular member 831 does not expand in the axial direction. As a result, the radially outer portion of annular member 831 is firmly secured within groove 504, and the radially inner surface of ring member 831 is adjacent the radially outer surface of snap ring 56, thereby limiting the allowed radially outward expansion of snap ring 56 when the compressor operates under unusual operating conditions. Therefore, snap ring 56 is securely retained in groove 55, and balance weight ring 500 is securely retained on boss 54 of slant plate 50.

In the embodiment shown in Figs. 5(a) and 5(b), the caulking is performed completely around the inner periphery of the annular member or thin plate portion. However, the caulking may be performed only intermittently about the periphery, that is the caulking may be accomplished at three or more locations about the periphery at equal angular intervals.

Claims

1. A slant plate type refrigerant compressor (10) comprising a compressor housing (20) including a cylinder block (21), the cylinder block including a plurality of peripherally disposed cylinders (70), a crank chamber (22) enclosed within the cylinder block (21) at a location forward of the cylinders, the compressor housing (20) including a suction chamber (241) and a discharge chamber



cuit through outlet portion 251a. The capacity of compressor 10 may be adjusted to maintain a constant pressure in suction chamber 241 in response to a change in the heat load of the evaporator, or a change in the rotating speed of the compressor. The capacity of the compressor is adjusted by changing the angle of the slant plate with respect to a plane perpendicular to the axis of the drive shaft. This angle is dependent upon the crank chamber pressure. An increase in crank chamber pressure decreases the slant angle of the slant plate and the wobble plate, decreasing the capacity of the compressor. A decrease in the crank chamber pressure increases the angle of the slant plate and the wobble plate and thus increases the capacity of the compressor. In the compressor shown in Fig. 3, variable capacity mechanism 19 acts in response to the crank chamber pressure, such that the acting point is modified according to the discharge pressure, to control the link between the crank and suction chambers, to adjust the crank chamber pressure and thereby change the slant angle of slant plate 50 and vary the operating capacity of the compressor. Of course other types of variable displacement mechanisms, or none at all may be used in compressors according to the present invention.

With reference to Figure 4, compressor 10 further includes annular groove 55 formed in the radially outer surface of smaller diameter portion 54a of boss 54. Boss 54 includes annular shoulder 541 forward of smaller diameter portion 54a. Balance weight ring 500 includes annular depression 501 formed at a rearward, radially inner peripheral region, resulting in thin plate portion 502 formed axially forward of depression 501. Thin plate portion 502 fits on annular shoulder 541 of boss 54. Balance weight ring retaining mechanism 81 includes snap ring 56 disposed in groove 55 to the rear of portion 502. Ring 56 retains balance weight ring 500 on slant plate 50 by sandwiching portion 502 against shoulder 541. Mechanism 81 also includes annular member 811 disposed at an outer peripheral region of annular depression 501, surrounding snap ring 56. The width of annular member 811 is selected so as to limit the allowed radially outward expanding motion of snap ring 56, to ensure that snap ring 56 remains within groove 55 even when it is subjected to a radially expanding force which would tend to cause snap ring 56 to radially expand and slip out of groove 55. Annular groove 503 is formed in the radially outer surface of annular depression 501, axially rearward of thin plate portion 502. Snap ring 812 is disposed in groove 503, overlapping and in contact with ring member 811, and acts to retain ring member 811 in annular depression 501 of balance weight ring 500. Snap ring 56 is therefore retained in groove 55 by the provision of annular member 811 and snap ring 812, and prevents balance weight ring 500 from slipping off of slant plate 54.

When the compressor operates under unusual or

extreme conditions, for example, when the rotational speed of the compressor is extremely high, or the rotational speed of the compressor is suddenly increased, or refrigerant in the liquid state is present in the compressor, balance weight ring 500 is securely retained on smaller diameter portion 54a of boss 54 due to retaining mechanism 81. Even if snap ring 56 expands in response to the unusual operating conditions, since the extent of expansion of snap ring 56 is limited, balance weight ring 500 is maintained on boss 54.

With reference to Figures 5(a) and 5(b), a retaining mechanism according to a second embodiment of the invention is shown. Retaining mechanism 83 includes snap ring 56 disposed in groove 55 of boss 54 to retain balance weight ring 500 on slant plate 50 as shown in Figure 4. Retaining mechanism 83 also includes annular member 831 made of soft metal, for example, untempered iron, and disposed around snap ring 56 on a radially outer portion of annular depression 501. Groove 504 is formed in the radially outer surface of annular depression 501 at the same axial location as annular member 831 and snap ring 56. Annular member 831 is caulked to the inner surface of groove 504 by application of annular caulking tool 200, which results in expansion of ring member 831 in both the radially inward and outward directions. Template 250 is disposed about caulking tool 200 to ensure that annular member 831 does not expand in the axial direction. As a result, the radially outer portion of annular member 831 is firmly secured within groove 504, and the radially inner surface of ring member 831 is adjacent the radially outer surface of snap ring 56, thereby limiting the allowed radially outward expansion of snap ring 56 when the compressor operates under unusual operating conditions. Therefore, snap ring 56 is securely retained in groove 55, and balance weight ring 500 is securely retained on boss 54 of slant plate 50.

In the embodiment shown in Figs. 5(a) and 5(b), the caulking is performed completely around the inner periphery of the annular member or thin plate portion. However, the caulking may be performed only intermittently about the periphery, that is the caulking may be accomplished at three or more locations about the periphery at equal angular intervals.

Claims

1. A slant plate type refrigerant compressor (10) comprising a compressor housing (20) including a cylinder block (21), the cylinder block including a plurality of peripherally disposed cylinders (70), a crank chamber (22) enclosed within the cylinder block (21) at a location forward of the cylinders, the compressor housing (20) including a suction chamber (241) and a discharge chamber



- (251) formed therein, a piston (71) slidably fitted within each of the cylinders (70), a drive mechanism coupled to the piston (71) to reciprocate the pistons within the cylinders (70), the drive mechanism including a drive shaft (26) rotatably supported in the housing (20), the drive mechanism further including coupling means for coupling the drive shaft (26) to the pistons (71) such that rotary motion of the drive shaft (26) is converted into reciprocating motion of the pistons (71) in the cylinders (70), the coupling means including a slant plate (50) disposed on the drive shaft (26) and having a surface disposed at an inclined angle relative to the drive shaft, the slant plate (50) having a boss (54), an annular balance weight (500) disposed about the boss, the annular balance weight (500) including a thin plate region (502) defining a recessed portion (501), and a retaining means including a first annular groove (55) formed on the boss (54) and a first annular member (56) disposed in both the groove and the recessed portion (501), the first annular member (56) in contact with the recessed portion (501) of the balance weight (500) to retain the balance weight on the boss (54) of the slant plate (50), characterised by the retaining means further comprising a second annular member (811,831) securely disposed in the recessed portion (501) peripherally around the first annular member (56), the second annular member (811,831) acting to retain securely the first annular member (56) in the groove to retain securely the balance weight (500) on the boss (54).
2. A compressor according to claim 1, wherein the boss (54) comprises a narrow diameter portion (54a) having an annular shoulder (541), the first annular groove (55) being formed in the narrow diameter portion (54a), and the thin plate region (502) being disposed on the annular shoulder (541) about the narrow diameter portion (54a).
 3. A compressor according to claim 1 or claim 2, further comprising a second annular groove (503) disposed in a radially outer surface of the recessed portion (501), and a third annular member (812) fixedly disposed in the second annular groove (503) so as to overlap and secure the second annular member (811) in the recessed portion (501).
 4. A compressor according to claim 3, wherein the first (56) and third (812) annular members comprise snap rings, and the second annular member (811) limits radially outward expansion of the first annular member (56).
 5. A compressor according to claim 1 or claim 2, further comprising a second annular groove (504) formed in a radially outer surface of the recessed portion (501), and a radially outer portion of the second annular member (831) firmly disposed in the second annular groove (504).
 6. A compressor according to claim 5, the second annular member (831) comprising a soft metal, and being firmly disposed in the second annular groove (504) by caulking.
 7. A compressor according to claim 6, wherein the second annular member (831) is caulked entirely about the periphery thereof.
 8. A compressor according to claim 6, wherein the second annular member is caulked at three or more equiangularly located positions about the periphery thereof.
 9. A compressor according to any one of claims 6 to 8, wherein the first annular member (56) comprises a snap ring, the soft metal comprising untempered iron.
 10. A compressor according to any one of the preceding claims, the coupling means further comprising a wobble plate (60) disposed about the boss (54), the slant plate (50) rotatable with the drive shaft (26), the pistons linked to the wobble plate (60) by connecting rods (72), rotational motion of the drive shaft (26) and the slant plate (50) causing the wobble plate (60) to nutate and reciprocate the pistons (71) in the cylinders (70).

Patentansprüche

1. Schiefscheibenkühlkompressor mit einem Kompressorgehäuse (10) einschließlich einem Zylinderblock (21), wobei der Zylinderblock eine Mehrzahl von umfangsmäßig vorgesehenen Zylindern (70), eine innerhalb des Zylinderblockes (21) vor den Zylindern eingeschlossene Kurbelkammer (22) aufweist, das Kompressorgehäuse (20) eine darin gebildete Ansaugkammer (241) und Entleerungskammer (251), einen innerhalb eines jeden Zylinders (70) gleitend eingepaßten Kolben (71), einen mit dem Kolben (71) gekoppelten Antriebsmechanismus zum Hin- und Herbewegen der Kolben innerhalb der Zylinder (70) aufweist, der Antriebsmechanismus eine drehbar in dem Gehäuse (20) gelagerte Antriebswelle (26) enthält, der Antriebsmechanismus weiter Kuppelmittel zum Kuppeln der Antriebswelle (26) mit den Kolben (71) derart enthält, das die Drehbewegung der Antriebswelle (26) in eine Hin- und Herbewegung in der Kolben (71) in den Zylindern



- (70) umgewandelt wird, das Kuppelmittel eine auf der Antriebswelle (26) vorgesehene Schiefscheibe (50) enthält mit einer in einem geneigten Winkel relativ zu der Antriebswelle vorgesehenen Oberfläche, die Schiefscheibe (50) einen Vorsprung (54), ein um den Vorsprung vorgesehenes ringförmiges Ausgleichsgewicht (500) aufweist, das ringförmige Ausgleichsgewicht (500) einen ausgeschnittenen Abschnitt (501) definierenden dünnen Plattenbereich (502) und ein Rückhaltemittel enthält, das eine auf dem Vorsprung (54) gebildete erste ringförmige Rille (55) und ein sowohl in der Rille als auch in dem ausgeschnittenen Abschnitt (501) vorgesehenes erstes ringförmiges Teil (56) enthält, das erste ringförmige Teil (56) in Kontakt mit dem ausgeschnittenen Abschnitt (501) des Ausgleichsgewichtes (500) zum Zurückhalten des Ausgleichsgewichtes auf dem Vorsprung (54) der Schiefscheibe (50), gekennzeichnet dadurch, daß das Rückhaltemittel weiter ein fest in dem ausgeschnittenen Abschnitt (501) umfangmäßig um das erste ringförmige Teil (56) vorgesehenes zweites ringförmiges Teil (811, 831) aufweist, wobei das zweite ringförmige Teil (811, 831) zum sicheren Zurückhalten des ersten ringförmigen Teiles (56) in der Rille zum sicheren Zurückhalten des Ausgleichsgewichtes (500) auf den Vorsprung (54) wirkt.
2. Kompressor nach Anspruch 1, bei dem der Vorsprung (54) einen Abschnitt (54a) mit schmalen Durchmesser mit einer ringförmigen Schulter (541) aufweist, wobei die erste ringförmige Rille (55) in dem Abschnitt (54a) mit schmalen Durchmesser gebildet ist und der dünne Plattenbereich (502) auf der ringförmigen Schulter (551) um den Abschnitt (54a) mit schmalen Durchmesser vorgesehen ist.
 3. Kompressor nach Anspruch 1 oder Anspruch 2, weiter mit einer in einer radial äußeren Oberfläche des ausgeschnittenen Abschnittes (501) vorgesehenen zweiten ringförmigen Rille (503) und einem fest in der zweiten ringförmigen Rille (503) vorgesehenen dritten ringförmigen Teil (812) so, daß das zweite ringförmige Teil (811) in dem ausgeschnittenen Abschnitt (501) überlappt und gesichert wird.
 4. Kompressor nach Anspruch 3, bei dem das erste (56) und dritte (812) ringförmige Teil Sprengringe aufweist, und das zweite ringförmige Teil (811) die radial auswärtige Expansion des ersten ringförmigen Teiles (56) begrenzt.
 5. Kompressor nach Anspruch 1 oder 2, weiter mit einer in einer radial äußeren Oberfläche des ausgeschnittenen Abschnittes (501) gebildeten zweiten ringförmigen Rille (504) und einem fest in der zweiten ringförmigen Rille (504) vorgesehenen radial äußeren Abschnitt des zweiten ringförmigen Teiles (811).
 6. Kompressor nach Anspruch 5, wobei das zweite ringförmige Teil (811) ein weiches Metall aufweist und fest in der zweiten ringförmigen Rille (504) durch Verstemmen vorgesehen ist.
 7. Kompressor nach Anspruch 6, bei dem das zweite ringförmige Teil (811) um den gesamten Umfang davon verstemmt ist.
 8. Kompressor nach Anspruch 6, bei dem das zweite ringförmige Teil an drei oder mehr in gleichen Winkelabständen vorgesehenen Positionen um den Umfang darum verstemmt ist.
 9. Kompressor nach einem der Ansprüche 6 bis 8, bei dem das erste ringförmige Teil (56) einen Sprengring aufweist, das weiche Metall ungehärtetes Eisen aufweist.
 10. Kompressor nach einem der vorhergehenden Ansprüche, wobei das Kuppelmittel weiter eine um den Vorsprung (54) vorgesehene Taumelscheibe aufweist, die Schiefscheibe (50) drehbar mit der Antriebswelle (56) ist, die Kolben mit der Taumelscheibe (60) durch Verbindungsstangen (72) verbunden sind, die Drehbewegung der Antriebswelle (26) und der Schiefscheibe (50) bewirkt, das die Taumelscheibe (60) eine Nutationsbewegung ausführt und die Kolben (71) in den Zylindern (70) hin und her bewegt.

Revendications

1. Compresseur de réfrigérant de type à plateau en biaux (10) comprenant un carter de compresseur (20) muni d'un bloc de cylindres (21), ce bloc de cylindres comprenant un certain nombre de cylindres (70) disposés périphérieurement, une chambre de vilebrequin (22) enfermée dans le bloc de cylindres (21) en un point situé en avant des cylindres, le carter de compresseur (20) comprenant une chambre d'aspiration (241) et une chambre de décharge (251) formées dans celui-ci, un piston (71) monté en glissement à l'intérieur de chacun des cylindres (70), un mécanisme d'entraînement couplé à chaque piston (71) pour faire aller et venir les pistons à l'intérieur des cylindres (70), le mécanisme d'entraînement comprenant un arbre d'entraînement (26) monté en rotation dans le carter (20), ce mécanisme d'entraînement comprenant en outre des moyens d'accouplement destinés à coupler l'arbre d'en-



- trainement (26) aux pistons (71) de façon que le mouvement de rotation de l'arbre d'entraînement (26) soit transformé en un mouvement de va-et-vient des pistons (71) dans les cylindres (70), les moyens d'accouplement comprenant un plateau en biais (50) monté sur l'arbre d'entraînement (26) et présentant une surface disposée sous un certain angle d'inclinaison par rapport à l'arbre d'entraînement, le plateau en biais (50) comportant un bossage (54), un contrepoids annulaire (500) disposé autour du bossage, le contrepoids annulaire (500) comprenant une zone de plaque mince (502) délimitant une partie en creux (501), et des moyens de retenue comprenant une première rainure annulaire (55) formée sur le bossage (54) et un premier élément annulaire (56) disposé à la fois dans la rainure et dans la partie en creux (501), le premier élément annulaire (56) étant en contact avec la partie en creux (501) du contrepoids (500) pour retenir ce contrepoids sur le bossage (54) du plateau en biais (50), compresseur caractérisé en ce que les moyens de retenue comprennent en outre un second élément annulaire (811, 831) solidement placé dans la partie en creux (501) dans une disposition périphérique autour du premier élément annulaire (56), et le second élément annulaire (811, 831) servant à retenir solidement le premier élément annulaire (56) dans la rainure de manière à retenir solidement le contrepoids (500) sur le bossage (54).
2. Compresseur selon la revendication 1, caractérisé en ce que le bossage (54) comprend une partie de diamètre resserré (54a) munie d'un épaulement annulaire (541), la première rainure annulaire (55) étant formée dans la partie de diamètre resserré (54a), et la zone de plaque mince (502) étant disposée sur l'épaulement annulaire (541) autour de la partie de diamètre resserré (54a).
 3. Compresseur selon l'une quelconque des revendications 1 et 2, caractérisé en ce qu'il comprend en outre une seconde rainure annulaire (503) disposée dans une surface radialement extérieure de la partie en creux (501), et un troisième élément annulaire (812) monté de façon fixe dans la seconde rainure annulaire (503) de manière à recouvrir et fixer le second élément annulaire (811) dans la partie en creux (501).
 4. Compresseur selon la revendication 3, caractérisé en ce que le premier élément annulaire (56) et le troisième élément annulaire (812) sont constitués par des bagues d'enclenchement, et en ce que le second élément annulaire (811) limite la dilatation radiale vers l'extérieur du premier élément annulaire (56).
 5. Compresseur selon l'une quelconque des revendications 1 et 2, caractérisé en ce qu'il comprend en outre une seconde rainure annulaire (504) formée dans une surface radialement extérieure de la partie en creux (501), et une partie radialement extérieure du second élément annulaire (831) solidement disposée dans la seconde rainure annulaire (504).
 6. Compresseur selon la revendication 5, caractérisé en ce que le second élément annulaire (831) est constitué par un métal mou et se trouve solidement fixé dans la seconde rainure annulaire (504) par matage.
 7. Compresseur selon la revendication 6, caractérisé en ce que le second élément annulaire (831) est complètement maté sur toute sa périphérie.
 8. Compresseur selon la revendication 6, caractérisé en ce que le second élément annulaire est maté en trois points ou plus répartis à des intervalles angulaires égaux sur sa périphérie.
 9. Compresseur selon l'une quelconque des revendications 6 à 8, caractérisé en ce que le premier élément annulaire (56) est constitué par une bague d'enclenchement et en ce que le métal mou est constitué par du fer doux.
 10. Compresseur selon l'une quelconque des revendications précédentes, caractérisé en ce que les moyens d'accouplement comprennent en outre un plateau oscillant (60) disposé autour du bossage (54), en ce que le plateau en biais (50) peut tourner solidement de l'arbre d'entraînement (26), en ce que les pistons sont reliés au plateau oscillant (60) par des tiges de liaison (72), et en ce que le mouvement de rotation de l'arbre d'entraînement (26) et du plateau en biais (50) provoque un mouvement de nutation du plateau oscillant (60) et un mouvement de va-et-vient des pistons (71) dans les cylindres (70).