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(54) VANE-TYPE FLUID TRANSMISSION APPARATUS

SCHAUFELARTIGE FLUIDÜBERTRAGUNGSVORRICHTUNG

APPAREIL DE TRANSMISSION À FLUIDE DU TYPE À ORGANE OBTURATEUR

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(56) References cited:
CN-U- 2 112 009
JP-A- 2011 185 229
US-A- 4 212 603
US-A- 5 160 252
US-A- 5 181 843
US-A- 5 558 511
US-B2- 6 503 071

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Description

FIELD OF THE INVENTION

[0001] The present invention relates to a fluid transmission apparatus, and more particularly, to a vane-type fluid transmission apparatus.

BACKGROUND OF THE INVENTION

[0002] The conventional vane-type pump generally comprises a stator, a rotor and at least one blade, wherein the stator has a room defined therein. The stator has an inlet and an outlet so that the room communicates with outside of the stator. Fluid enters into the room via the inlet and leaves the room via the outlet.

[0003] The rotor is eccentrically located in the room and the outer periphery of the rotor is in contact with the inner periphery of the room. Multiple blades are taken as an example. The rotor has slots for accommodating the blades therein. The blades each have one end pointing the center of the rotor and the other end of each of the blades is in contact with the inner periphery of the room. A space is defined between the inner periphery of the room and the outer periphery of the rotor. By the contact between the rotor, the blades and the inner periphery of the room, multiple partitions are defined to receive fluid.

[0004] When the rotor rotates back and forth, the blades are driven by the rotor and movable back and forth within the slots due to the movement of the rotor. The volumes of the partitions vary due to the back-and-forth movement of the blades, so that the fluid is sucked into the room via the inlet and leaved from the room via the outlet.

[0005] The centrifugal force generated from the blades due to the rotation of the rotor drives the blades outward so as to contact the distal ends of the blades with the inner periphery of the room to pump the fluid. However, when the viscosity of the fluid is high, there will be a gap between the distal ends and the inner periphery of the room and the transmission efficiency of the fluid is reduced.

[0006] US4212603, US5087183, US5160252, US5181843 and US5558511 respectively discloses a fluid transmission apparatus which comprises a stator with an annular groove which shares a common center with the room. The axles of the blades are engaged with the annular groove which guides the movement of the blades. The rotor is eccentrically located in the room and the axis of each of the blades points the center of the rotor, so that the shape of the inner periphery of the room is like oval inner periphery which is difficult to be machined during manufacturing processes. Furthermore, the blades each have a certain thickness, in order to prevent interference between two adjacent distal ends of the blades and the inner periphery of the room, the distal end of each blade is made to be sharpened. The sharp distal end of the blade may vibrate when the fluid passes therethrough and noise is therefore generated. The vibration also generates partial thermo stress which accelerates fatigue of the material at the distal end of the blade.

[0007] US 6 503 071 B2 describes a single vane gas displacement apparatus comprising a stator housing with a right cylindrical bore enclosing an eccentrically mounted rotor which also has a radial slot in which is movably radially positioned a single vane.

SUMMARY OF THE INVENTION

[0008] It is a primary object of the present invention to provide a vane-type fluid transmission apparatus. In the vane-type fluid transmission apparatus, a rotor is eccentrically disposed in a circular room, axles of blades are pivotably connected to pieces that are rotatably movable regarding a center of the room as a rotation center. The blades and the pieces form relative rotation movements. Adapted to a shape of ends of the blades, the blades are kept in a tangential contact with an inner wall of the room. Accordingly, pumping and transmission efficiency of a fluid is increased, and complications for processing the stator to form the room are reduced.

[0009] It is another object of the present invention to provide a vane-type fluid transmission apparatus, which can utilize an inverter motor to connected the shaft of the rotor to control the flow rate of the fluid.

[0010] To achieve the objects above-mentioned, the present invention relates to a fluid transmission apparatus and comprises a stator having a room defined therein and the room has a circular inner periphery, the stator has an inlet and an outlet, the inlet and the outlet communicate with the room; a rotor has a cylindrical body and a shaft extends through the cylindrical body, the cylindrical body is eccentrically located in the room and the outer periphery of the cylindrical body is tangent to the inner periphery of the room, the inlet and the outlet are respectively located adjacent to the position where the outer periphery of the cylindrical body is tangent to the inner periphery of the room, two slots are defined diametrically in the outer periphery of the cylindrical body and communicate with the room; the shaft extends through the stator and is connected with a power source; two blades are respectively located within the slots, the first end of each blade points the axis of the cylindrical body and the second end of each blade is in contact with the inner periphery of the room so as to form a space for receiving fluid between the outer periphery of the cylindrical body and the inner periphery of the room; two first pieces and two second pieces are respectively pivotably connected to the stator, wherein the first pieces are located adjacent to the inner bottom of the cylindrical body and the second pieces are located adjacent to the inner top of the cylindrical body, the first pieces and the second pieces are pivoted about the center of the room, the two blades are respectively and pivotably connected to the first pieces and the second pieces by two respective axles, the blades are pivotable about the center of the room

and linearly movable within the slots; a curved face is defined in the second end of each of the two blades and in contact with the inner periphery of the room, the inner periphery of the room has a radius R1, each of the axles is pivotable by a radius R2, the curved face of the second end of each of the two blades has a radius R3. R3=R1-R2, the two blades and the first pieces are pivoted about two respective centers of the curved faces such that the second ends of the two blades are in contact with the inner periphery of the room. Advantageously the stator has a circular first recess and a circular second recess, the first and second recesses share the center with the room, the first pieces are respectively engaged with the first recess and the second pieces are respectively engaged with the second recess, the first and second pieces are pivoted about the center of the room. Advantageously the first recess of the stator has a first dim in an inner end thereof and the second recess of the stator has a second dim in an inner end thereof. Advantageously a first protrusion extends from a center of the first recess and shares the center with the room, a second protrusion extends from a center of the second recess and shares the center with the room. Advantageously each of the first and second pieces comprises a ring and a protrusion, the rings of the first pieces are mounted to the first protrusion and the rings of the second pieces are mounted to the second protrusion. Advantageously each of the first and second pieces are curved plates and an arc of each of the first and second pieces is over 180 degrees, each of the first pieces is pivotably connected to the first protrusion and each of the second piecesis pivotably connected to the second protrusion. Advantageously each of the first and second pieces comprises a ring and a protrusion which is connected to an inner periphery of the ring, the protrusion is a curved protrusion, the protrusion of ring of each of the first pieces is in contact with the first protrusion, an outer periphery of the ring of each of the first pieces is in contact with an inner wall of the first recess, the protrusion of ring of each of the second pieces is in contact with the second protrusion, an outer periphery of the ring of each of the second pieces is in contact with an inner wall of the second recess. Advantageously the two blades are pivotably connected to the protrusions of the first and second pieces by the axles. Advantageously a groove is defined in an end face of the cylindrical body and two ends of the groove respectively communicate with the slots, the two ends of the groove are located close to the shaft. Advantageously the stator comprises a base and a cover. Advantageously the shaft is connected with an inverter motor. In an alternative solution the vane-type fluid transmission apparatus, comprises a stator, a rotor, a first blade, a second blade, a first piece and a second piece, wherein the stator having a room defined therein and the room having a circular inner periphery, the stator having an inlet and an outlet, the inlet and the outlet communicating with the room;

the rotor having a cylindrical body and a shaft which extends through the cylindrical body, the cylindrical body eccentrically located in the room, an outer periphery of the cylindrical body being tangent to the inner periphery of the room, the inlet and the outlet respectively located adjacent to a position where the outer periphery of the cylindrical body is tangent to the inner periphery of the room, two slots defined diametrically in the outer periphery of the cylindrical body and respectively communicating with the room, the shaft extending through the stator and adapted to be connected with a power source;

the first blade and the second blade located within the slots respectively, a first end of each of the first and second blades pointing an axis of the cylindrical body, a second end of each of the first and second blades being in contact with the inner periphery of the room so as to form a space for receiving fluid between the outer periphery of the cylindrical body and the inner periphery of the room; the first piece and the second piece respectively and pivotably connected to the stator, the first piece being located adjacent to an inner bottom of the cylindrical body and the second piece being located adjacent to an inner top of the cylindrical body, the first piece and the second piece pivoted about a center of the room, the first and second pieces respectively form a pivotal hole and a circular guide slot;

the first blade pivotably connected to an axle and two ends of the axle pivotably connected with the pivotal holes of the first and second pieces, the second blade pivotably connected to a first axle and a second axle, the first axle connected to a first slide and the second axle connected to a second slide, the first slide slidably inserted into the guide slot of the first piece and the second slide slidably inserted into the guide slot of the second piece, the first and second blades pivotable about the center of the room, the first and second blades movable within the guide slots, and

a curved face defined in the second end of the first blade and being in contact with the inner periphery of the room, a curved face defined in the second end of the second blade and being in contact with the inner periphery of the room, the inner periphery of the room having a radius R1, the axle and the first and second axles being pivotable by a radius R2, the curved faces of the first and second blade having a radius R3, R3=R1-R2, a center of the curved face located at a center of the axle, a center of the curved face located at a center of the first and second axles, the second ends of the first and second blades being in contact with the inner periphery of the room. Advantageously the pivotal hole and the guide slot are defined in a first side of the first piece, a second side of the first piece is a closed side, the pivotal hole and the guide slot are defined in a first side of the second piece, a second side of the second piece is a closed side. Advantageously the pivotal hole and the guide slot are defined through the first piece, the pivotal hole and the guide slot are defined through the second piece.

[0011] Therefore, the efficiency of transmission of the fluid is increased and the manufacturing processes for making the room are simplified, the present invention can

utilize an inverter motor to connect the shaft of the rotor to control the flow rate of the fluid.

BRIEF DESCRIPTION OF THE DRAWINGS

[0012]

Fig. 1 is a perspective view to show the fluid transmission apparatus of the present invention;
Fig. 2 is an exploded view to show the fluid transmission apparatus of the present invention;
Fig. 3 is a top view of the base of the fluid transmission apparatus of the present invention;
Fig. 4 is a cross sectional view taken along line 4-4 in Fig. 3;
Fig. 5 is a cross sectional view of the cover of the fluid transmission apparatus of the present invention;
Fig. 6 is a cross sectional view of the fluid transmission apparatus of the present invention;
Fig. 7 is a top view to show the fluid transmission apparatus of the present invention, wherein the cover is removed;
Fig. 8 is an operational status of the fluid transmission apparatus of the present invention;
Fig. 9 is another operational status of the fluid transmission apparatus of the present invention;
Fig. 10 is a cross sectional view of the second embodiment of the fluid transmission apparatus of the present invention;
Fig. 11 is an exploded view to show an exemplary embodiment of the fluid transmission apparatus, which is not part of the invention;
Fig. 12 is a top view to show an exemplary embodiment of the fluid transmission apparatus of the present invention, wherein the cover is removed, which is not part of the invention;
Fig. 13 is an exploded view to show the first piece, the second piece and the rotor of the fourth embodiment of the fluid transmission apparatus of the present invention;
Fig. 14 is an exploded view to show the first piece, the second piece and the rotor of the fifth embodiment of the fluid transmission apparatus of the present invention;
Fig. 15 is an exploded view to show the sixth embodiment of the fluid transmission apparatus of the present invention;
Fig. 16 is an exploded view to show the seventh embodiment of the fluid transmission apparatus of the present invention;
Fig. 17 is an axial cross sectional view of the first piece in the seventh embodiment of the fluid transmission apparatus of the present invention, and
Fig. 18 is an axial cross sectional view of the second piece in the seventh embodiment of the fluid transmission apparatus of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0013] Referring to Figs. 1 and 2, the fluid transmission apparatus of the present invention comprises a stator 10, a rotor 20, two blades 32, 34, two first pieces 40 and two second pieces 50. The stator 10 comprises a base 11 and a cover 12 which is connected to the base 11. A sealing member (not shown) may be connected between the base 11 and the cover 12, and multiple bolts (not shown) are used to connect the base 11 and the cover 12. As shown in Figs. 3 and 4, the stator 10 has a room 13 defined therein and the room 13 has a circular inner periphery 132. The stator 10 has an inlet 14 and an outlet 15. The inlet 14 and the outlet 15 communicate with the room 13 and outside of the stator 10. The stator 10 has a circular first recess 16 defined in the inner top of the room 13. A first protrusion 17 extends from the center of the first recess 16 and shares the center with the room 13. As shown in Fig. 5, the cover 12 has a second recess 18 defined in the underside thereof and faces the room 13. A second protrusion 19 extends from the center of the second recess 18 and shares the center with the room 13.

[0014] As shown in Figs. 2 to 7, the rotor 20 has a cylindrical body 21 and a shaft 22 which extends through the cylindrical body 21. The cylindrical body 21 is eccentrically located in the room 13 and the outer periphery of the cylindrical body 21 is tangent to the inner periphery 132 of the room 13. The inlet 14 and the outlet 15 are respectively located adjacent to the position where the outer periphery of the cylindrical body 21 is tangent to the inner periphery 132 of the room 13. The shaft 22 has one end pivotably connected to the base 11 and the other end of the shaft 22 extends through the stator 10 so as to be connected with a power source such as a motor or an inverter motor (not shown). The shaft 22 is pivotably connected with a plurality of bearings or bushes (not shown) and the bearings are connected to the base 11 and the cover 12 so allow the shaft 22 to be rotated smoothly. Two slots 23 are defined diametrically in the outer periphery of the cylindrical body 21. One end of each of the slots 23 points the center of the cylindrical body 21 and the other end of each of the slots 23 communicates with the room 13. A groove 24 is defined in the end face of the cylindrical body 21 and two ends of the groove 24 respectively communicate with the slots 23. The two ends of the groove 24 are located close to the shaft 22.

[0015] The two blades 32, 34 are respectively located within the slots 23. The first end of each blade 32/34 points the axis of the cylindrical body 21, and the second end of each blade 32/34 is in contact with the inner periphery 132 of the room 13 so as to form a space for receiving fluid between the outer periphery of the cylindrical body 21 and the inner periphery 132 of the room 13.

[0016] The first pieces 40 and two second pieces 50 are respectively pivotably connected to the stator 10. The

first pieces 40 are located adjacent to the inner bottom of the cylindrical body 21 and the second pieces 50 are located adjacent to the inner top of the cylindrical body 21. The first pieces 40 and the second pieces 50 are pivoted about the center of the room 13. Each of the first and second pieces 40, 50 comprises a ring 42/52 and a protrusion 44/54. The protrusion 44/54 is a curved protrusion and connected to the outer periphery of the ring 42/52. The first pieces 40 are pivotably connected to the first recess 16 so that the first pieces 40 are adjacent to the underside of the cylindrical body 21. The rings 42 of the first pieces 40 are mounted to the first protrusion 17 so that the first pieces 40 are pivotable about the center of the room 13. The second pieces 50 are pivotably connected to the second recess 18 so that the second pieces 50 are adjacent to the top of the cylindrical body 21. The rings 52 of the second pieces 50 are mounted to the second protrusion 19 so that the second pieces 50 are pivotable about the center of the room 13. The two blades 32, 34 are respectively and pivotably connected to the first pieces 40 and the second pieces 50 by two respective axles 322, 342. Two ends of the axle 342 are pivotably connected to the protrusions 44, 54 of the first and second pieces 40, 50. When the rotor 20 rotates, the first and second pieces 40, 50 drive the axles 322, 342 to make the blades 32, 34 be pivoted about the center of the room 13. In the meanwhile, the blades 32, 34 are linearly movable in the slots 23. The rings 42 are mounted to the first protrusion 17 so that when the first pieces 40 rotate, there will be no interference between the first pieces 40 and the first protrusion 17. Therefore, the rotation of the first pieces 40 is reliable. The rings 52 are mounted to the second protrusion 19 so that when the second pieces 50 rotate, there will be no interference between the second pieces 50 and the second protrusion 19. Therefore, the rotation of the second pieces 50 is reliable.

[0017] A curved face 324/344 is defined in the second end of each of the two blades 32, 34 and in contact with the inner periphery 132 of the room 13. The inner periphery 132 of the room 13 has a radius R1. Each of the axles 322, 342 is pivotable by a radius R2. The curved face 324/344 of the second end of each of the two blades 32, 34 has a radius R3. The relationship of the three radiuses can be expressed by the equation R3=R1-R2. The two blades 32, 34 and the first pieces 40 are pivoted about two respective centers of the curved faces 324, 344 (the axes of the axles 322, 342) such that the second ends of the two blades 32, 34 are in contact with the inner periphery 132 of the room 13. Therefore, the efficiency of transmission of the fluid is increased and the manufacturing processes for making the room 13 are simplified.

[0018] A power source (not shown) is connected to the shaft 22 to rotate the rotor 20, the blades 32, 34 are rotated about the center of the room 13 and, the blades 32, 34 are respectively rotated relative to the first and second pieces 40, 50. The blades 32, 34 are moved along the slots 23. When the rotor 20 rotates clockwise, as shown in Figs. 8 and 9, the space for receiving fluid in the room 13 are varied along with the rotation of the rotor 20 in the room 13, such that the fluid is sucked into the room 13 via the inlet 14 and the fluid is transmitted by the blades 32, 34 and then flows out from the outlet 15. When the rotor 20 rotates counter-clockwise, the fluid is sucked into the room 13 via the outlet 15 and the fluid is transmitted by the blades 32, 34 and then flows out from the inlet 14. Therefore, by controlling the direction of rotation of the rotor 20, the fluid can be transmitted in desired direction.

[0019] When the rotor 20 rotates, the blades 32, 34 are rotated about the respective axles 322, 342, and the axles 322, 342 move circularly about the center of the room 13 By cooperation of the radius R3 of the curved faces 324, 344, the curved faces 324, 344 of the blades 32, 34 are in contact with the inner periphery 132 of the room 13 without interference so as to increase the efficiency of transmission of fluid. The inner periphery 132 of the room 13 is around inner periphery which reduces the difficulties of machining. Furthermore, when the blades 32, 34 move in the slots 23 back and forth, because the first ends of the two blades 32, 34 point the center of the room 13, and the two slots 23 are in communication with each other via the grooves 24, so that the fluid within the space between the two respective first ends of the blades 32, 34 and the shaft 22 flows between the two slots 23 via the grooves 24. This avoids the positive/negative pressure applied to the two blades 32, 34 so that the blades 32, 34 move smoothly.

[0020] The number of the blades 32, 34 can be three or more than three, and the number of the pieces 40, 50 is also changed along with the change of the blades 32, 34. The number of the slots 23 is correspondingly changed to accommodate the blades 32, 34.

[0021] Fig. 10 shows the second embodiment, the differences between the first and second embodiments are that each of the first recesses 16 of the stator 10 has a first dim 162 in the inner end thereof so as to reduce the contact area between the first pieces 40 and the first recesses 16 and reduce the friction between the first pieces 40 and the base 11. Each of the second recess 18 of the stator 10 has a second dim 182 in the inner end thereof so as to reduce the contact area between the second pieces 50 and the second recesses 18 and reduce the friction between the second pieces 50 and the base 11. Lubricant is received in each of the first and second dims 162, 182.

[0022] Figs. 11 and 12 show the third embodiment which comprises a stator 10, a rotor 20, a blade 32, a first piece 40 and a second piece 50. The differences between the first and third embodiments are that the slot 23 is defined radially in the outer periphery of the cylindrical body 21 and communicates with the room 13. The blade 32 is movable in the slot 23.

[0023] Each of the inlet 14 and the outlet 15 has a check valve (not shown) connected thereto so as to control the direction of the fluid.

[0024] Fig. 13 shows the fourth embodiment wherein the differences between the first and fourth embodiments are that each of the first and second pieces 40, 50 are curved plates and an arc of each of the first and second pieces 40, 50 is over 180 degrees. Each of the first pieces 40 is pivotably connected to the first protrusion (not shown) of the stator (not shown) and each of the second pieces 50 is pivotably connected to the second protrusion (not shown) of the stator (not shown). The blade 32 is connected to an axle 322 which is pivotably connected between the first and second pieces 40, 50. The blade 34 is connected to an axle 342 which is pivotably connected between the first and second pieces 40, 50. When the rotor 20 rotates, the first and second pieces 40, 50 drive the blades 32, 34 by the axles 322, 342 and the blades 32, 34 rotate about the center of the room 13. The blades 32, 34 move along the slots 23 back and forth. Because the arc of each of the first and second pieces 40, 50 is over 180 degrees, the rotation of the first and second pieces 40, 50 is reliable.

[0025] Fig. 14 shows the fifth embodiment of the present invention, wherein the differences between the first and fifth embodiments are that each of the first and second pieces 40, 50 comprises a ring 42/52 and a protrusion 44/54. The protrusion 44/54 is connected to the inner periphery of the ring 42/52. The protrusion 44/54 is a curved protrusion. The protrusion 44 of ring 42 of each of the first pieces 40 is in contact with the outer periphery of the first protrusion (not shown) of the stator (not shown). The outer periphery of the ring 42 of each of the first pieces 40 is in contact with the inner wall of the first recess 16. The protrusion 54 of ring 52 of each of the second pieces 50 is in contact with the outer periphery of the second protrusion (not shown) of the stator (not shown). The outer periphery of the ring 54 of each of the second pieces 50 is in contact with the inner wall of the second recess. The first and second pieces 40, 50 respectively rotate about the center of the room 13, because the outer periphery of the ring 44/54 is in contact with the inner periphery of the first/second recess, so that the rotation of the first and second pieces 40, 50 are reliable. The blade 32 is connected to an axle 322 which is pivotably connected between the protrusions 44, 54 of the first and second pieces 40, 50. The blade 34 is connected to an axle 342 which is pivotably connected between the protrusion 44, 54 of the other two first and second pieces 40, 50. When the rotor 20 rotates, the first and second pieces 40, 50 drive the blades 32, 34 by the axles 322, 342 and the blades 32, 34 rotate about the center of the room 13. The blades 32, 34 move along the slots 23 back and forth.

[0026] Fig. 15 shows the sixth embodiment of the present invention and comprises a stator 10, a rotor 20, a first blade 36, a second blade 38, a first piece 40 and a second piece 50. The differences between the first and sixth embodiments are that the first and second pieces 40, 50 are ring-shaped pieces and the first pieces 40 are mounted to the first protrusion 17 and the second pieces 50 are mounted to the second protrusion (not shown). The first piece 40 and the second piece 50 are pivoted about the center of the room 13. The first and second pieces 40, 50 respectively form a pivotal hole 46/56 and a circular guide slot 48/58. The first blade 36 is pivotably connected to an axle 362 and two ends of the axle 362 are pivotably connected with the pivotal holes 46, 56 of the first and second pieces 40, 50. The first and second pieces 40, 50 drive the first blade 36 to pivot about the center of the room 13 by the axle 362. The second blade 38 is pivotably connected to a first axle 382 and a second axle 384. The first axle 382 is connected to a first slide 386 and the second axle 384 is connected to a second slide 388. The first slide 386 is slidably inserted into the guide slot 48 of the first piece 40 and the second slide 388 is slidably inserted to the guide slot 58 of the second piece 50. The first and second pieces 40, 50 drive the first and second axes 382, 384 to rotate the second blade 38 to be pivotable about the center of the room 13. The first and second slides 386, 388 are movable along with the guide slots 48, 58 back and forth.

[0027] Fig. 16 shows the seventh embodiment which is amended from the fifth embodiment, wherein the first and second pieces 40, 50 are located symmetrically relative to the cylindrical body 21. As shown in Fig. 17, the first piece 40 has a pivotal hole 46 and a curved guide slot 48. The pivotal hole 46 and the guide slot 48 are defined in the first side of the first piece 40, the second side of the first piece 40 is a closed side. As shown in Fig. 18, the second piece 50 has a pivotal hole 56 and a curved guide slot 58. The pivotal hole 56 and the guide slot 58 are defined in the first side of the second piece 50, and the second side of the second piece 50 is a closed side.

[0028] The embodiments described in the above can utilize an inverter motor to connect the shaft of the rotor to control the flow rate of the fluid.

[0029] While inventor have shown and described the embodiment in accordance with the present invention, it should be clear to those skilled in the art that further embodiments may be made without departing from the scope of the claims.

Claims

1. A fluid transmission apparatus comprising:

a stator (10) having a room (13) defined therein and the room (13) having a circular inner periphery (132), the stator (10) having an inlet (14) and an outlet (15), the inlet (14) and the outlet (15) communicating with the room (13);

a rotor (20) having a cylindrical body (21) and a shaft (22) which extends through the cylindrical body (21), the cylindrical body (21) eccentrically located in the room (13), an outer periphery of the cylindrical body (21) being tangent to the in-

ner periphery (132) of the room (13), the inlet (14) and the outlet (15) respectively located adjacent to a position where the outer periphery of the cylindrical body (21) is tangent to the inner periphery (132) of the room (13), two slots (23) defined diametrically in the outer periphery of the cylindrical body (21) and communicating with the room (13), the shaft (22) extending through the stator (10) and adapted to be connected with a power source;

two blades (32, 34) respectively located within the slots (23), a first end of each blade (32, 34) pointing an axis of the cylindrical body (21), a second end of each blade (32, 34) being in contact with the inner periphery (132) of the room (13) so as to form a space for receiving fluid between the outer periphery of the cylindrical body (21) and the inner periphery (132) of the room (13);

two first pieces (40) and two second pieces (50) respectively pivotably connected to the stator (10), the first pieces (40) being located adjacent to an underside of the cylindrical body (21) and the second pieces (50) being located adjacent to a top of the cylindrical body (21), the first pieces (40) and the second pieces (50) pivoted about a center of the room and

the two blades (32, 34) respectively and pivotably connected to the first pieces (40) and the second pieces (50) by two respective axles (322, 342), the blades (32, 34) being pivotable about the center of the room (13) and linearly movable within the slots (23), a curved face (324/344) defined in the second end of each of the two blades (32, 34) and being in contact with the inner periphery (132) of the room (13), the inner periphery (132) of the room (13) having a radius R1, each of the axles (322, 342) being pivotable by a radius R2, the curved face (324/344) of the second end of each of the two blades (32, 34) having a radius R3, R3=R1-R2, the two blades (32, 34) and the first pieces (40) being pivoted about two respective centers of the curved faces (324, 344) such that the second ends of the two blades (32, 34) are in contact with the inner periphery (132) of the room (13).

2. The apparatus as claimed in claim 1, wherein the stator (10) has a circular first recess (16) and a circular second recess (18), the first and second recesses (16, 18) share the center with the room (13), the first pieces (40) are respectively engaged with the first recess (16) and the second pieces (50) are respectively engaged with the second recess (18), the first and second pieces (40, 50) are pivoted about the center of the room (13).

3. The apparatus as claimed in claim 2, wherein the first recess (16) of the stator (10) has a first dim (162) in an inner end thereof and the second recess (18) of the stator (10) has a second dim (182) in an inner end thereof.

4. The apparatus as claimed in claim 2, wherein a first protrusion (17) extends from a center of the first recess (16) and shares the center with the room (13), a second protrusion (19) extends from a center of the second recess (18) and shares the center with the room (13).

5. The apparatus as claimed in claim 4, wherein each of the first and second pieces (40, 50) comprises a ring (42/52) and a protrusion (44/54), the rings (42) of the first pieces (40) are mounted to the first protrusion (17) and the rings (52) of the second pieces (50) are mounted to the second protrusion (19).

6. The apparatus as claimed in claim 4, wherein each of the first and second pieces (40, 50) are curved plates and an arc of each of the first and second pieces (40, 50) is over 180 degrees, each of the first pieces (40) is pivotably connected to the first protrusion (17) and each of the second pieces (50) is pivotably connected to the second protrusion (19).

7. The apparatus as claimed in claim 4, wherein each of the first and second pieces (40, 50) comprises a ring (42/52) and a protrusion (44/54) which is connected to an inner periphery of the ring (42/52), the protrusion (44/54) is a curved protrusion, the protrusion (44) of ring (42) of each of the first pieces (40) is in contact with the first protrusion (17), an outer periphery of the ring (42) of each of the first pieces (40) is in contact with an inner wall of the first recess (16), the protrusion (54) of ring (52) of each of the second pieces (50) is in contact with the second protrusion (19), an outer periphery of the ring (52) of each of the second pieces (50) is in contact with an inner wall of the second recess (19).

8. The apparatus as claimed in claim 5 or 7, wherein the two blades (32, 34) are pivotably connected to the protrusions (44, 54) of the first and second pieces (40, 50) by the axles (322, 342).

9. The apparatus as claimed in claim 1, wherein a groove (24) is defined in an end face of the cylindrical body (21) and two ends of the groove (24) respectively communicate with the slots (23), the two ends of the groove (24) are located close to the shaft (22).

10. The apparatus as claimed in claim 1, wherein the stator (10) comprises a base (11) and a cover (12), and/or

wherein the shaft (22) is connected with an inverter motor.

11. A fluid transmission apparatus comprising:

a stator (10) having a room (13) defined therein and the room (13) having a circular inner periphery (132), the stator (10) having an inlet (14) and an outlet (15), the inlet (14) and the outlet (15) communicating with the room (13);
a rotor (20) having a cylindrical body (21) and a shaft (22) which extends through the cylindrical body (21), the cylindrical body (21) eccentrically located in the room (13), an outer periphery of the cylindrical body (21) being tangent to the inner periphery (132) of the room (13), the inlet (14) and the outlet (15) respectively located adjacent to a position where the outer periphery of the cylindrical body (21) is tangent to the inner periphery (132) of the room (13), two slots (23) defined diametrically in the outer periphery of the cylindrical body (21) and respectively communicating with the room (13), the shaft (22) extending through the stator (10) and adapted to be connected with a power source;
a first blade (36) and a second blade (38) located within the slots (23) respectively, a first end of each of the first and second blades (36, 38) pointing an axis of the cylindrical body (21), a second end of each of the first and second blades (36, 38) being in contact with the inner periphery (132) of the room (13) so as to form a space for receiving fluid between the outer periphery of the cylindrical body (21) and the inner periphery (132) of the room (13);
a first piece (40) and a second piece (50) respectively and pivotably connected to the stator (10), the first piece (40) being located adjacent to an underside of the cylindrical body (21) and the second piece (50) being located adjacent to a top of the cylindrical body (21), the first piece (40) and the second piece (50) pivoted about a center of the room (13), the first and second pieces (40, 50) respectively form a pivotal hole (46/56) and a circular guide slot (48/58);
the first blade (36) pivotably connected to an axle (362) and two ends of the axle (362) pivotably connected with the pivotal holes (46, 56) of the first and second pieces (40, 50), the second blade (38) pivotably connected to a first axle (382) and a second axle (384), the first axle (382) connected to a first slide (386) and the second axle (384) connected to a second slide (388), the first slide (386) slidably inserted into the guide slot (48) of the first piece (40) and the second slide (388) slidably inserted into the guide slot (58) of the second piece (50), the first and second blades (36, 38) pivotable about the center of the room (13), the first and second blades (36, 38) movable within the guide slots (23), and a curved face (361) defined in the second end of the first blade (36) and being in contact with the inner periphery (132) of the room (13), a curved face (381) defined in the second end of the second blade (38) and being in contact with the inner periphery (132) of the room (13), the inner periphery (132) of the room (13) having a radius R1, the axle (362) and the first and second axles (382, 384) being pivotable by a radius R2, the curved face (361/381) of the first/second blade (36, 38) having a radius R3, R3=R1-R2, a center of the curved face (361) located at a center of the axle (362), a center of the curved face (381) located at a center of the first and second axles (382, 384), the second ends of the first and second blades (36, 38) being in contact with the inner periphery (132) of the room (13).

12. The apparatus as claimed in claim 11, wherein the pivotal hole (46) and the guide slot (48) are defined in a first side of the first piece (40), a second side of the first piece (40) is a closed side, the pivotal hole (56) and the guide slot (58) are defined in a first side of the second piece (50), a second side of the second piece (50) is a closed side.

13. The apparatus as claimed in claim 11, wherein the pivotal hole (46) and the guide slot (48) are defined through the first piece (40), the pivotal hole (56) and the guide slot (58) are defined through the second piece (50).

Patentansprüche

1. Fluidübertragungseinrichtung, umfassend:

einen Stator (10), der einen darin definierten Raum (13) aufweist, und wobei der Raum (13) einen kreisförmigen Innenumfang (132) aufweist, wobei der Stator (10) einen Einlass (14) und einen Auslass (15) aufweist, wobei der Einlass (14) und der Auslass (15) mit dem Raum (13) verbunden sind;
einen Rotor (20), der einen zylindrischen Körper (21) und eine Welle (22) aufweist, die sich durch den zylindrischen Körper (21) erstreckt, wobei sich der zylindrische Körper (21) exzentrisch in dem Raum (13) befindet, wobei ein Außenumfang des zylindrischen Körpers (21) tangential zu dem Innenumfang (132) des Raumes (13) ist, sich der Einlass (14) und der Auslass (15) jeweils benachbart zu einer Position befinden, an der der Außenumfang des zylindrischen Körpers (21) tangential zu dem Innenumfang (132) des Raumes (13) ist, zwei Schlitze (23) diametral in dem Außenumfang des zylindrischen Körpers (21) definiert sind und mit dem Raum (13) verbunden sind, wobei sich die Welle (22) durch

den Stator (10) erstreckt und angepasst ist, mit einer Energiequelle verbunden zu sein;
zwei Blätter (32, 34), die sich jeweils innerhalb der Schlitze (23) befinden, wobei ein erstes Ende von jedem Blatt (32, 34) zu einer Achse des zylindrischen Körpers (21) gerichtet ist, wobei ein zweites Ende von jedem Blatt (32, 34) mit dem Innenumfang (132) des Raumes (13) in Kontakt ist, um einen Raum zum Aufnehmen von Fluid zwischen dem Außenumfang des zylindrischen Körpers (21) und dem Innenumfang (132) des Raumes (13) zu bilden;
zwei erste Teile (40) und zwei zweite Teile (50), die jeweils schwenkbar mit dem Stator (10) verbunden sind, wobei sich die ersten Teile (40) benachbart zu einer Unterseite des zylindrischen Körpers (21) befinden und sich die zweiten Teile (50) benachbart zu einem Oberteil des zylindrischen Körpers (21) befinden, die ersten Teile (40) und die zweiten Teile (50) um eine Mitte des Raumes (13) geschwenkt werden, und wobei die zwei Blätter (32, 34) jeweils durch zwei entsprechende Achsen (322, 342) mit den ersten Teilen (40) und den zweiten Teilen (50) schwenkbar verbunden sind, die Blätter (32, 34) um die Mitte des Raumes (13) schwenkbar sind und linear innerhalb der Schlitze (23) beweglich sind, eine gekrümmte Fläche (324/344) in dem zweiten Ende von jedem der zwei Blätter (32, 34) definiert ist und mit dem Innenumfang (132) des Raumes (13) in Kontakt ist, wobei der Innenumfang (132) des Raumes (13) einen Radius R1 aufweist, wobei jede der Achsen (322, 342) um einen Radius R2 schwenkbar ist, wobei die gekrümmte Fläche (324/344) von dem zweiten Ende von jedem der zwei Blätter (32, 34) einen Radius R3 aufweist, R3=R1-R2, wobei die zwei Blätter (32, 34) und die ersten Teile (40) derart um zwei entsprechende Mitten der gekrümmten Flächen (324, 344) geschwenkt werden, dass die zweiten Enden von den zwei Blättern (32, 34) mit dem Innenumfang (132) des Raumes (13) in Kontakt sind.

2. Einrichtung nach Anspruch 1, wobei der Stator (10) eine erste kreisförmige Aussparung (16) und eine zweite kreisförmige Aussparung (18) aufweist, wobei die erste und die zweite Aussparung (16, 18) die Mitte mit dem Raum (13) teilen, die ersten Teile (40) jeweils mit der ersten Aussparung (16) ineinandergreifen und die zweiten Teile (50) jeweils mit der zweiten Aussparung (18) ineinandergreifen, die ersten und die zweiten Teile (40, 50) werden um die Mitte des Raumes (13) geschwenkt.

3. Einrichtung nach Anspruch 2, wobei die erste Aussparung (16) des Stators (10) eine erste Dämpfung (162) in einem inneren Ende davon aufweist und die zweite Aussparung (18) des Stators (10) eine zweite Dämpfung (182) in einem inneren Ende davon aufweist.

4. Einrichtung nach Anspruch 2, wobei sich ein erster Vorsprung (17) von einer Mitte der ersten Aussparung (16) erstreckt und die Mitte mit dem Raum (13) teilt, sich ein zweiter Vorsprung (19) von einer Mitte der zweiten Aussparung (18) erstreckt und die Mitte mit dem Raum (13) teilt.

5. Einrichtung nach Anspruch 4, wobei jedes von den ersten und den zweiten Teilen (40, 50) einen Ring (42/52) und einen Vorsprung (44/54) umfasst, wobei die Ringe (42) der ersten Teile (40) an dem ersten Vorsprung (17) angebracht sind und die Ringe (52) der zweiten Teile (50) an dem zweiten Vorsprung (19) angebracht sind.

6. Einrichtung nach Anspruch 4, wobei jedes von den ersten und den zweiten Teilen (40, 50) gekrümmte Platten sind und ein Bogen von jedem von den ersten und den zweiten Teilen (40, 50) mehr als 180 Grad ist, wobei jedes von den ersten Teilen (40) schwenkbar mit dem ersten Vorsprung (17) verbunden ist und jedes von den zweiten Teilen (50) schwenkbar mit dem zweiten Vorsprung (19) verbunden ist.

7. Einrichtung nach Anspruch 4, wobei jedes von den ersten und den zweiten Teilen (40, 50) einen Ring (42/52) und einen Vorsprung (44/54) umfasst, der mit einem Innenumfang des Rings (42/52) verbunden ist, der Vorsprung (44/54) ein gekrümmter Vorsprung ist, der Vorsprung (44) des Rings (42) von jedem von den ersten Teilen (40) mit dem ersten Vorsprung (17) in Kontakt ist, ein Außenumfang des Rings (42) von jedem von den ersten Teilen (40) mit einer Innenwand der ersten Aussparung (16) in Kontakt ist, der Vorsprung (54) des Rings (52) von jedem von den zweiten Teilen (50) mit dem zweiten Vorsprung (19) in Kontakt ist, ein Außenumfang des Rings (52) von jedem von den zweiten Teilen (50) mit einer Innenwand der zweiten Aussparung (19) in Kontakt ist.

8. Einrichtung nach Anspruch 5 oder 7, wobei die zwei Blätter (32, 34) durch die Achsen (322, 342) schwenkbar mit den Vorsprüngen (44, 54) der ersten und zweiten Teile (40, 50) verbunden sind.

9. Einrichtung nach Anspruch 1, wobei eine Rille (24) in einer Endfläche des zylindrischen Körpers (21) definiert ist und zwei Enden der Rille (24) jeweils mit den Schlitzen (23) verbunden sind, wobei sich die zwei Enden der Rille (24) in der Nähe der Welle (22) befinden.

10. Einrichtung nach Anspruch 1, wobei der Stator (10)

eine Basis (11) und eine Abdeckung (12) umfasst und/oder
wobei die Welle (212) mit einem Invertermotor verbunden ist.

11. Fluidübertragungseinrichtung, umfassend:

einen Stator (10), der einen darin definierten Raum (13) aufweist, und wobei der Raum (13) einen kreisförmigen Innenumfang (132) aufweist, wobei der Stator (10) einen Einlass (14) und einen Auslass (15) aufweist, wobei der Einlass (14) und der Auslass (15) mit dem Raum (13) verbunden sind;
einen Rotor (20), der einen zylindrischen Körper (21) und eine Welle (22) aufweist, die sich durch den zylindrischen Körper (21) erstreckt, wobei sich der zylindrische Körper (21) exzentrisch in dem Raum (13) befindet, wobei ein Außenumfang des zylindrischen Körpers (21) tangential zu dem Innenumfang (132) des Raumes (13) ist, sich der Einlass (14) und der Auslass (15) jeweils benachbart zu einer Position befinden, an der der Außenumfang des zylindrischen Körpers (21) tangential zu dem Innenumfang (132) des Raumes (13) ist, zwei Schlitze (23) diametral in dem Außenumfang des zylindrischen Körpers (21) definiert sind und jeweils mit dem Raum (13) verbunden sind, wobei sich die Welle (22) durch den Stator (10) erstreckt und angepasst ist, mit einer Energiequelle verbunden zu sein;
ein erstes Blatt (36) und ein zweites Blatt (38), die sich jeweils innerhalb der Schlitze befinden, wobei ein erstes Ende von jedem von dem ersten und dem zweiten Blatt (36, 38) zu einer Achse des zylindrischen Körpers (21) zeigt, wobei ein zweites Ende von jedem von dem ersten und dem zweiten Blatt (36, 38) mit dem Innenumfang (132) des Raumes (13) in Kontakt ist, um einen Raum zum Aufnehmen von Fluid zwischen dem Außenumfang des zylindrischen Körpers (21) und dem Innenumfang (132) des Raumes (13) zu bilden;
ein erstes Teil (40) und ein zweites Teil (50), die jeweils und schwenkbar mit dem Stator (10) verbunden sind, wobei sich das erste Teil (40) benachbart zu einer Unterseite des zylindrischen Körpers (21) befindet und sich das zweite Teil (50) benachbart zu einem Oberteil des zylindrischen Körpers (21) befindet, das erste Teil (40) und das zweite Teil (50) um eine Mitte des Raumes (13) geschwenkt werden, das erste und das zweite Teil (40, 50) jeweils ein Schwenkloch (46/56) und einen kreisförmigen Führungsschlitz (48/58) bilden;
wobei das erste Blatt (36) schwenkbar mit einer Achse (362) verbunden ist und zwei Enden der Achse (362) schwenkbar mit den Schwenklöchern (46, 56) der ersten und zweiten Teile (40, 50) verbunden sind, das zweite Blatt (38) schwenkbar mit einer ersten Achse (382) und einer zweiten Achse (384) verbunden ist, die erste Achse (382) mit einem ersten Schieber (386) verbunden ist und die zweite Achse (384) mit einem zweiten Schieber (388) verbunden ist, der erste Schieber (386) verschiebbar in den Führungsschlitz (48) des ersten Teils (40) eingesetzt ist und der zweite Schieber (388) verschiebbar in den Führungsschlitz (58) des zweiten Teils (50) eingesetzt ist, das erste und das zweite Blatt (36, 38) um die Mitte des Raumes (13) schwenkbar sind, das erste und das zweite Blatt (36, 38) innerhalb der Führungsschlitze (23) beweglich sind, und
eine gekrümmte Fläche (361), die in dem zweiten Ende des ersten Blattes (36) definiert ist und mit dem Innenumfang (132) des Raumes (13) in Kontakt ist, eine gekrümmte Fläche (381), die in dem zweiten Ende des zweiten Blatts (38) definiert ist und mit dem Innenumfang (132) des Raumes (13) in Kontakt ist, wobei der Innenumfang (132) des Raumes (13) einen Radius R1 aufweist, wobei die Achse (362) und die erste und die zweite Achse (382, 384) um einen Radius R2 schwenkbar sind, wobei die gekrümmte Fläche (361/381) des ersten/zweiten Blatts (36, 38) einen Radius R3 aufweist, R3=R1-R2, sich eine Mitte der gekrümmten Fläche (361) an einer Mitte der Achse (362) befindet, sich eine Mitte der gekrümmten Fläche (381) an einer Mitte der ersten und der zweiten Achse (382, 384) befindet, die zweiten Enden des ersten und des zweiten Blatts (36, 38) mit dem Innenumfang (132) des Raumes (13) in Kontakt sind.

12. Einrichtung nach Anspruch 11, wobei das Schwenkloch (46) und der Führungsschlitz (48) in einer ersten Seite des ersten Teils (40) definiert sind, eine zweite Seite des ersten Teils (40) eine geschlossene Seite ist, das Schwenkloch (56) und der Führungsschlitz (58) in einer ersten Seite des zweiten Teils (50) gebildet sind, eine zweite Seite des zweiten Teils (50) eine geschlossene Seite ist.

13. Einrichtung nach Anspruch 11, wobei das Schwenkloch (46) und der Führungsschlitz (48) durch das erste Teil (40) definiert sind, das Schwenkloch (56) und der Führungsschlitz (58) durch das zweite Teil (50) definiert sind.

Revendications

1. Appareil de transmission à fluide comportant :

un stator (10) ayant une chambre (13) définie en son sein et la chambre (13) ayant une périphérie intérieure circulaire (132), le stator (10) ayant une entrée (14) et une sortie (15), l'entrée (14) et la sortie (15) communiquant avec la chambre (13) ;

un rotor (20) ayant un corps cylindrique (21) et un arbre (22) qui s'étend à travers le corps cylindrique (21), le corps cylindrique (21) étant situé de façon excentrique dans la chambre (13), une périphérie extérieure du corps cylindrique (21) étant tangente à la périphérie intérieure (132) de la chambre (13), l'entrée (14) et la sortie (15) étant situées respectivement adjacentes à une position dans laquelle la périphérie extérieure du corps cylindrique (21) est tangente à la périphérie intérieure (132) de la chambre (13), deux encoches (23) étant définies diamétralement dans la périphérie extérieure du corps cylindrique (21) et communiquant avec la chambre (13), l'arbre (22) s'étendant à travers le stator (10) et étant apte à être connecté à une source d'énergie ;

deux lames (32, 34) situées respectivement au sein des encoches (23), une première extrémité de chaque lame (32, 34) pointant vers un axe du corps cylindrique (21), une seconde extrémité de chaque lame (32, 34) étant en contact avec la périphérie intérieure (132) de la chambre (13) de manière à former un espace pour recevoir du fluide entre la périphérie extérieure du corps cylindrique (21) et la périphérie intérieure (132) de la chambre (13) ;

deux premières pièces (40) et deux secondes pièces (50) respectivement connectées de façon pivotante au stator (10), les premières pièces (40) étant situées adjacentes à un côté inférieur du corps cylindrique (21) et les secondes pièces (50) étant situées adjacentes à un dessus du corps cylindrique (21), les premières pièces (40) et les secondes pièces (50) étant mises à pivoter autour d'un centre de la chambre (13), et

les deux lames (32, 34) étant respectivement connectées de façon pivotante aux premières pièces (40) et aux secondes pièces (50) par deux axes respectifs (322, 342), les lames (32, 34) pouvant pivoter autour du centre de la chambre (13) et étant mobiles de façon linéaire au sein des encoches (23), une face incurvée (324/344) étant définie dans la seconde extrémité de chacune des deux lames (32, 34) et étant en contact avec la périphérie intérieure (132) de la chambre (13), la périphérie intérieure (132) de la chambre (13) ayant un rayon R1, chacun des axes (322, 342) pouvant pivoter selon un rayon R2, la face incurvée (324/344) de la seconde extrémité de chacune des deux lames (32, 34) ayant un rayon R3, R3=R1-R2, les deux larmes (32, 34) et les premières pièces (40) étant mises à pivoter autour de deux centres respectifs des faces incurvées (324, 344), de sorte que les secondes extrémités des deux larmes (32, 34) soient en contact avec la périphérie intérieure (132) de la chambre (13).

2. Appareil selon la revendication 1, dans lequel le stator (10) a un premier évidement circulaire (16) et un second évidement circulaire (18), les premier et second évidements (16, 18) partagent le centre avec la chambre (13), les premières pièces (40) sont respectivement en prise avec le premier évidement (16) et les secondes pièces (50) sont respectivement en prise avec le second évidement (18), les premières et secondes pièces (40, 50) sont mises à pivoter autour du centre de la chambre (13).

3. Appareil selon la revendication 2, dans lequel le premier évidement (16) du stator (10) a une première atténuation (162) dans une extrémité intérieure de celui-ci et le second évidement (18) du stator (10) a une seconde atténuation (182) dans une extrémité intérieure de celui-ci.

4. Appareil selon la revendication 2, dans lequel une première saillie (17) s'étend à partir d'un centre du premier évidement (16) et partage le centre avec la chambre (13), une seconde saillie (19) s'étend à partir d'un centre du second évidement (18) et partage le centre avec la chambre (13).

5. Appareil selon la revendication 4, dans lequel chacune des premières et secondes pièces (40, 50) comporte une bague (42/52) et une saillie (44/54), les bagues (42) des premières pièces (40) sont montées sur la première saillie (17) et les bagues (52) des secondes pièces (50) sont montées sur la seconde saillie (19).

6. Appareil selon la revendication 4, dans lequel chacune des premières et secondes pièces (40, 50) sont des plaques incurvées et un arc de chacune des premières et secondes pièces (40, 50) est de plus de 180 degrés, chacune des premières pièces (40) est connectée de façon pivotante à la première saillie (17) et chacune des secondes pièces (50) est connectée pivotante à la seconde saillie (19).

7. Appareil selon la revendication 4, dans lequel chacune des premières et secondes pièces (40, 50) comporte une bague (42/52) et une saillie (44/54) qui est connectée à une périphérie intérieure de la bague (42/52), la saillie (44/54) est une saillie incurvée, la saillie (44) de la bague (42) de chacune des premières pièces (40) est en contact avec la première saillie (17), une périphérie extérieure de la bague

(42) de chacune des premières pièces (40) est en contact avec une paroi intérieure du premier évidement (16), la saillie (54) de la bague (52) de chacune des secondes pièces (50) est en contact avec la seconde saillie (19), une périphérie extérieure de la bague (52) de chacune des secondes pièces (50) est en contact avec une paroi intérieure du second évidement (19).

8. Appareil selon les revendications 5 ou 7, dans lequel les deux lames (32, 34) sont connectées pivotantes aux saillies (44, 54) des premières et secondes pièces (40, 50) par les axes (322, 342).

9. Appareil selon la revendication 1, dans lequel une rainure (24) est définie dans une face d'extrémité du corps cylindrique (21) et deux extrémités de la rainure (24) communiquent respectivement avec les encoches (23), les deux extrémités de la rainure (24) étant situées près de l'arbre (22).

10. Appareil selon la revendication 1, dans lequel le stator (10) comporte une base (11) et un couvercle (12) et/ou
dans lequel l'arbre (22) est connecté à un moteur d'inverseur.

11. Appareil de transmission à fluide comportant :

un stator (10) ayant une chambre (13) définie en son sein et la chambre (13) ayant une périphérie intérieure circulaire (132), le stator (10) ayant une entrée (14) et une sortie (15), l'entrée (14) et la sortie (15) communiquant avec la chambre (13) ;
un rotor (20) ayant un corps cylindrique (21) et un arbre (22) qui s'étend à travers le corps cylindrique (21), le corps cylindrique (21) étant situé de façon excentrique dans la chambre (13), une périphérique extérieure du corps cylindrique (21) étant tangente à la périphérie intérieure (132) de la chambre (13), l'entrée (14) et la sortie (15) étant respectivement situées au niveau d'une position dans laquelle la périphérie extérieure du corps cylindrique (21) est tangente à la périphérie intérieure (132) de la chambre (13), deux encoches (23) étant définies diamétralement dans la périphérie extérieure du corps cylindrique (21) et communiquant respectivement avec la chambre (13), l'arbre (22) s'étendant à travers le stator (10) et étant apte à être connecté à une source d'énergie ;
une première lame (36) et une seconde lame (38) respectivement situées au sein des encoches (23), une première extrémité de chacune des premières et secondes lames (36, 38) pointant vers un axe du corps cylindrique (21), une seconde extrémité de chacune des premières et secondes lames (36, 38) étant en contact avec la périphérie intérieure (132) de la chambre (13) de manière à former un espace pour recevoir du fluide entre la périphérie extérieure du corps cylindrique (21) et la périphérie intérieure (132) de la chambre (13) ;
une première pièce (40) et une seconde pièce (50) respectivement connectées et pivotantes au stator (10), la première pièce (40) étant située adjacente à un côté inférieur du corps cylindrique (21) et la seconde pièce (50) étant située adjacente à un dessus du corps cylindrique (21), la première pièce (40) et la seconde pièce (50) étant mises à pivoter autour d'un centre de la chambre (13), les premières et secondes pièces (40, 50) forment respectivement un trou de pivot (46/56) et une encoche de guidage circulaire (48/58) ;
la première lame (36) étant connectée pivotante à un axe (362) et deux extrémités de l'axe (360) étant connectées pivotantes aux trous de pivot (46, 56) des premières et secondes pièces (40, 50), la seconde lame (38) étant connectée pivotante à un premier axe (382) et à un second axe (384), le premier axe (382) étant connecté à une première lamelle (386) et le second axe (384) étant connecté à une seconde lamelle (388), la première lamelle (386) étant insérée coulissante dans l'encoche de guidage (48) de la première pièce (40) et la seconde lamelle (388) étant insérée coulissante dans l'encoche de guidage (58) de la seconde pièce (50), les première et seconde lames (36, 38) pouvant pivoter autour du centre de la chambre (13), les première et seconde lames (36, 38) étant mobiles au sein des encoches de guidage (23), et
une face incurvée (361) définie dans la seconde extrémité de la première lame (36) et étant en contact avec la périphérie intérieure (132) de la chambre (13), une face incurvée (381) définie dans la seconde extrémité de la seconde lame (38) et étant en contact avec la périphérie intérieure (132) de la chambre (13), la périphérie intérieure (132) de la chambre (13) ayant un rayon R1, l'axe (362) et les premier et second axes (382, 384) pouvant pivoter selon un rayon R2, la face incurvée (361/381) de la première/seconde lame (36, 38) ayant un rayon R3, R3=R1-R2, un centre de la face incurvée (361) située au niveau d'un centre de l'axe (362), un centre de la face incurvée (381) située au niveau d'un centre des premier et second axes (382, 384), les secondes extrémités des première et seconde lames (36, 38) étant en contact avec la périphérie intérieure (132) de la chambre (13).

12. Appareil selon la revendication 11, dans lequel le trou de pivot (46) et l'encoche de guidage (48) sont

définis dans un premier côté de la première pièce (40), un second côté de la première pièce (40) est un côté fermé, le trou de pivot (56) et l'encoche de guidage (58) sont définis dans un premier côté de la seconde pièce (50), un second côté de la seconde pièce (50) est un côté fermé.

13. Appareil selon la revendication 11, dans lequel le trou de pivot (46) et l'encoche de guidage (48) sont définis à travers la première pièce (40), le trou de pivot (56) et l'encoche de guidage (58) sont définis à travers la seconde pièce (50).

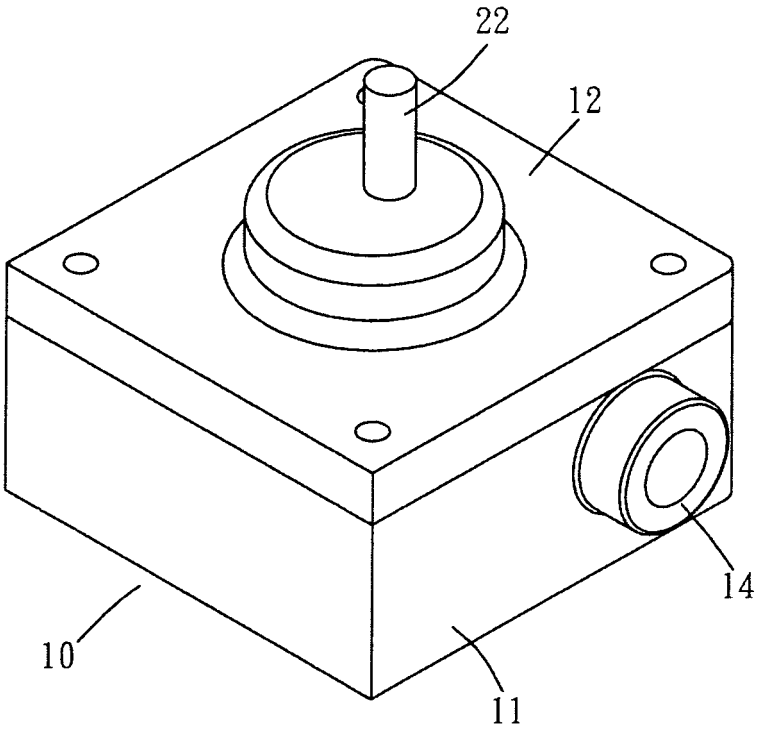

FIG. 1

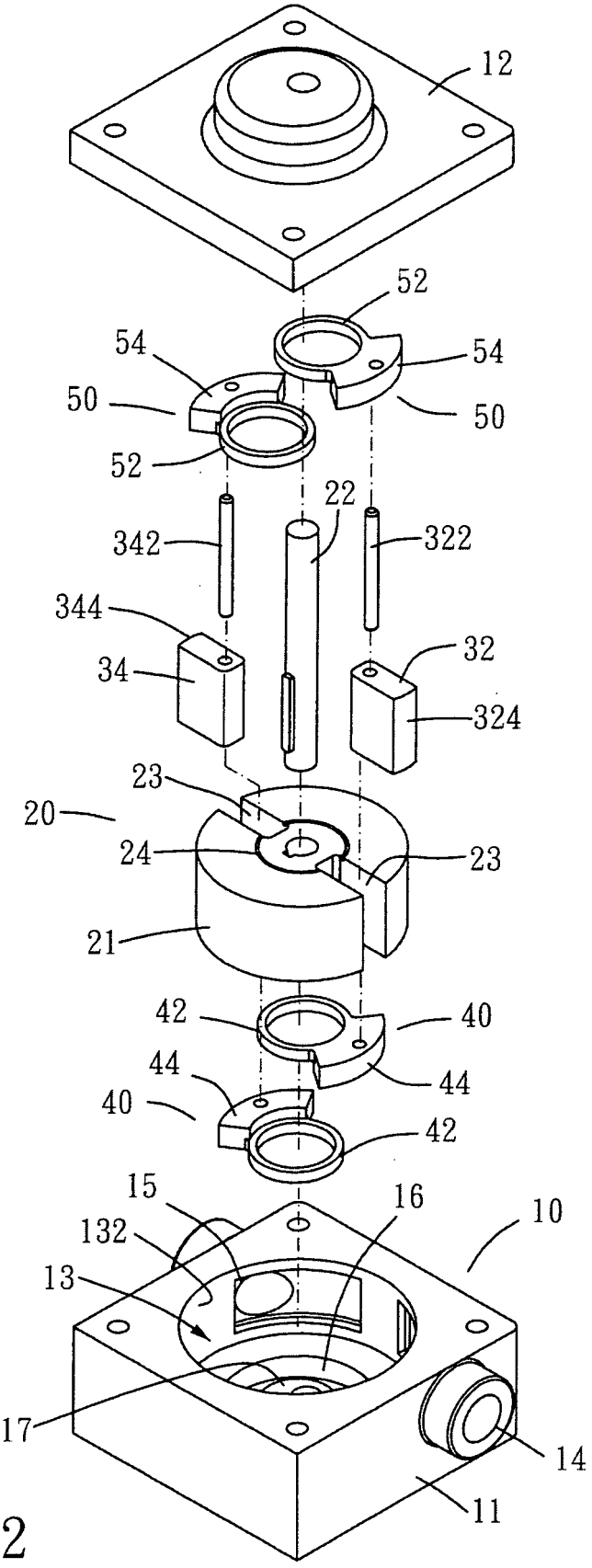
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FIG. 2

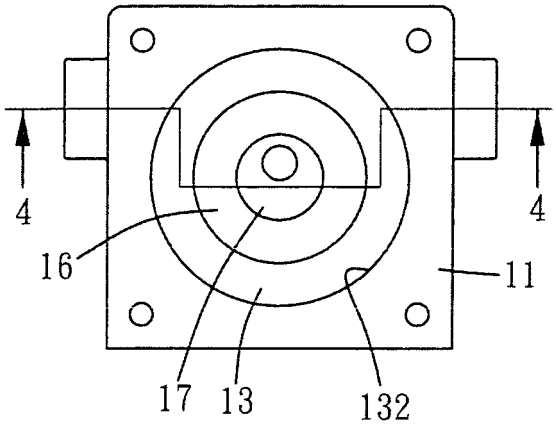

FIG. 3

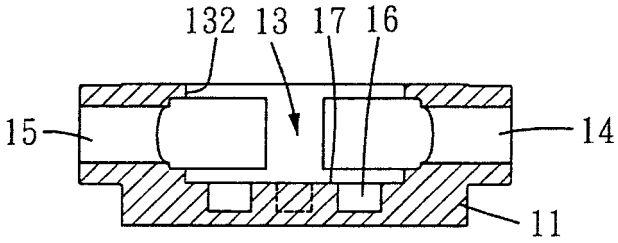

FIG. 4

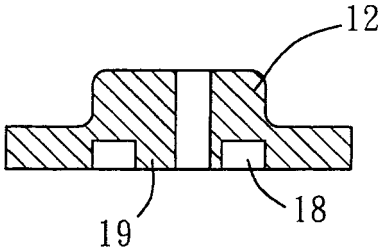

FIG. 5

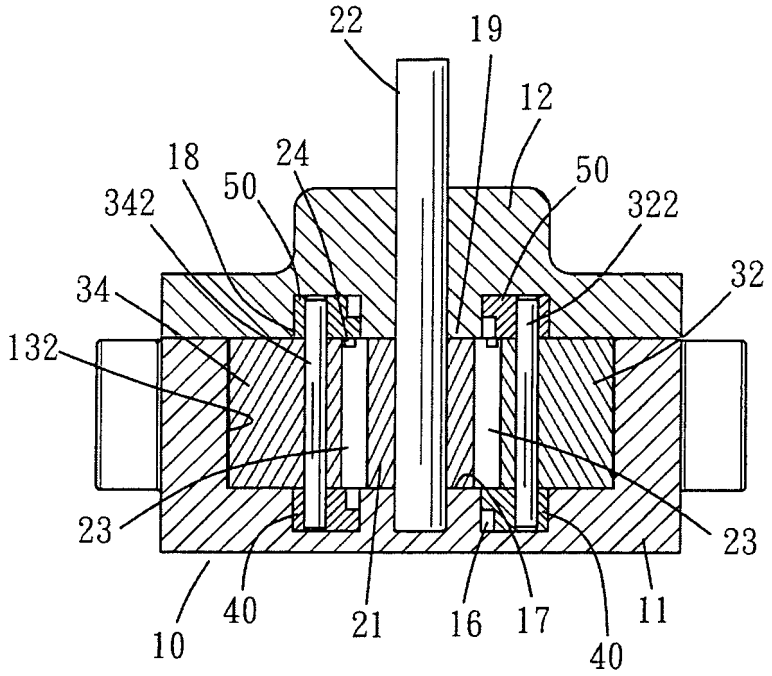
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FIG. 6

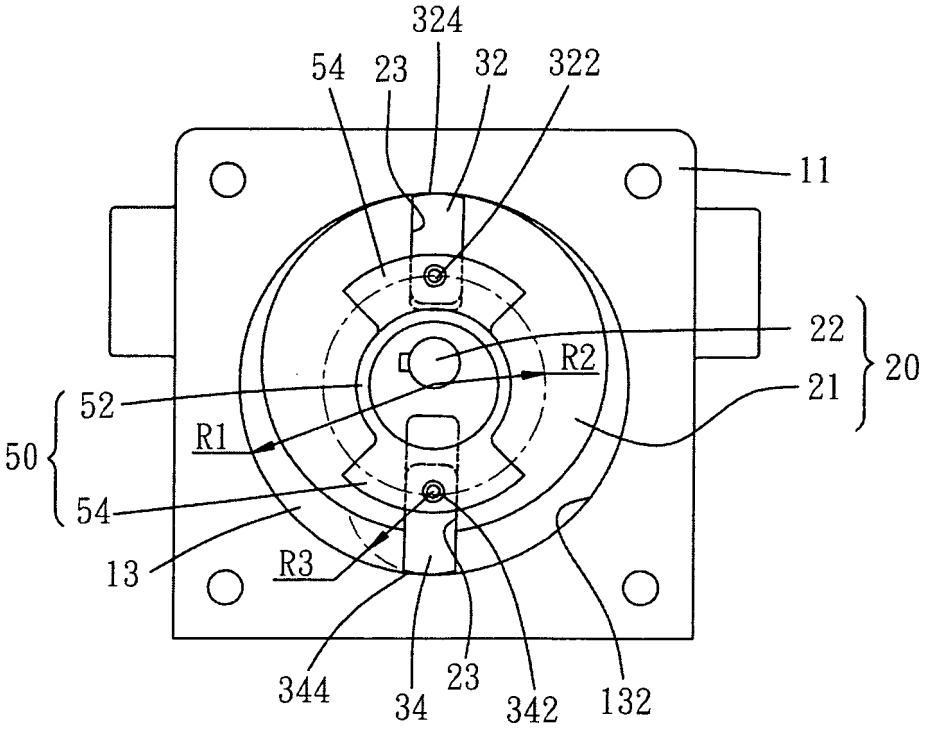
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FIG. 7

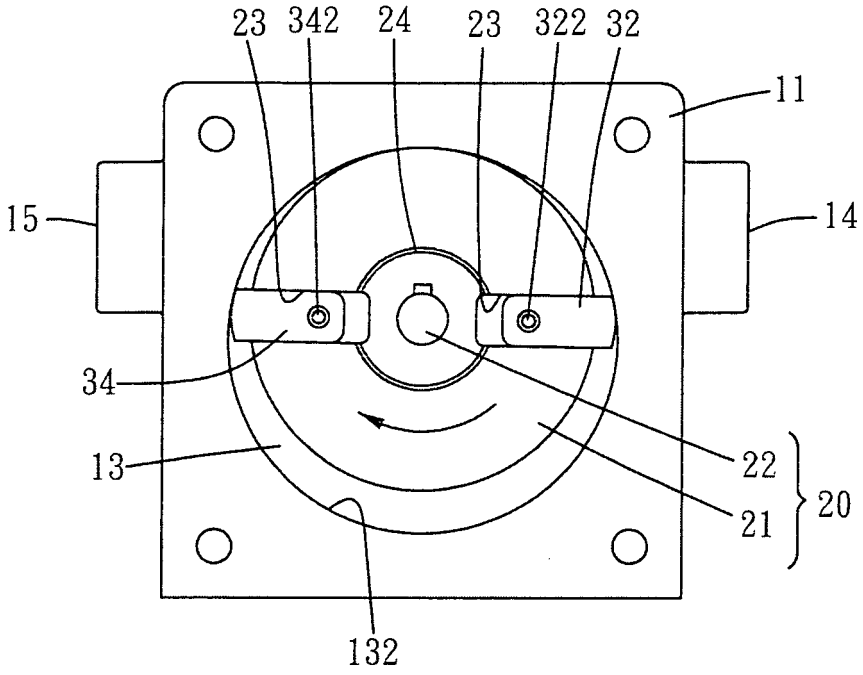
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FIG. 8

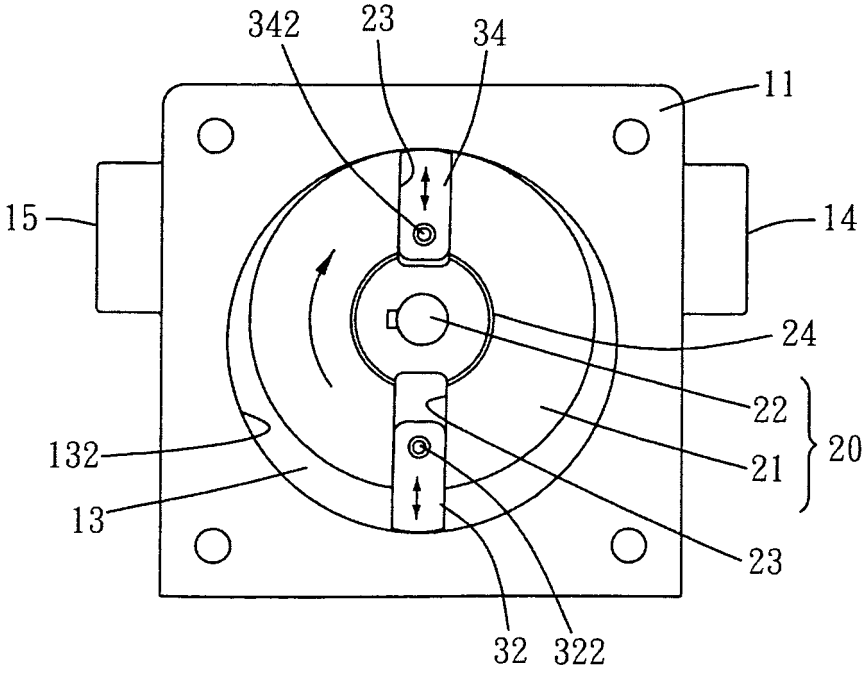
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FIG. 9

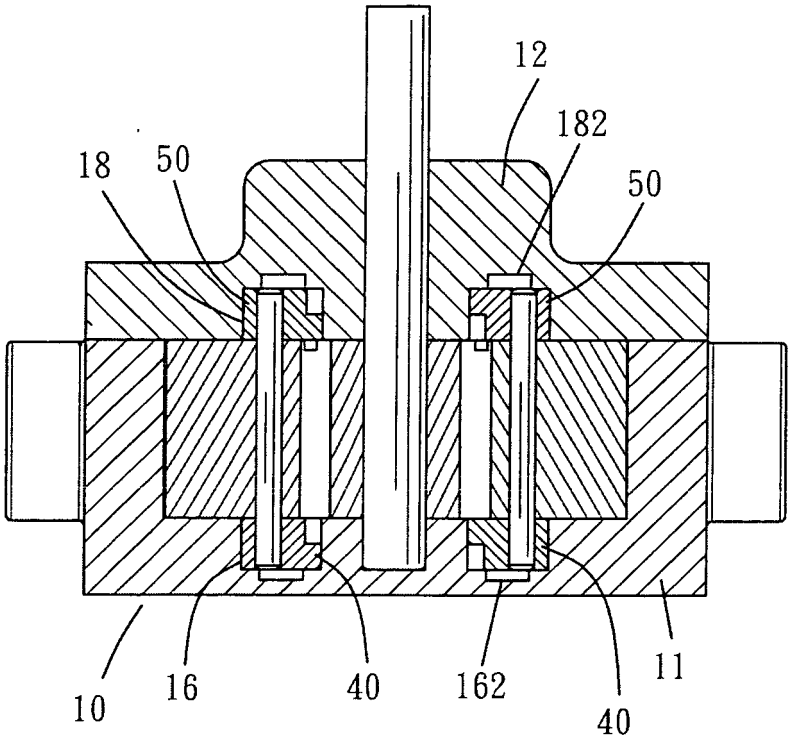

FIG. 10

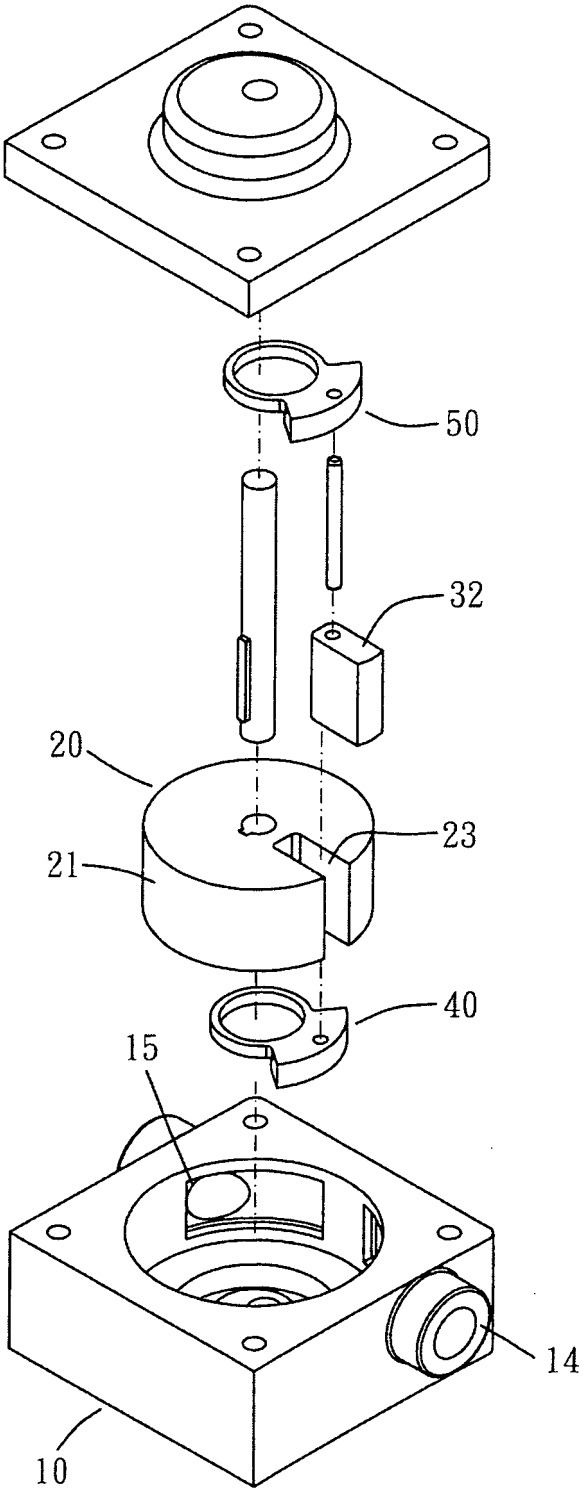

FIG. 11

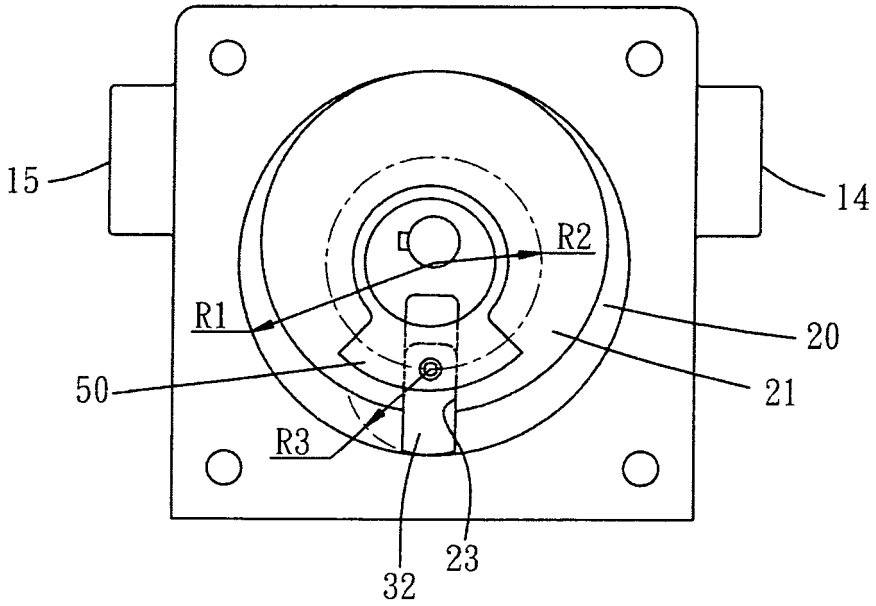

FIG. 12

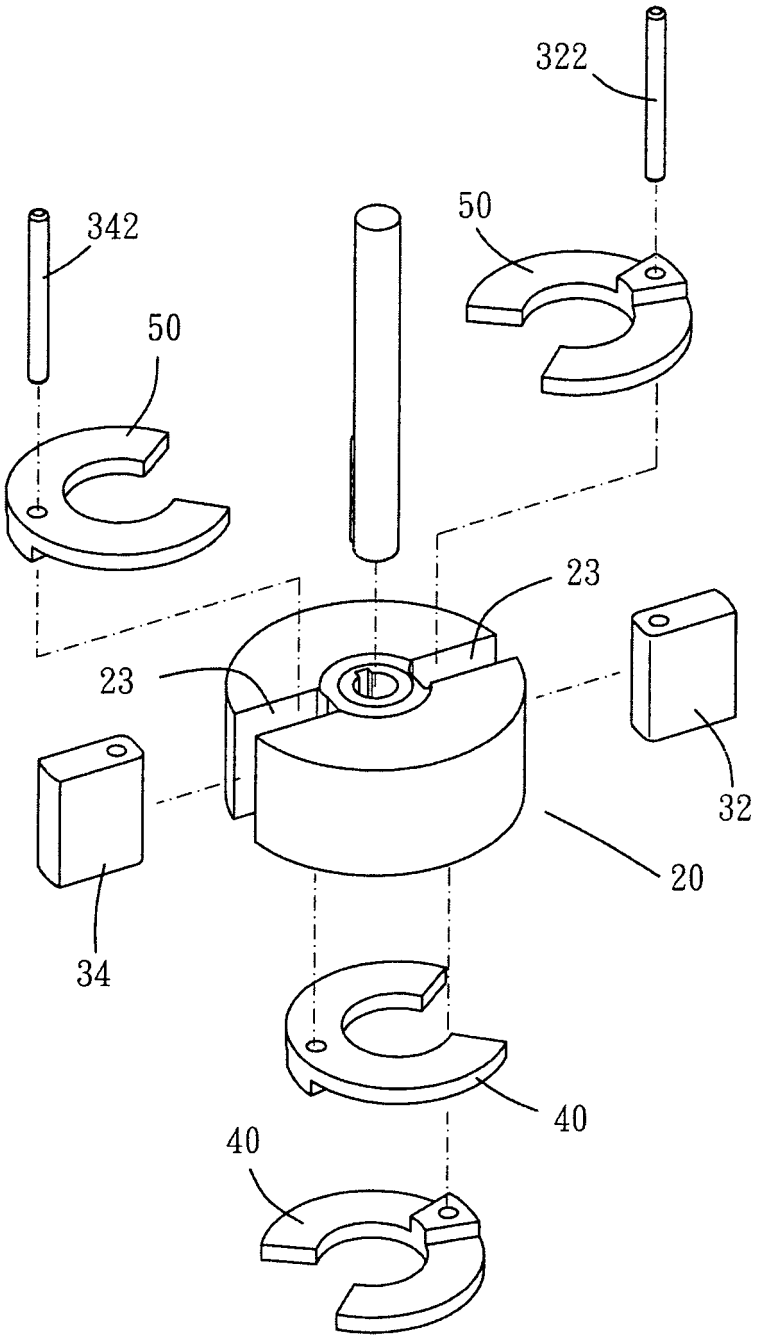

FIG. 13

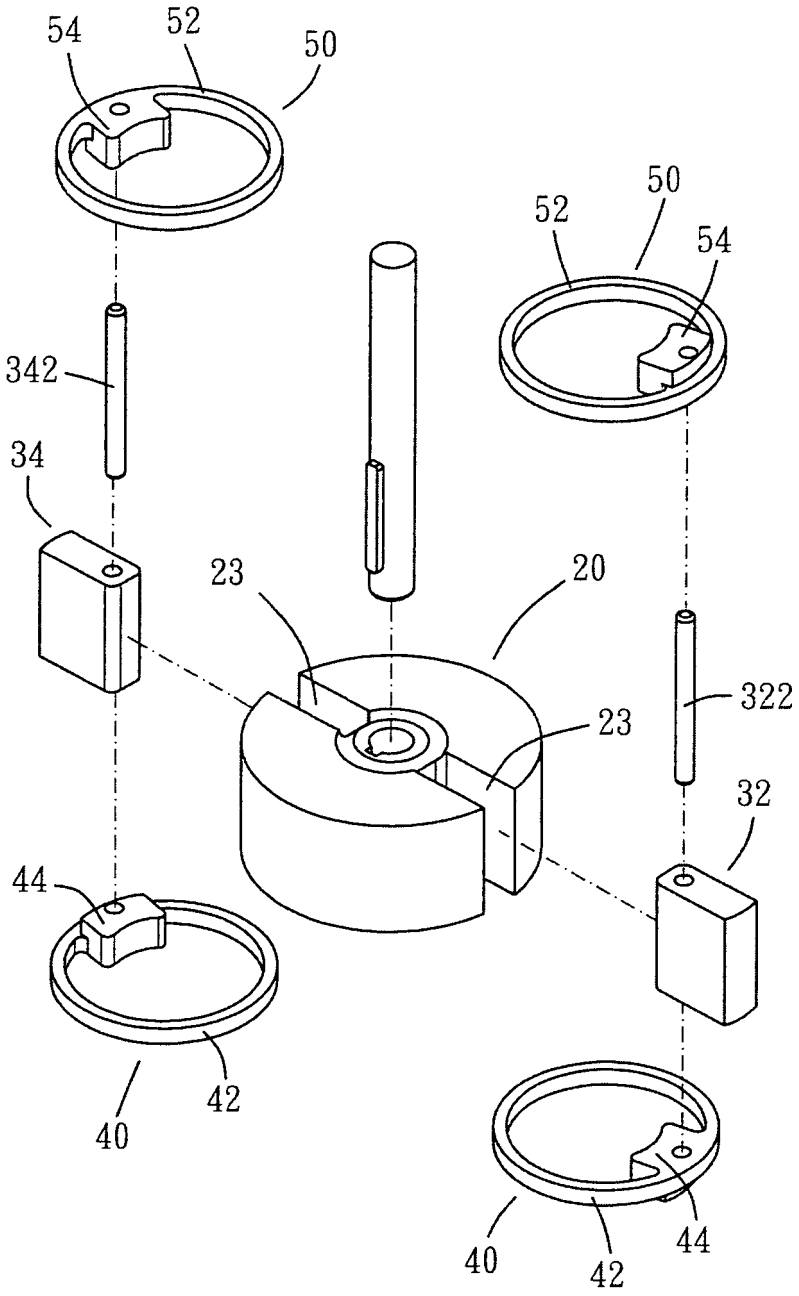

FIG. 14

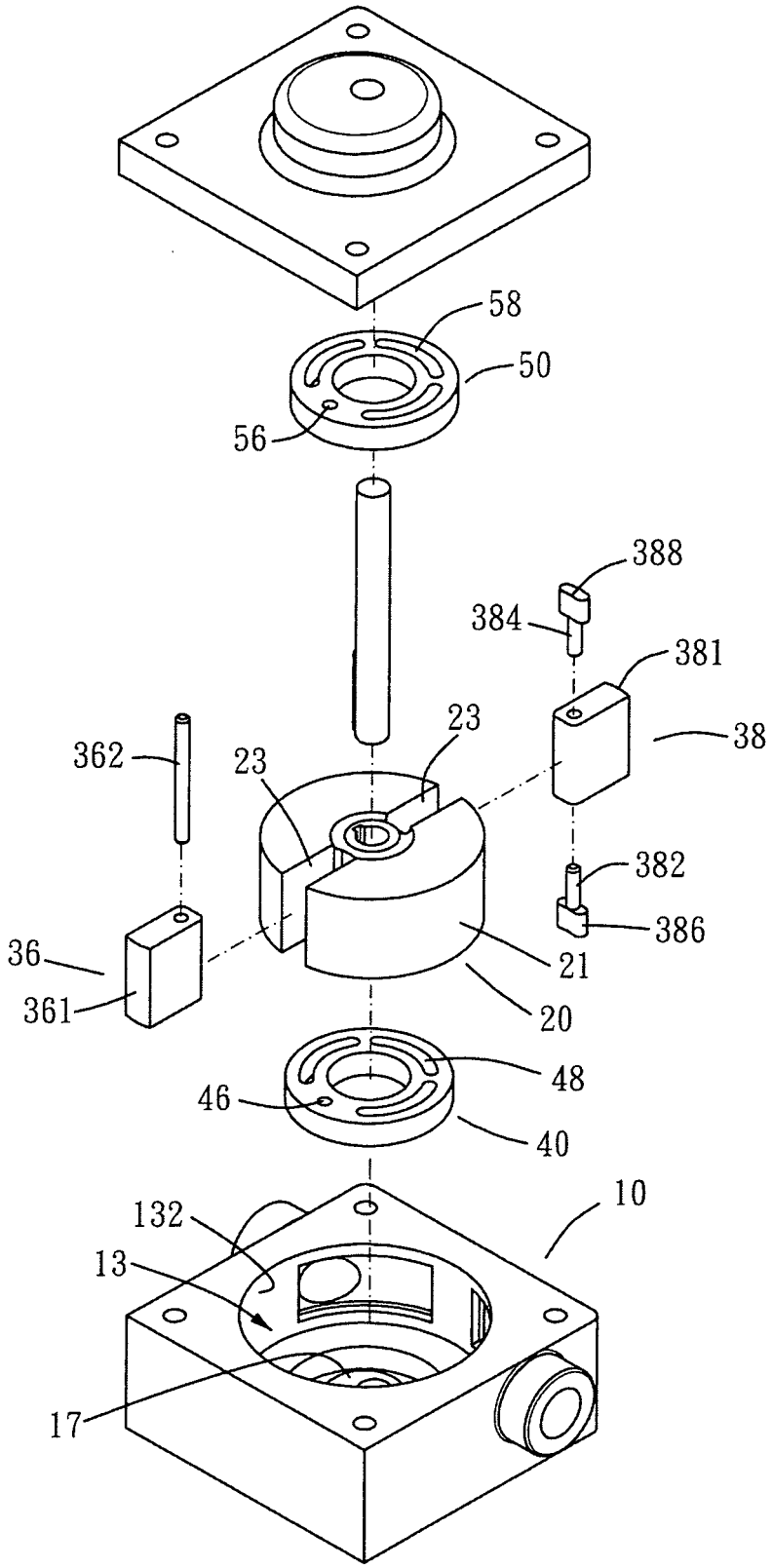
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FIG. 15

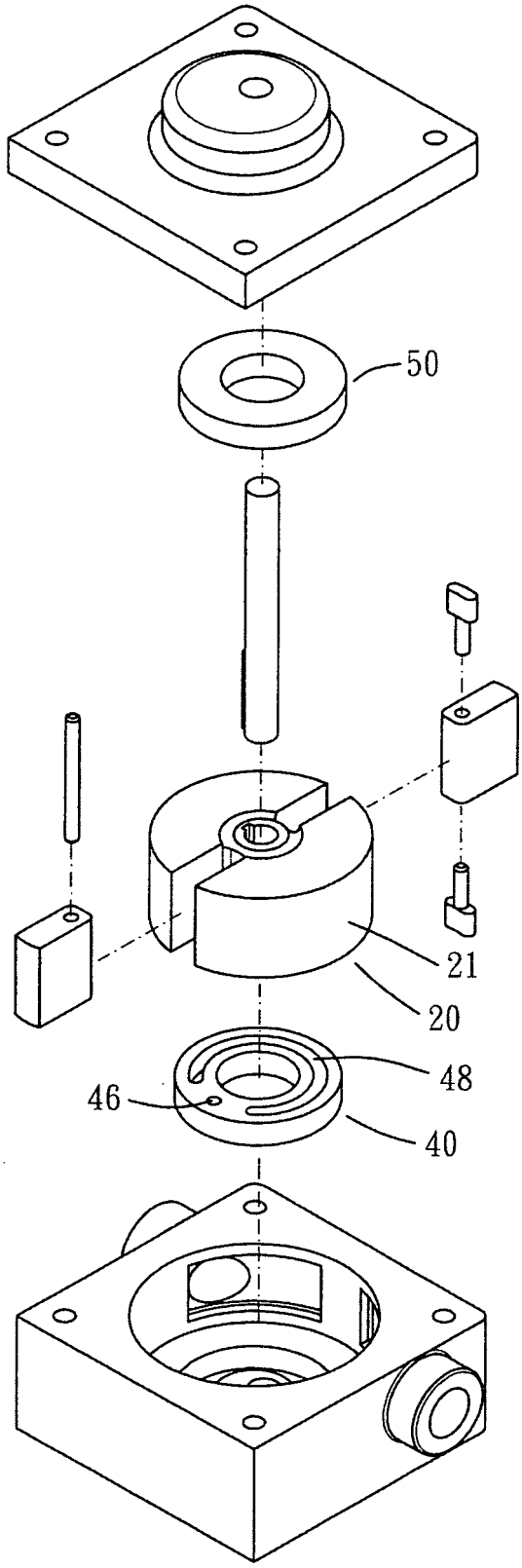

FIG. 16

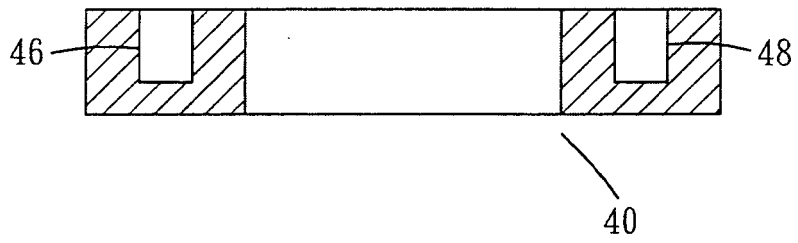

FIG. 17

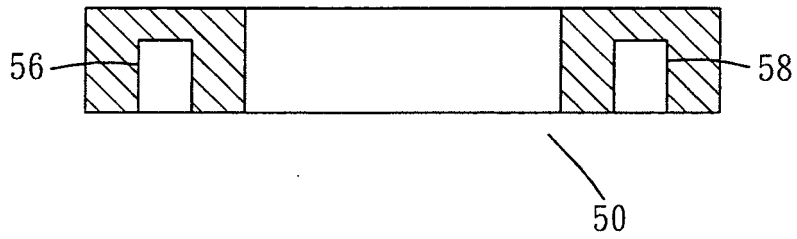

FIG. 18

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

- US 4212603 A **[0006]**
- US 5087183 A **[0006]**
- US 5160252 A **[0006]**
- US 5181843 A **[0006]**
- US 5558511 A **[0006]**
- US 6503071 B2 **[0007]**