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(54) WASHING MACHINE COMPRISING A WATER DISCHARGE ARRANGEMENT

WASCHMASCHINE MIT WASSERENTLADUNGSANORDNUNG

MACHINE À LAVER COMPRENANT UN DISPOSITIF D'ÉVACUATION D'EAU

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Description

TECHNICAL FIELD

[0001] The present disclosure relates to the field of washing machines, in particular to a drainage structure of a water-saving washing machine and a washing machine.

BACKGROUND

[0002] It is well known that the pulsator washing machine has the advantages of short washing time and high washing efficiency, and it is convenient to add clothes in the middle of a washing. However, the water consumption of the washing machine is relatively high. Generally, under the standard procedure, the water consumption of an 8 kg pulsator washing machine is about 180L for washing one times and rinsing two times. The water consumption is high, and it is not easy to clean the space between the inner and outer tubs, which results in easily breeding bacteria.

[0003] In order to solve the above problems, a structure of a holeless inner tub has been developed. During washing, there is no water between the inner tub and the outer tub. However, water discharging of the inner tub becomes a problem. One design is to apply a cycle of drain holes along the upper part of the inner tub and all the water inside the inner tub is discharged from the drain hole at the upper part of the inner tub by the centrifugal force of rotation. On one hand, in this design, the speed of drainage is slow; on the other hand, the dirt in the water, such as sediment, is difficult to discharge. Another design is to arrange a water containing chamber right below the inner tub, and the water containing chamber communicates with the inner tub. The upper edge of the water containing chamber is sealed with the lower edge of the inner tub, and a drainage hole is arranged at the lower part of the water containing chamber; the control of the drainage is achieved by controlling the opening and closing of the drainage hole. However, during the water discharging, the inner tub rotates at a high speed while the water containing chamber staying still. So the sealing between the two parts is not easy to achieve, and even if it is easily realized, the two parts relatively rotates in a high speed for a long time are also prone to wear and tear. One other design is to arrange the drainage holes at the inner tub bottom. During washing, the drainage holes at the inner tub bottom are blocked by a drain valve after the inner tub being fixed. During drainage, the drainage holes are open by the control of the drain valve. This kind of structure also needs to set a position fixed structure of the inner tub. High accuracy of positioning is demanded, and the structure is complicated. Meanwhile, the inner tub cannot rotate during washing, and it is unable to achieve dual power washing.

[0004] Document JPS5183178 U discloses a drainage structure for a water-saving washing machine, whereby said drainage structure comprises a plurality of holes arranged to encircle a central hole, the central hole is arranged at the centre of an inner tub bottom of the washing machine in which an inner tub shaft is arranged and a water flow passage is provided on the annular groove, said water flow passage communicating an inner part and an outer part of the inner tub, whereby the plurality of holes are provided with a sealing member configured to reciprocate to control an on-off state of the water flow passage.

[0005] The present disclosure is purposed in view of the above.

SUMMARY

[0006] The purpose of the present invention is to overcome the shortcomings of the prior art by providing a washing machine according to independent claim 1.

[0007] In order to achieve the object, the washing machine according to the present invention comprises a drainage structure, whereby said drainage structure comprises an annular groove arranged around a central hole, the central hole being arranged at the centre of an inner tub bottom of the washing machine in which an inner tub shaft is arranged, a water flow passage provided on the annular groove, the water flow passage communicating an inner part and an outer part of the inner tub, and a sealing member with which the annular groove is provided, the sealing member being configured to reciprocate to control an on-off state of the water flow passage, whereby the water flow passage is at least one opening which is provided on a bottom wall of the annular groove, at least a part of a driving member extends into said opening to drive the sealing member, and the driving member comprises a lever, a supporting point of the lever and a driving part of the lever; the supporting point of the lever is arranged at an inner bottom of the outer tub, and a middle part of the lever hinges with the supporting point; whereby one end of the lever extends into the opening and is located below the sealing member, and another end of the lever is connected with the driving part of the lever.

[0008] Preferably, the water flow passage further comprises several water outlets provided on the bottom wall of the annular groove and/or a side wall, away from the central hole, of the annular groove.

[0009] Preferably, the driving part comprises a traction motor, a traction rope and a positioning block of the traction rope; the traction motor is arranged at a lower part of an outer side wall of the outer tub, and the traction rope is connected to the traction motor and the lever; the positioning block is a hook-shaped raised part on an inner wall of the outer tub.

[0010] The upper part or an inner part of the sealing member is provided with a first mounting part of the elastic member, and a second mounting part of the elastic member is arranged on an upper side wall, near the center of the inner tub, of the annular groove.

[0011] Preferably, a second step is provided in the sealing member, and the second step is the first mounting part of the elastic member.

[0012] Preferably, the side wall, closing to the center of the inner tub, of the annular groove encloses the central hole for the inner tub, and an inner tub shaft is arranged in the central hole; the inner tub shaft and the side wall, closing to the center of the inner tub, of the annular groove are connected by a fasten member; a portion of the fasten member beyond an periphery of the side wall, near the center of the inner tub, of the annular groove forms the second mounting part of the elastic member.

[0013] A length of the sealing member is greater than or equal to a length of the side wall, closing to the center of the inner tub, of the annular groove, and a diameter at the second step is slightly larger than an outer diameter of the second mounting part. Or a third step is provided inside the sealing member; a diameter at the third step is greater than the diameter at the second step; the diameter at the third step is slightly greater than an outer diameter of the second mounting part.

[0014] By adopting the technical solution of the present disclosure, the following beneficial effects are brought: with the drainage structure of the present disclosure, it is only need to control the reciprocation motion of the sealing member to achieve the control of the drainage, so the control is simple. In addition, the sealing member is disposed in the inner annular groove at the inner tub bottom, and it is relatively fixed with the inner tub at the rotational direction. In this way, the wear of the sealing member is small, and the reliability is high; the accuracy demand of the positioning of the inner tub is lower, and the positioning structure and the control program of the inner tub is simplified. All the seals are the end face contacting seals, which are reliable.

[0015] The specific embodiments of the present disclosure are described in further detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016]

Fig.1: The structure diagram of the water-saving washing machine in the present disclosure;
Fig.2: The structure diagram of the water-saving washing machine (without outer shell) in the present disclosure;
Fig.3: The structure diagram at the closed state in the embodiment 1 of the present disclosure;
Fig.4: The structure diagram at the opening state in the embodiment 1 of the present disclosure;
Fig.5: The structure diagram at the closed state in the embodiment 3 of the present disclosure;
Fig.6: The structure diagram at the opening state in the embodiment 3 of the present disclosure;
Fig.7: The structure diagram at the closed state in the embodiment 4 of the present disclosure;
Fig.8: The structure diagram at the opening state in the embodiment 4 of the present disclosure.

[0017] Wherein: 1-central hole, 2-annular groove, 3-sealing member, 4-elastic member, 5-driving member, 6-first step, 7-inner tub bottom, 8-first side surface, 9-second side surface, 10-first annular gap, 11-second annular gap, 12-hole, 13-water outlet, 14-lever, 15-supporting point, 16-driving part, 17-traction motor, 18-traction rope, 19-positioning block, 20-fasten member, 21-second step, 23-third step, 24-outer shell, 25-cover seat, 26-top lid, 27-bottom feet, 28-outer tub, 29-inner tub, 30-drain outlet, 31-drain hose, 32-drainage hole, 33-inner tub shaft.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0018] As shown in Fig.1 and 2, in the drainage structure of the water-saving washing machine of the present disclosure, a central hole 1 is arranged at the inner tub bottom of the washing machine, and an annular groove 2 is arranged around the central hole 1; a water flow passage for communicating the inner part and the outer part of the inner tub is provided on the annular groove 2, and the annular groove 2 is provided with the sealing member 3 capable of reciprocating motion for controlling the on-off state of the water flow passage. During the washing, the sealing member 3 moves to a position to cut off the water flow passage, the washing water only exists in the inner tub. During water discharging, the sealing member 3 moves to another position, and the water flow passage opens, then the washing water is discharged through the water flow passage and the outer tub. As the control of the drainage is only needs to control the reciprocation of the sealing member, the control process is simple. In addition, the sealing member 3 is disposed in the inner annular groove 2 of the inner tub bottom 7, and it is relatively fixed with the inner tub at the rotational direction. In this way, the wear of the sealing member is small, and the reliability is high.

[0019] The upper part of the sealing member 3 is provided with the elastic member 4 for controlling the downward movement of the sealing member 3 to fit with the inner tub bottom and/or the bottom surface of the annular groove. The elastic member 4 is at the compressed state, at which the sealing member 3 is compressed to seal the water flow passage by the resilience of the elastic member 4. In addition, the lower part of the sealing member 3 is provided with a driving member 5 for controlling the upward movement of the sealing member 3 to separate from the inner tub bottom and/or the bottom surface of the annular groove. The driving member 5 drives the sealing member 3 to move upward under the traction of the traction motor 17, and the upward driving force is larger than the resilience of the elastic member 4, as a result, the water in the inner tub is drained. At the natural state, the resilience force of the elastic member 4 compresses

the sealing member 3 to seal the water flow passage. When drainage is needed, the driving member drives the sealing member to move upward to separate from the inner tub bottom and/or the annular groove, then the water flow passage opens and drainage is achieved.

[0020] The diameter of the outer circumference of the upper part of the sealing member 3 is larger than the diameter of that of the lower part, and a first step 6 is formed at the place where the diameter of the outer circumference of the sealing member is dramatically changed. At the closed state, the first step 6 contacts with the inner tub bottom 7 to form an annular end face contact seal and the end face of the bottom of the sealing member 3 contacts with the bottom surface of the annular groove to form the annular end face contact seal. At the open state, the first step 6 is disengaged from the inner tub bottom 7, and the end face of the sealing member bottom is disengaged from the bottom surface of the annular groove. At the seal state, the sealing member 3 and the inner tub bottom 7, the bottom end surface of the sealing member 3 and the bottom surface of the annular groove, both are annular end surface contact seal, and the sealing is reliable. The sealing member is an annular sleeve structure, and the upper part of the outer periphery of the sealing member is provided with a ring of bosses protruding outward. In the closed state, the lower surface of the boss contacts with the inner tub bottom to form a seal. The lower part of the sealing member is embedded in the annular groove at the inner tub bottom and is in a closed state, and the bottom of the seal contacts with the bottom surface of the annular groove to form an annular end surface contact seal to further ensure the sealing effect.

[0021] The upper part or the inner part of the sealing member 3 is provided with a first mounting part of the elastic member 4, and a second mounting part of the elastic member 4 is arranged on the upper side wall near the center of the inner tub of the annular groove 2. One end of the elastic member 4 is fixed to the second mounting part, and the second mounting part is a fixing structure for preventing the end of the elastic member 4 from moving; and the other end of the elastic member 4 is fixed to the first mounting part, and it moves along with the movement of the sealing member.

[0022] Preferably, the second step 21 is provided inside the sealing member 3, and the second step 21 is the first mounting part of the elastic member 3. The elastic member 4 is located inside the sealing member 3, and this arrangement saves the installation space and leaves more installation space for the pulsator without reducing the capacity of the inner tub. The second mounting part is a stop plate fixed to the side wall, closing to the center of the inner tub, of the annular groove. Preferably, the side wall, closing to the center of the inner tub, of the annular groove encloses to form a central hole 1 of the inner tub. The central hole is provided with an inner tub shaft and, the inner tub shaft and the side wall, closing to the center of the inner tub, of the annular groove are connected by a fasten member 20. A portion of the fasten member 20 beyond the periphery of the side wall, closing the center of the inner tub, of the annular groove forms the second mounting part of the elastic member. The fasten member 20 serves both as a connection of the inner tub shaft with the inner tub and as playing the role of mounting the elastic member. It makes all the used parts get full use and reduces the number of the parts. The side wall, closing to the inner tub centre, of the annular groove 2 is higher than the inner tub bottom to provide space for the reciprocating motion of the sealing member 3.

[0023] The bottom wall of the annular groove is provided with at least one opening 12. The driving member drives the sealing member 3 through the opening 12, and the water flow passage is the opening 12. Further, in order to increase the drainage speed, a plurality of water outlets 13 are evenly distributed on the bottom wall or the side wall far away from the center hole of the annular groove. The opening is a notch at the intersection of the bottom wall of the annular groove and the sidewall away from the center of the inner tub of the annular groove. The notch of the bottom wall of the annular groove ensures the lever can extend below the sealing member and the notch of the sidewall away from the center of the inner tub of the annular groove ensures that the lever can drive the sealing member 3 to move upward by a certain distance.

[0024] When the water need to be discharged, the inner tub is positioned to the opening 12 aligning with the lever 14 to control the drainage. Since the opening has a certain width in the circumferential direction which is much larger than the diameter of the lever, the positioning precision of the inner tub is less demanding. As long as the lever is in the opening 12, the control of the drainage can be achieved, so the structure and procedure of the positioning control is simplified.

[0025] The driving member comprises the lever 14, the supporting point 15 of the lever 14 and the driving part 16 of the lever. The supporting point 15 of the lever 14 is arranged at the bottom of the outer tub, and the middle part of the lever 14 hinge joints with the supporting point 15. One end of the lever 14 extends though the opening 12 and located below the sealing member 3, and the other end of the lever 14 is connected with the driving part 16. Preferably, the driving part 16 comprises the traction motor 17, the traction rope 18 and the positioning block 19 for the traction rope 18. The traction motor 17 is arranged on the lower part of the outer side wall of the outer tub, thus it avoids occupying the space at the inner tub bottom and leaves more installation space for the inner tub. The traction rope 18 is connected to the traction motor 17 and the lever 14. The positioning block 19 is a hook-shaped raised part on the inner wall of the outer tub. The hook-shaped raised part locates the traction rope along the inner wall of the outer tub to avoid interference with the rotation of the inner tub.

[0026] Preferably, the bottom wall of the annular

groove is uniformly provided with two or more openings 12, and the ends of the levers 14 are provided with branches, each of which extends into the openings 12 to drive the sealing member. One traction motor drives one lever, and multiple branches of an end of one lever evenly drive the multiple parts of the sealing member.

[0027] The side surface near the center of the inner tub in the two side surfaces of the annular groove 2 is the first side surface 8, and the side surface away from the center of the inner tub is the second side surface 9. The part of the sealing member 3 that protruding into the annular groove 2 is at a distance away from the second side surface 9 or the first side surface 8, forming an annular gap. The water flows into the annular groove 2 through the annular gap and is discharged through the water flow passage.

Embodiment 1

[0028] As shown in Fig. 3 and Fig. 4, in this embodiment, the second side surface 9 have a certain distance away from the outer periphery of the lower part of the sealing member 3, and a first annular gap 10 is formed between the second side surface 9 and the outer periphery of the lower part of the sealing member. The first side surface 8 is sealed against the inner periphery of the lower part of the sealing member. The sealing member moves upward and separates from the inner tub bottom and/or the bottom surface of the annular groove, then the water flows into the annular groove 2 through the first annular gap 10 and is discharged through the water flow passage.

Embodiment 2

[0029] In the present embodiment, the first side surface 8 has a certain distance away from the inner periphery of the lower part of the sealing member. A second annular gap 11 is formed between the first side surface 8 and the inner periphery of the lower part of the sealing member. The second side surface 9 is in contact with the outer periphery of the lower part of the sealing member and seals. The sealing member moves upward and separates from the inner tub bottom and/or the bottom surface of the annular groove, then the water flows into the annular groove through the second annular gap 11 and is discharged through the water flow passage.

Embodiment 3

[0030] As shown in Fig. 5 and Fig. 6, in this embodiment, the second side surface 9 is spaced from the outer periphery of the lower part of the sealing member, forming a first annular gap 10 between the second side surface 9 and the outer periphery of the lower part of the sealing member. The first side surface 8 is spaced from the inner periphery of the lower part of the sealing member, and a second annular gap 11 is formed between the first side surface 8 and the inner periphery of the lower part of the sealing member. After the sealing member moves upward and separates from the inner tub bottom and/or the bottom surface of the annular groove, the water flows into the annular groove through the first annular gap 10 and the second annular gap 11 and then is discharged through the water flow passage. The arrangement of two annular gaps accelerates the drainage speed. As gaps are provided between the sealing member and both sides of the annular groove, the sealing member needs to be positioned circumferentially. Thus, the length of the sealing member is greater than or equal to the length of the side wall, closing to the center of the inner tub, of the annular groove, and the diameter at the second step 21 is slightly larger than the outer diameter of the second mounting part, or the third step 23 is provided inside the sealing member. The diameter at the third step 23 is greater than the diameter at the second step 21. The diameter at the third step 23 is slightly greater than the outer diameter of the second mounting part. The sealing member is circumferentially positioned by the contact between the second mounting part and the inner part of the sealing member.

Embodiment 4

[0031] As shown in Fig. 7 and Fig. 8, in the present embodiment, the second side surface 9 is from the bottom to the top, and the outer periphery of the lower part of the sealing member 3 is inclined outward from the bottom to the top. The angle a between the second side surface and the horizontal plane is larger than the angle b between the outer periphery of the lower part of the sealing member and the horizontal plane. The first side surface 8 is in contact with the inner periphery of the lower part of the sealing member and seals. That is, the lower part of the outer periphery of the sealing member 3 is provided with a taper, and the second side surface of the annular groove is provided with a taper. In addition, the taper of the second side surface is greater than the taper of the lower part of the outer periphery of the sealing member. The provided taper has a good effect on direction guide for the downward movement of the sealing member.

Embodiment 5

[0032] In the present embodiment, a washing machine with the above drainage structure comprises an outer shell 24, a cover seat 25, a top lid 26, bottom feet 27, an outer tub 28, and an inner tub 29. The outer tub 28 is only used for temporarily storing a part of the washing water when the washing machine is draining, and a lower part of the outer tub is provided with a drain outlet 30 for connecting the drain hose 31 to discharge the washing water or the rinsing water out of the washing machine. A hole is provided at the center of the bottom of the outer tub 28 for placing the bearings and the sealing device,

and the inner tub shaft 33 passes through the hole. The two ends communicate with the drive motor and the inner tub respectively. Hence, the inner tub is driven to rotate by the motor for washing clothes or drying clothes with high-speed spinning. A ring of drainage holes 32 is arranged on the upper part of the inner tub 29. When excessive amount of water flows into the inner tub, the water flows through the drainage hole 32 to the outer tub, and then flows out from the washing machine. When the wet laundry is dried at a high speed spin, the water flows upward and can pass through the drainage hole 32 to the outer tub, and then flows out from the washing machine.

[0033] The lower part and the middle of the inner tub 29 are ensured without water leakage hole. Under the resilience of the elastic member, the first step of the sealing member is in contact with the inner tub bottom and the bottom of the sealing member is in contact with the bottom of the annular groove, then the inner tub bottom is sealed. And the washing starts, the water inlet valve opens and the tap water enters the inner tub. After water entering is completed, the inner tub rotates and washes clothes. When drainage is required, the traction motor pulls the traction rope, and then the traction rope pulls the levers, the lever drives the sealing member to move upward. The sealing member moves upward, and the first step of the sealing member is disengaged from the inner tub bottom and the bottom of the sealing member is disengaged from the bottom of the annular groove. The water flows through the annular gap into the annular groove, and then discharged through the water passage from the inner tub. After drainage, the traction motor is de-energized, and the sealing member is moved downward by the resilience of the elastic member. The first step of the sealing member is in contact with the inner tub bottom, and the bottom of the sealing member is in contact with the bottom of the annular groove, thus the inner tub bottom is sealed.

[0034] The above descriptions are merely preferred embodiments of the present disclosure, and it should be noted that various modifications and improvements can be made by those skilled in the art without departing from the principle of the present disclosure, and then it should also be regarded as inside the scope of the present disclosure.

Claims

1. A washing machine, comprising a drainage structure, whereby the drainage structure comprises:

   an annular groove (2) arranged around a central hole (1), the central hole (1) being arranged at the center of an inner tub bottom (7) of the washing machine in which an inner tub shaft (33) is arranged,
   a water flow passage (12) provided on the annular groove (2), the water flow passage (12) communicating an inner part and an outer part of the inner tub (29), and
   a sealing member (3) with which the annular groove (2) is provided, the sealing member (3) being configured to reciprocate to control an on-off state of the water flow passage (12),
   whereby the water flow passage (12) is at least one opening which is provided on a bottom wall of the annular groove (2),
   at least a part of a driving member extends into said opening to drive the sealing member (3),
   and the driving member comprises a lever (14), a supporting point (15) of the lever (14) and a driving part of the lever (14); wherein
   the supporting point (15) of the lever (14) is arranged at an inner bottom of the outer tub (28), and a middle part of the lever (14) hinges with the supporting point (15); whereby one end of the lever (14) extends into the opening and is located below the sealing member (3), and another end of the lever (14) is connected with the driving part of the lever (14).

2. The washing machine according to claim 1, wherein an upper part of the sealing member (3) is provided with an elastic member (4) for controlling a downward movement of the sealing member (3) to contact with the inner tub bottom (7) and/or a bottom surface of the annular groove (2),
   and a lower part of the sealing member (3) is provided with a driving member for controlling an upward movement of the sealing member (3) to separate from the inner tub bottom and/or the bottom surface of the annular groove (2).

3. The washing machine according to claim 1 or 2, wherein a diameter of an upper part is larger than a diameter of a lower part of an outer periphery of the sealing member (3), and a first step (6) is formed at a place where a diameter of the outer periphery is dramatically changed, the lower part of the sealing member (3) is located in the annular groove (2);

   at a closed state, the first step (6) is in contact with the inner tub bottom (7), and an end face of a bottom of the sealing member (3) is in contact with the bottom surface of the annular groove (2);
   at an open state, the first step (6) is disengaged from the inner tub bottom (7), and the end face of the bottom of the sealing member (3) is disengaged from the bottom surface of the annular groove (2).

4. The washing machine according to any one of claims from 1 to 3, wherein one side surface, near a center of the inner tub (29), of two side surfaces of the an-

nular groove (2) is a first side surface (8),

and one side surface away from the center of the inner tub (29) is a second side surface (9), a distance between an outer periphery of a lower part of the sealing member (3) and the second side surface (9), and/or between an inner periphery of the lower part of the sealing member (3) and the first side surface (8) forms an annular gap.

5. The washing machine according to any one of claims from 1 to 4, wherein one side surface, near the center of the inner tub (29), in the two side surfaces of the annular groove (2) is the first side surface (8), and one side surface away from the center of the inner tub is the second side surface (9);

the second side surface (9) is inclined outward from bottom to top, and the outer periphery of the lower part of the sealing member (3) is inclined outward from bottom to top;
an angle between the second side surface (9) and a horizontal surface is larger than an angle between the outer periphery of the lower part of the sealing member (3) and the horizontal plane.

6. The washing machine according to any one of claims from 1 to 5, wherein the water flow passage (12) further comprises several water outlets provided on the bottom wall of the annular groove (2) and/or a side wall, away from the central hole (1), of the annular groove (2).

7. The washing machine according to claim 6, wherein the driving part comprises a traction motor, a traction rope and a positioning block of the traction rope; the traction motor is arranged at a lower part of an outer side wall of the outer tub (28), and the traction rope is connected to the traction motor and the lever (14); the positioning block is a hook-shaped raised part on an inner wall of the outer tub (28).

8. The washing machine according to any one of claims from 1 to 7, wherein the upper part or an inner part of the sealing member (3) is provided with a first mounting part of the elastic member (4), and a second mounting part of the elastic member (4) is arranged on an upper side wall, near the center of the inner tub, of the annular groove (2);

preferably, a second step is provided in the sealing member (3), and the second step is the first mounting part of the elastic member (4);
preferably, the side wall, closing to the center of the inner tub (29), of the annular groove (2) encloses the central hole (1) for the inner tub (29); the inner tub shaft (33) and the side wall, closing to the center of the inner tub (29), of the annular groove (2) are connected by a fasten member (20); a portion of the fasten member (20) beyond a periphery of the side wall, near the center of the inner tub (29), of the annular groove (2) forms the second mounting part of the elastic member (4).

9. The washing machine according to claim 8, wherein a length of the sealing member (3) is greater than or equal to a length of the side wall, closing to the center of the inner tub (29), of the annular groove (2),

and a diameter at the second step is slightly larger than an outer diameter of the second mounting part,
or a third step is provided inside the sealing member (3); a diameter at the third step is greater than the diameter at the second step; the diameter at the third step is slightly greater than an outer diameter of the second mounting part.

Patentansprüche

1. Waschmaschine, umfassend eine Entwässerungsstruktur, wobei die Entwässerungsstruktur umfasst:

eine ringförmige Rinne (2), angeordnet um ein mittiges Loch (1) herum, wobei das mittige Loch (1) in der Mitte eines Bodens (7) eines inneren Troges der Waschmaschine angeordnet ist, in dem eine Welle (33) des inneren Troges angeordnet ist,
einen Wasserströmungskanal (12), vorgesehen auf der ringförmigen Rinne (2), wobei der Wasserströmungskanal (12) einen inneren Teil und einen äußeren Teil des inneren Troges (29) miteinander in Verbindung bringt, und
ein Abdichtglied (3), mit dem die ringförmige Rinne (2) versehen ist, wobei das Abdichtglied (3) dazu ausgestaltet ist, sich hin- und herzubewegen, um einen Ein-/Aus-Zustand des Wasserströmungskanals (12) zu steuern,
wobei
der Wasserströmungskanal (12) mindestens eine Öffnung ist, die auf einer Bodenwand der ringförmigen Rinne (2) vorgesehen ist,
zumindest ein Teil eines Antriebsgliedes sich in die Öffnung hineinerstreckt, um das Abdichtglied (3) anzutreiben,
und das Antriebsglied einen Hebel (14), einen Abstützpunkt (15) des Hebels (14) und ein Antriebsteil des Hebels (14) umfasst; wobei
der Abstützpunkt (15) des Hebels (14) an einem inneren Boden des äußeren Troges (28) angeordnet ist und ein mittlerer Teil des Hebels (14) gelenkig mit dem Abstützpunkt (15) verbunden

ist;
wobei ein Ende des Hebels (14) sich in die Öffnung hineinerstreckt und sich unterhalb des Abdichtgliedes (3) befindet und ein anderes Ende des Hebels (14) mit dem Antriebsteil des Hebels (14) verbunden ist.

2. Waschmaschine nach Anspruch 1, wobei ein oberer Teil des Abdichtgliedes (3) mit einem elastischen Glied (4) zum Steuern einer Abwärtsbewegung des Abdichtgliedes (3) versehen ist, um mit dem Boden (7) des inneren Troges und/oder einer Bodenfläche der ringförmigen Rinne (2) in Kontakt zu kommen,
und ein unterer Teil des Abdichtgliedes (3) mit einem Antriebsglied zum Steuern einer Aufwärtsbewegung des Abdichtgliedes (3) versehen ist, um sich von dem Boden des inneren Troges und/oder der Bodenfläche der ringförmigen Rinne (2) zu lösen.

3. Waschmaschine nach Anspruch 1 oder 2, wobei ein Durchmesser eines oberen Teiles größer als ein Durchmesser eines unteren Teiles eines Außenumfanges des Abdichtgliedes (3) ist und eine erste Stufe (6) an einer Stelle ausgebildet ist, an der ein Durchmesser des Außenumfanges drastisch verändert ist, der untere Teil des Abdichtgliedes (3) sich in der ringförmigen Rinne (2) befindet;

in einem geschlossenen Zustand die erste Stufe (6) in Kontakt mit dem Boden (7) des inneren Troges steht und eine Stirnfläche eines Bodens des Abdichtgliedes (3) in Kontakt mit der Bodenfläche der ringförmigen Rinne (2) steht;
in einem geöffneten Zustand die erste Stufe (6) von dem Boden (7) des inneren Troges gelöst ist und die Stirnfläche des Bodens des Abdichtgliedes (3) von der Bodenfläche der ringförmigen Rinne (2) gelöst ist.

4. Waschmaschine nach einem der Ansprüche 1 bis 3, wobei eine Seitenfläche, nahe einer Mitte des inneren Troges (29), von zwei Seitenflächen der ringförmigen Rinne (2) eine erste Seitenfläche (8) ist und eine Seitenfläche, abseits der Mitte des inneren Troges (29), eine zweite Seitenfläche (9) ist,
ein Abstand zwischen einem Außenumfang eines unteren Teiles des Abdichtgliedes (3) und der zweiten Seitenfläche (9) und/oder zwischen einem Innenumfang des unteren Teiles des Abdichtgliedes (3) und der ersten Seitenfläche (8) eine ringförmige Lücke bildet.

5. Waschmaschine nach einem der Ansprüche 1 bis 4, wobei eine Seitenfläche, nahe der Mitte des inneren Troges (29), in den zwei Seitenflächen der ringförmigen Rinne (2) die erste Seitenfläche (8) ist und eine Seitenfläche, abseits der Mitte des inneren Troges, die zweite Seitenfläche (9) ist;
die zweite Seitenfläche (9) von unten nach oben nach außen geneigt ist und der Außenumfang des unteren Teiles des Abdichtgliedes (3) von unten nach oben nach außen geneigt ist;
ein Winkel zwischen der zweiten Seitenfläche (9) und einer horizontalen Oberfläche größer als ein Winkel zwischen dem Außenumfang des unteren Teiles des Abdichtgliedes (3) und der Horizontalebene ist.

6. Waschmaschine nach einem der Ansprüche 1 bis 5, wobei der Wasserströmungskanal (12) ferner mehrere Wasserauslässe, vorgesehen auf der Bodenwand der ringförmigen Rinne (2) und/oder einer Seitenwand, abseits des mittigen Loches (1), der ringförmigen Rinne (2) umfasst.

7. Waschmaschine nach Anspruch 6, wobei das Antriebsteil einen Zugmotor, ein Zugseil und einen Positionierungsblock des Zugseiles umfasst; der Zugmotor an einem unteren Teil einer äußeren Seitenwand des äußeren Troges (28) angeordnet ist und das Zugseil mit dem Zugmotor und dem Hebel (14) verbunden ist;
der Positionierungsblock ein hakenförmiges erhöhtes Teil auf einer Innenwand des äußeren Troges (28) ist.

8. Waschmaschine nach einem der Ansprüche 1 bis 7, wobei der obere Teil oder ein innerer Teil des Abdichtgliedes (3) mit einem ersten Montageteil des elastischen Gliedes (4) versehen ist und ein zweites Montageteil des elastischen Gliedes (4) auf einer oberen Seitenwand, nahe der Mitte des inneren Troges, der ringförmigen Rinne (2) angeordnet ist;

vorzugsweise eine zweite Stufe in dem Abdichtglied (3) vorgesehen ist und die zweite Stufe das erste Montageteil des elastischen Gliedes (4) ist;
vorzugsweise die Seitenwand, nahe der Mitte des inneren Troges (29), der ringförmigen Rinne (2) das mittige Loch (1) für den inneren Trog (29) umschließt;
die Welle (33) des inneren Troges und die Seitenwand, nahe der Mitte des inneren Troges (29), der ringförmigen Rinne (2) durch ein Befestigungsglied (20) verbunden sind;
ein Abschnitt des Befestigungsgliedes (20) jenseits eines Umfanges der Seitenwand, nahe der Mitte des inneren Troges (29), der ringförmigen Rinne (2) das zweite Montageteil des elastischen Gliedes (4) bildet.

9. Waschmaschine nach Anspruch 8, wobei eine Länge des Abdichtgliedes (3) größer als eine oder gleich einer Länge der Seitenwand, nahe der Mitte des inneren Troges (29), der ringförmigen Rinne (2) ist

und ein Durchmesser an der zweiten Stufe geringfügig größer als ein Außendurchmesser des zweiten Montageteiles ist
oder eine dritte Stufe im Inneren des Abdichtgliedes (3) vorgesehen ist; ein Durchmesser an der dritten Stufe größer als der Durchmesser an der zweiten Stufe ist; der Durchmesser an der dritten Stufe geringfügig größer als ein Außendurchmesser des zweiten Montageteiles ist.

Revendications

1. Machine à laver, comprenant une structure d'évacuation, la structure d'évacuation comprenant :

une rainure annulaire (2) agencée autour d'un orifice central (1), l'orifice central (1) étant agencé au centre d'un fond de bac intérieur (7) de la machine à laver dans lequel un arbre (33) de bac intérieur est agencé,
un passage de courant d'eau (12) prévu sur la rainure annulaire (2), le passage de courant d'eau (12) faisant communiquer une partie intérieure et une partie extérieure du bac intérieur (29), et
un élément d'étanchéité (3) dont la rainure annulaire (2) est munie, l'élément d'étanchéité (3) étant configuré pour aller et venir afin de contrôler un état de marche-arrêt du passage de courant d'eau (12),
le passage de courant d'eau (12) étant au moins une ouverture qui est prévue sur une paroi de fond de la rainure annulaire (2),
au moins une partie d'un élément d'entraînement s'étendant dans ladite ouverture afin d'entraîner l'élément d'étanchéité (3),
et l'élément d'entraînement comprenant un levier (14), un point de support (15) du levier (14) et une partie d'entraînement du levier (14) ;
le point de support (15) du levier (14) étant agencé au niveau d'un fond intérieur du bac extérieur (28), et une partie centrale du levier (14) étant articulée avec le point de support (15) ;
une extrémité du levier (14) s'étendant dans l'ouverture et étant située en dessous de l'élément d'étanchéité (3), et une autre extrémité du levier (14) étant connectée à la partie d'entraînement du levier (14).

2. Machine à laver selon la revendication 1, dans laquelle une partie supérieure de l'élément d'étanchéité (3) est munie d'un élément élastique (4) pour contrôler un mouvement vers le bas de l'élément d'étanchéité (3) afin de venir en contact avec le fond de bac intérieur (7) et/ou une surface de fond de la rainure annulaire (2),
et une partie inférieure de l'élément d'étanchéité (3) est munie d'un élément d'entraînement pour contrôler un mouvement vers le haut de l'élément d'étanchéité (3) afin de se séparer du fond de bac intérieur et/ou de la surface de fond de la rainure annulaire (2).

3. Machine à laver selon la revendication 1 ou 2, dans laquelle un diamètre d'une partie supérieure est plus grand qu'un diamètre d'une partie inférieure d'une périphérie extérieure de l'élément d'étanchéité (3), et un premier gradin (6) est formé à un emplacement où un diamètre de la périphérie extérieure est radicalement changé,

la partie inférieure de l'élément d'étanchéité (3) est située dans la rainure annulaire (2) ;
dans un état fermé, le premier gradin (6) est en contact avec le fond de bac intérieur (7), et une face d'extrémité d'un fond de l'élément d'étanchéité (3) est en contact avec la surface de fond de la rainure annulaire (2) ;
dans un état ouvert, le premier gradin (6) est désengagé du fond de bac intérieur (7), et la face d'extrémité du fond de l'élément d'étanchéité (3) est désengagée de la surface de fond de la rainure annulaire (2).

4. Machine à laver selon l'une quelconque des revendications 1 à 3, dans laquelle une surface latérale, proche d'un centre du bac intérieur (29), parmi deux surfaces latérales de la rainure annulaire (2) est une première surface latérale (8), et une surface latérale éloignée du centre du bac intérieur (29) est une deuxième surface latérale (9),
une distance entre une périphérie extérieure d'une partie inférieure de l'élément d'étanchéité (3) et la deuxième surface latérale (9), et/ou entre une périphérie intérieure de la partie inférieure de l'élément d'étanchéité (3) et la première surface latérale (8) forme un espace annulaire.

5. Machine à laver selon l'une quelconque des revendications 1 à 4, dans laquelle une surface latérale, proche d'un centre du bac intérieur (29), parmi les deux surfaces latérales de la rainure annulaire (2) est la première surface latérale (8), et une surface latérale éloignée du centre du bac intérieur est la deuxième surface latérale (9) ;

la deuxième surface latérale (9) est inclinée vers l'extérieur du fond vers le haut, et la périphérie extérieure de la partie inférieure de l'élément d'étanchéité (3) est inclinée vers l'extérieur du fond vers le haut ;
un angle entre la deuxième surface latérale (9) et une surface horizontale est plus grand qu'un angle entre la périphérie extérieure de la partie inférieure de l'élément d'étanchéité (3) et le plan horizontal.

6. Machine à laver selon l'une quelconque des revendications 1 à 5, dans laquelle le passage de courant d'eau (12) comprend en outre plusieurs sorties d'eau prévues sur la paroi de fond de la rainure annulaire (2) et/ou une paroi latérale, éloignée de l'orifice central (1), de la rainure annulaire (2).

7. Machine à laver selon la revendication 6, dans laquelle la partie d'entraînement comprend un moteur de traction, une corde de traction et un bloc de positionnement de la corde de traction ; le moteur de traction est agencé au niveau d'une partie inférieure d'une paroi latérale extérieure du bac extérieur (28), et la corde de traction est connectée au moteur de traction et au levier (14) ;
le bloc de positionnement est une partie surélevée en forme de crochet sur une paroi intérieure du bac extérieur (28).

8. Machine à laver selon l'une quelconque des revendications 1 à 7, dans laquelle la partie supérieure ou une partie intérieure de l'élément d'étanchéité (3) est munie d'une première partie de montage de l'élément élastique (4), et une deuxième partie de montage de l'élément élastique (4) est agencée sur une paroi latérale supérieure, proche du centre du bac intérieur, de la rainure annulaire (2) ;

de préférence, un deuxième gradin est prévu dans l'élément d'étanchéité (3), et le deuxième gradin est la première partie de montage de l'élément élastique (4) ;
de préférence, la paroi latérale, proche du centre du bac intérieur (29), de la rainure annulaire (2) entoure l'orifice central (1) pour le bac intérieur (29) ;
l'arbre (33) de bac intérieur et la paroi latérale, proche du centre du bac intérieur (29), de la rainure annulaire (2) sont connectés par un élément de fixation (20) ;
une portion de l'élément de fixation (20) au-delà d'une périphérie de la paroi latérale, proche du centre du bac intérieur (29), de la rainure annulaire (2) forme la deuxième partie de montage de l'élément élastique (4).

9. Machine à laver selon la revendication 8, dans laquelle une longueur de l'élément d'étanchéité (3) est supérieure ou égale à une longueur de la paroi latérale, proche du centre du bac intérieur (29), de la rainure annulaire (2),

et un diamètre au niveau du deuxième gradin est légèrement plus grand qu'un diamètre extérieur de la deuxième partie de montage,
ou un troisième gradin est prévu à l'intérieur de l'élément d'étanchéité (3) ; un diamètre au niveau du troisième gradin est supérieur au diamètre au niveau du deuxième gradin ; le diamètre au niveau du troisième gradin est légèrement supérieur à un diamètre extérieur de la deuxième partie de montage.

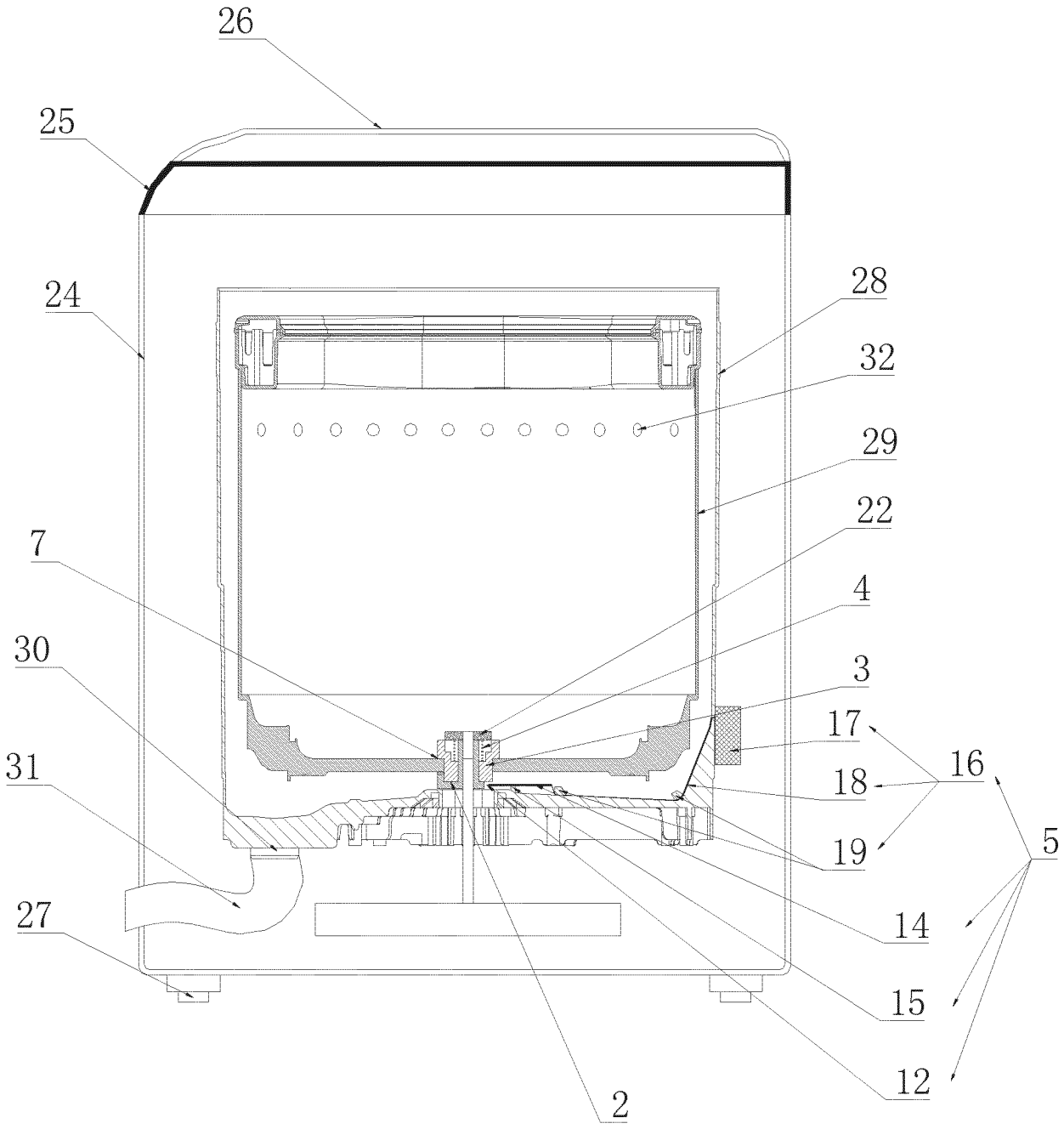

Fig. 1

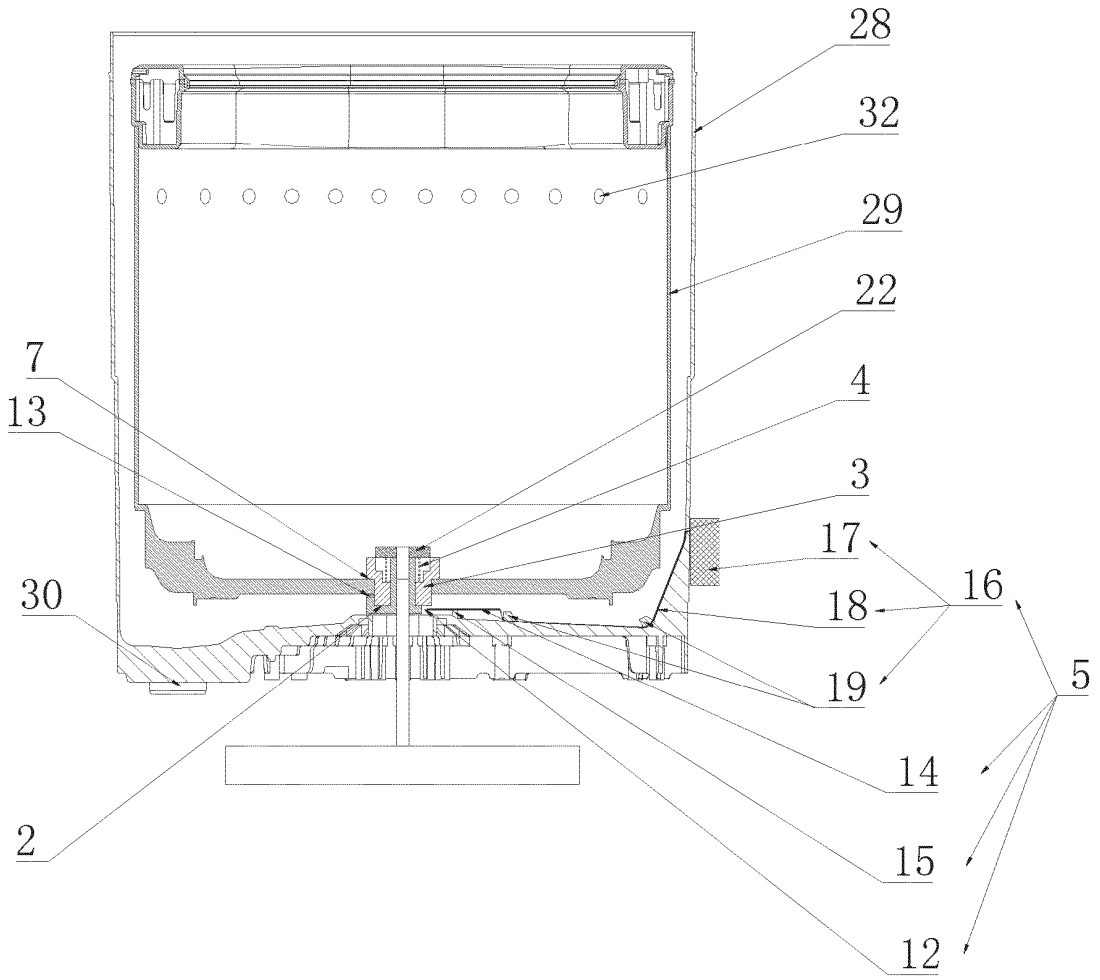
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Fig. 2

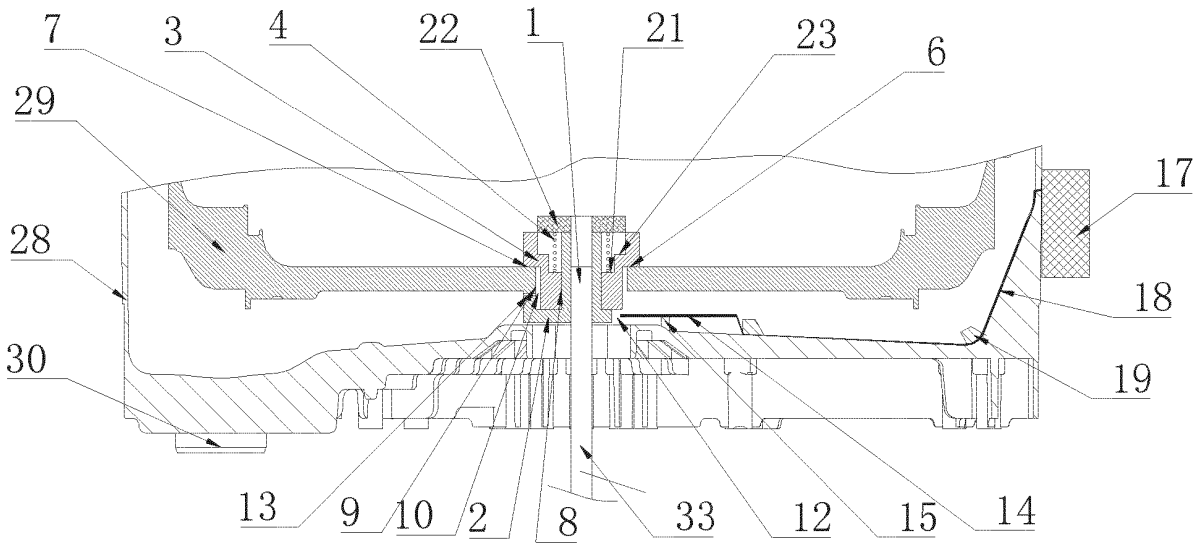
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Fig. 3

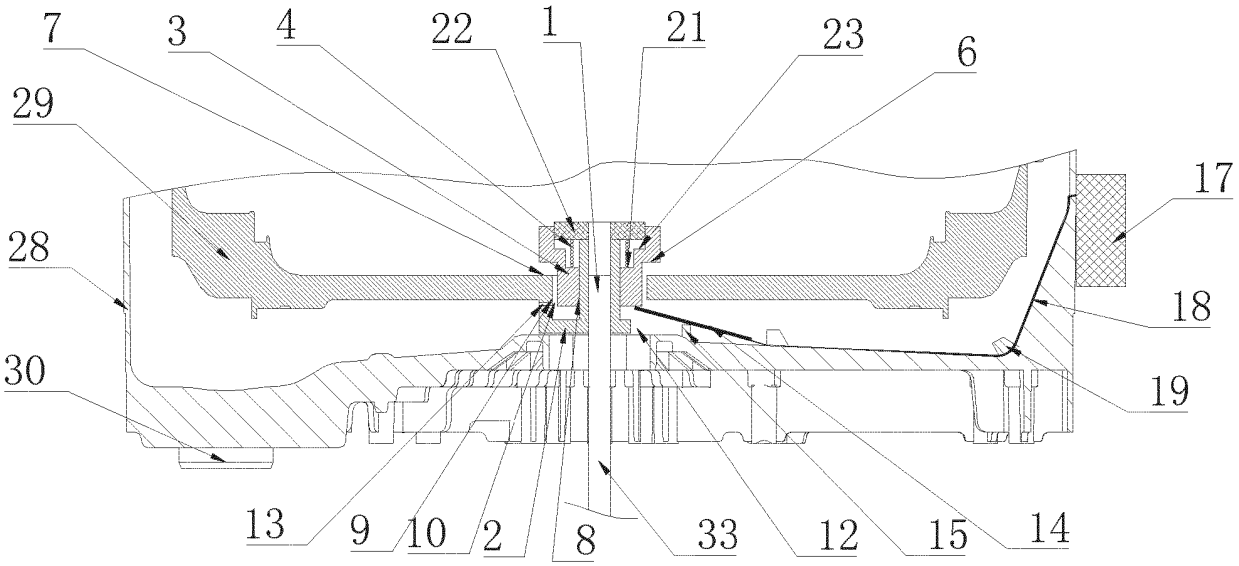
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Fig. 4

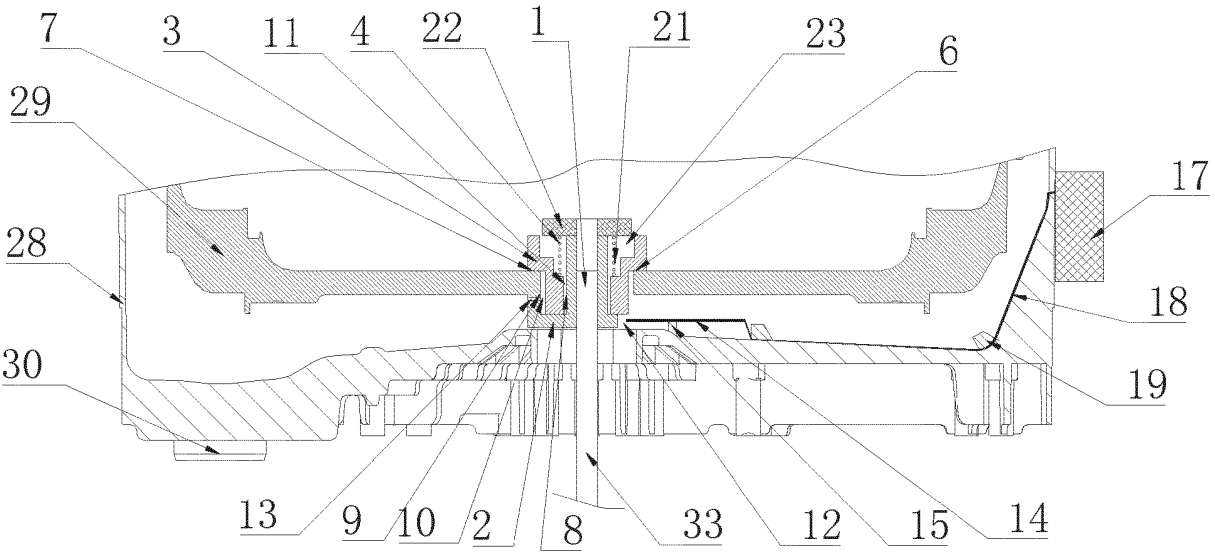
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Fig. 5

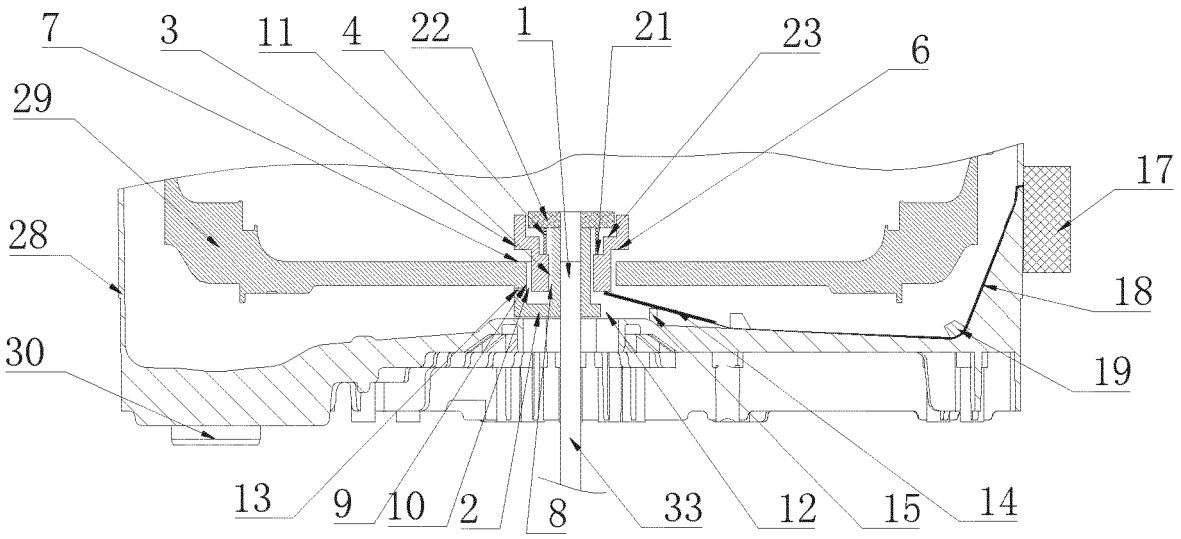
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Fig. 6

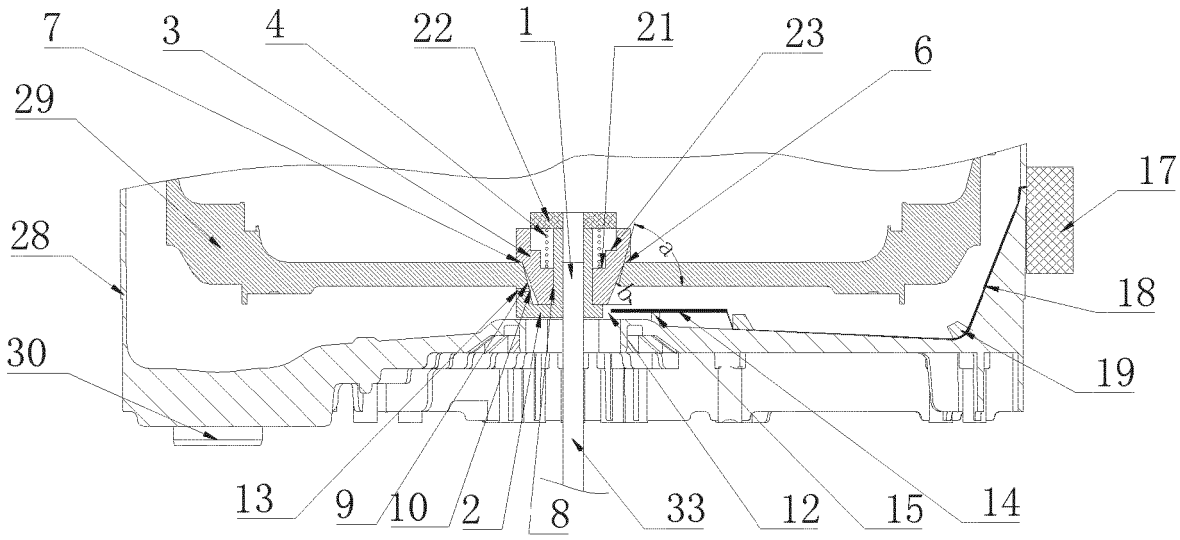
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Fig. 7

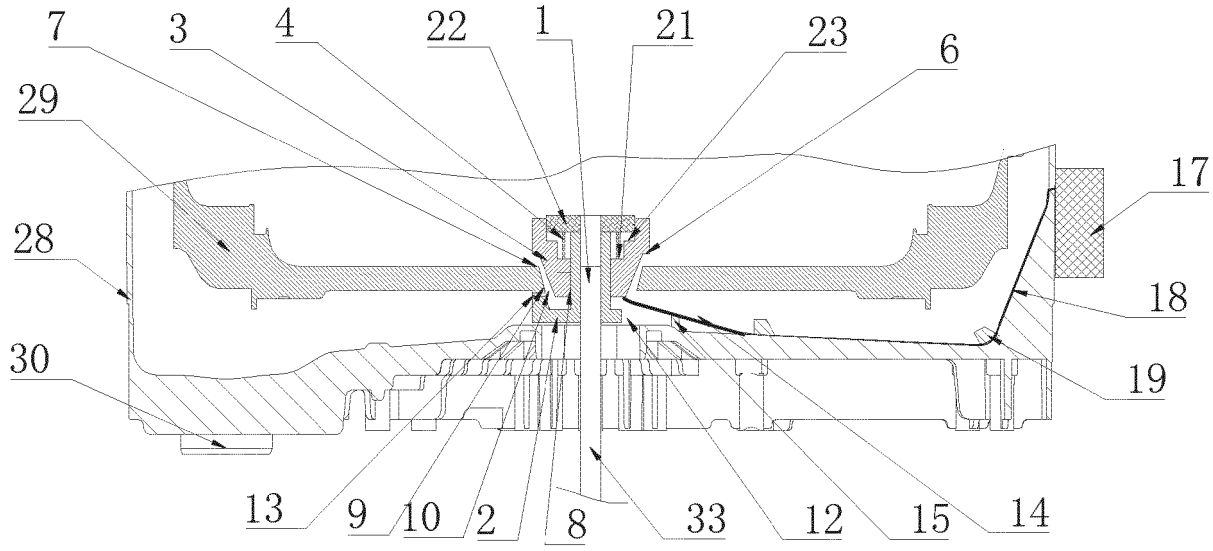

Fig. 8

REFERENCES CITED IN THE DESCRIPTION

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Patent documents cited in the description

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