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(54) **LAUNDRY LIFTING DEVICE FOR WASHING MACHINE, CENTRIFUGAL DRAINAGE MECHANISM, AND WASHING MACHINE**

(57) The present invention discloses a laundry lifting device for a washing machine, a centrifugal drainage mechanism and a washing machine. The laundry lifting device comprises: a lifting shell internally provided with a cavity with an opening; and a centrifugal drainage mechanism installed inside the lifting shell, wherein an initial state of the centrifugal drainage mechanism is a closed state, and the centrifugal drainage mechanism can be operated for drainage under a centrifugal force. The cavity of the lifting shell is separated by an independently enclosed installation cavity, and the centrifugal drainage mechanism is at least partially installed in the installation cavity. As to the laundry lifting device of the present invention, the centrifugal drainage mechanism is installed in the enclosed installation cavity independently separated out in the lifting shell, so water flow inside the inner drum does not enter into the installation cavity. The centrifugal drainage mechanism is in an environment free of thread debris. Thereby the possibility of adhering and winding thread debris on the centrifugal drainage

mechanism is fundamentally avoided, and the reliability of the centrifugal drainage mechanism is effectively ensured during operation.

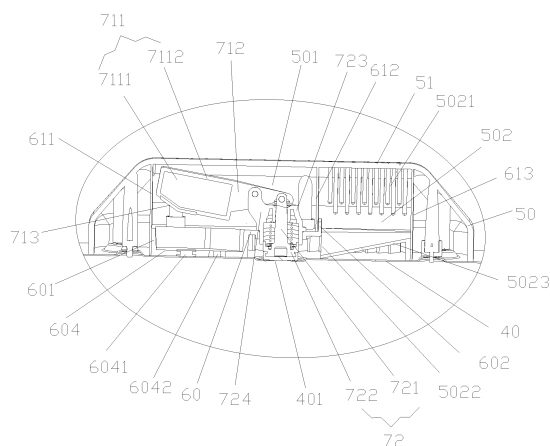


Fig. 1

Description

Field

[0001] The present invention relates to the technical field of laundry equipment, in particular to a laundry lifting device for a washing machine, a centrifugal drainage mechanism and a washing machine.

Background

[0002] As one of the mostly widely used household appliances in people's daily life, the existing washing machines help people to get rid of the trouble of washing laundry, and bring great convenience to people. However, washing machines also have certain shortcomings, for example, long time consumption and large water consumption. Along with development of the society, as an important natural resource, water resources have become increasingly important, and people's awareness of water saving has also increased, so it is particularly important how to realize a water-saving function of the washing machine. In addition, since an inner drum is not only configured to accommodate washing water, but also needs to rotate to beat and clean laundry inside the drum, therefore, how to design a dehydration structure and a drainage structure adapted to the above washing machine has become a problem to be urgently solved.

[0003] The Chinese patent application with an application number of 201810163971.6 discloses an inner drum lifting rib and a cleaning-free washing machine, including a lifting rib body extending along a construction line at a side wall of an inner drum. The body is a shell structure with a lower side being open and buckled to an inner side wall of the inner drum, the interior of the body is hollow to constitute an installation cavity for installation of a sealed valve. The lifting rib is provided with a water-passing structure which is configured to guide washing water inside the inner drum into an installation cavity. The periphery of the lifting rib body is in corresponding fit and contact with a side wall of the inner drum, at least one section of notch is arranged on the periphery, to allow washing water in the inner drum to flow into the installation cavity from the notch.

[0004] As to the cleaning-free washing machine proposed in the above application, a sealed valve is adopted for centrifugal drainage, and the problem of difficult drainage of a holeless drum washing machine is solved. However, since the hollow installation cavity inside the body of the lifting rib is connected with the interior of the inner drum, and washing water in the inner drum flows to the installation cavity from the notch, it is inevitable in the washing process that thread debris enters into the body of the lifting rib along with water flow and further enters into the sealed valve. Especially, thread debris is easily adhered and wound on counterweight blocks of the sealed valve or at the position where the counterweight block is hinged with an upper end of a valve plunger. So

the adhered and wound thread debris is difficult to remove, and severely affects normal operation of the sealed valve. Therefore, the sealed valve cannot be closed properly, and such phenomenon as water dripping or water leakage happens, or the thread debris may interfere with normal opening of the centrifugal drainage mechanism, and influence normal drainage of the washing machine.

[0005] In view of this, the present invention is hereby proposed.

Summary of the Invention

[0006] The technical problem to be solved in the present invention is to overcome shortcomings of the prior art, and the present application provides a laundry lifting device for a washing machine. Through installing a centrifugal drainage mechanism in an installation cavity which is independently enclosed in the lifting shell, it is effectively solved that thread debris and impurities in washing water of the existing washing machine enter into the centrifugal drainage mechanism to influence normal use of the centrifugal drainage mechanism.

[0007] To achieve the object, according to a first aspect of the present invention, the present invention adopts the following technical solutions.

[0008] A laundry lifting device for a washing machine, including:

- a lifting shell internally provided with a cavity having an opening;
- a centrifugal drainage mechanism installed in the lifting shell, wherein an initial state of the centrifugal drainage mechanism is a closed state, and the centrifugal drainage mechanism is operated for drainage under a centrifugal force; and
- an independently enclosed installation cavity, being separated in the cavity of the lifting shell, and the centrifugal drainage mechanism being at least partially installed in the installation cavity.

[0009] Further, a plurality of partition plates are fixedly arranged inside the lifting shell. The partition plates include partition baffle plates which separate the cavity of the lifting shell to form an installation cavity with an opening on a lower end, and an encapsulating baffle plate which are installed on the opening of the lower end to form the installation cavity being independent and enclosed, and a centrifugal component of the centrifugal drainage mechanism is arranged inside the installation cavity.

[0010] Further, the lifting shell includes a top wall and a circumferential side wall which is connected between the top wall and an inner wall of an inner drum of a washing machine. A distance between the encapsulating baffle plate and the top wall of the lifting shell is less than a distance between the top wall of the lifting shell and the inner wall of the inner drum, and there is a clearance

space between a bottom surface of the encapsulating baffle plate and the inner wall of the inner drum.

[0011] The partition baffle plates include a first baffle plate and a second baffle plate which are oppositely arranged inside the lifting shell along a length direction of the lifting shell. The first baffle plate and the second baffle plate are respectively connected to the top wall and the circumferential side wall of the lifting shell, and a distance between the first baffle plate and the second baffle plate is less than a length of the lifting shell.

[0012] Further, the circumferential side wall includes a first side wall and a second side wall which are connected to two long sides of the top wall, a lower end of the first side wall and a lower end of the second side wall are at least partially provided with notches to form water inlets for allowing water flowing in, and the water inlets are communicated with a drainage outlet on the inner drum with a cavity inside the inner drum.

[0013] The encapsulating baffle plate is embedded into the notches of the first side wall and the second side wall. Lower surfaces of both sides of the encapsulating baffle plate corresponding to the water inlets are provided with special-shaped grid baffle ribs through which water flows to be drained at a bending angle.

[0014] Preferably, multiple special-shaped grid baffle ribs are arranged at intervals in two long sides of the encapsulating baffle plate.

[0015] Further, the special-shaped grid baffle ribs are arc-shaped grid ribs with curved bending angles. Alternatively, the special-shaped grid baffle ribs are folded grid ribs with straight lines included angles. Alternatively, the special-shaped grid baffle ribs include longitudinal ribs and a plurality of guiding ribs arranged on both sides of the longitudinal ribs, and the guiding ribs on two adjacent longitudinal ribs are arranged in a staggered manner.

[0016] Further, a diversion channel is formed in the clearance space between two adjacent special-shaped grid baffle ribs, so that the diversion channel forms an arc-shaped reversing diversion channel from an inlet to an outlet due to the bending angle. Ends of the special-shaped grid baffle ribs at the outlet bend or fold towards the drainage outlet, to guide the drainage water flow to converge towards the drainage outlet.

[0017] Preferably, each of the arc-shaped grid ribs has a plurality of curved bending angles, or each of the folded grid ribs has a plurality of straight line included angles. Alternatively, the arc-shaped grid ribs or the folded grid ribs are of a multi-layered structure in which an upper layer and a lower layer are arranged in a staggered manner.

[0018] Further, a second spacing space is formed by an outer surface of the partition plate, the inner wall of the lifting shell and the inner wall of the inner drum on the periphery of the drainage outlet. The second spacing space is respectively communicated with the interior of the inner drum and the drainage outlet formed on the inner drum, so water inside the inner drum flows through

the second spacing space and is discharged via the drainage outlet.

[0019] Preferably, the second spacing space includes a drainage cavity arranged below the encapsulating baffle plate, and the installation cavity is arranged at a position close to an end part of the lifting shell. The second spacing space further includes a filtration cavity constituted by an outer side of the first baffle plate or the second baffle plate and the inner wall of the lifting shell.

[0020] Further, the centrifugal drainage mechanism further includes a valve plug component, and the valve plug component includes a valve plunger arranged coaxially with the drainage outlet and a valve plug connected to a lower end of the valve plunger. A valve plug through hole for allowing the valve plunger to pass through is formed at the position corresponding to the drainage outlet on the encapsulating baffle plate.

[0021] The centrifugal component includes a counterweight part and a connecting part arranged in the installation cavity, one end of the connecting part is fixedly connected with the counterweight part, the other end is hinged with an upper end of the valve plunger. A middle part is rotatably supported and fixed to form a lever structure, and a hinged point between the connecting part and the valve plunger is located within the installation cavity.

[0022] Preferably, an installation seat with a sleeve shape is installed on upper side of the encapsulating baffle plate, a through hole inside the installation seat is arranged coaxially with the valve plug through hole on the encapsulating baffle plate. The valve plunger is arranged within the installation seat, and a water sealed structure is arranged on the valve plunger and/or the installation seat.

[0023] Further, a bolt hole is formed on the encapsulating baffle plate, and a stud is injection molded on the inner wall of the lifting shell. A bolt is configured to pass through the bolt holes of the encapsulating baffle plate and be in threaded connection with the stud, to install the encapsulating baffle plates on the opening of the lower side of the partition baffle plates in a fastening manner.

[0024] Preferably, the encapsulating baffle plate is provided with a first flange/a second flange which is abutted against and in match with the first baffle plate/the second baffle plate.

[0025] Further, the centrifugal drainage mechanism includes a centrifugal component and a valve plug component connected with the centrifugal component.

[0026] The centrifugal component includes a counterweight part being capable of moving under a centrifugal force, and the movement of the counterweight part to drives the valve plug component to operate.

[0027] An installation cavity configured to install the centrifugal drainage mechanism is arranged inside the cavity of the lifting shell, and a buffer structure is arranged inside the installation cavity and/or on the counterweight part.

[0028] Further, the encapsulating baffle plate is installed at the position, close to the opening, inside the

lifting shell, and an installation cavity configured to install the centrifugal component is separated out on an upper of the cavity of the lifting shell by the encapsulating baffle plate.

[0029] The centrifugal component is arranged inside the installation cavity arranged above the encapsulating baffle plate. The buffer structure includes a first pressed structure which is convex outwards on a position of the encapsulating baffle plate corresponding to the counterweight part.

[0030] Further, the first pressed structure includes circumferential walls and a bottom wall which protrude out of a lower surface of the encapsulating baffle plate. The shape and size of the bottom wall are matched with the shape and size of the cross section of the counterweight part.

[0031] Further, the centrifugal drainage mechanism further includes the valve plug component which is connected with the counterweight part through the lever structure. A buffer cone angle used for avoiding the lever structure is arranged in an extending manner on the side, close to the valve plug component, of the first pressed structure.

[0032] The counterweight part is driven move under the centrifugal force, to drive the valve plug component to operate to open the drainage outlet on the inner drum for drainage.

[0033] Further, the centrifugal drainage mechanism further includes the valve plug component which is connected with the counterweight part through the lever structure, and a cutting corner for buffering is arranged on an end of the side, far away from the valve plug component, of the counterweight part, to form the buffer structure.

[0034] Preferably, the counterweight part is in a shape of a quadrangular prism, and the cutting corner for buffering is a cutting corner structure on the lower end, far away from the valve plug component, of the counterweight part.

[0035] Further, the buffer structure further includes a first buffer pad arranged outside a bottom wall of the counterweight part.

[0036] Preferably, a cutting corner structure is arranged on the lower end, far away from the valve plug component, of the counterweight part. The bottom wall of the counterweight part includes a horizontal straight wall surface and an inclined wall surface formed by the cutting corner structure, and the first buffer pad is arranged on the position between the straight horizontal wall surface and the inclined wall surface in a coating manner.

[0037] Further, the buffer structure further includes a second buffer pad arranged on the bottom wall of the first pressed structure.

[0038] Preferably, a buffer pad installation position is arranged on the bottom wall of the first pressed structure corresponding to an intersected position between the cutting corner structure of the counterweight part and the

bottom wall of the counterweight part. The second buffer pad is embedded in the buffer pad installation position, and an upper surface of the second buffer pad is slightly higher than or is flush with an upper surface of the bottom wall.

[0039] Further, the bottom wall of the first pressed structure is provided with one or more pressure relief holes which are arranged at intervals.

[0040] Preferably, a check valve is installed within the pressure relief hole.

[0041] Further, a second pressed structure which protrudes upwards is arranged on a top wall of the lifting shell corresponding to the counterweight part. The buffer structure further includes the second pressed structure which provides a buffer space in rising of the counterweight part.

[0042] Another object of the present invention is to provide a washing machine with any of the laundry lifting devices mentioned above. The washing machine includes:

an inner drum;

an inner drum door, which is installed on an opening of the inner drum in an openable and closable manner, wherein an independent washing cavity for independently accommodating washing water in washing laundry is formed by the inner drum door and the inner drum when the inner drum door is in close.

[0043] A drainage outlet, arranged on a side wall of the inner drum, wherein, the laundry lifting device is installed on a drainage outlet of an inner wall of the inner drum, and the centrifugal drainage mechanism is configured to close/open the drainage outlet.

[0044] According to a second aspect of the present invention, another object of the present application is to further provide a centrifugal drainage mechanism. The centrifugal drainage mechanism includes a centrifugal component and a valve plug component, the centrifugal component includes a counterweight part and a connecting part, and the counterweight part includes a counterweight block shell and a counterweight block arranged inside the counterweight block shell.

[0045] One end of the connecting part is connected with the counterweight block shell, another end is rotatably connected with the valve plug component, and a middle part can be rotatably supported and fixed, to form a lever structure.

[0046] The counterweight block is driven to move under a centrifugal force, to drive the valve plug component to operate to open the drainage outlet on the inner drum for drainage.

[0047] Further, one end of the connecting part connected with the valve plug component is gradually enlarged towards the other end connected with the counterweight block shell.

[0048] Further, the connecting part is a plate structure with a cross section of a triangular shape, and one side edge of the connecting part is fixedly connected to a side wall, close to the valve plug component, of the counterweight block shell.

[0049] Preferably, a longitudinal section of the connecting part is of a triangular shape.

[0050] Further, a reinforcing structure configured to improving strength is arranged at the position at which the connecting part is connected with the counterweight block shell, and the reinforcing structure is a reinforcing rib with plate shape which is connected with the connecting part and the counterweight block shell.

[0051] Preferably, at least two reinforcing ribs with plate shape are provided, and the reinforcing ribs with plate shape are arranged on left and right sides of the connecting part.

[0052] Further, the connecting part is provided with an extending connecting rib which is arranged in a protruding manner. The extending connecting rib is formed by extending an upper edge of the connecting part towards the counterweight part.

[0053] The extending connecting rib has an extending length. The lower side of the extending connecting rib is fixedly connected with an upper side wall of the counterweight block shell.

[0054] Further, the counterweight block shell and the connecting part are integrally molded through injection molding.

[0055] Further, the counterweight block is made of metal materials, and the counterweight block shell is made of non-metallic materials with corrosion-resistant.

[0056] Preferably, the counterweight block shell is made of plastic materials.

[0057] Further, along a length direction of the counterweight block, the counterweight block shell includes circumferential side walls enclosing a structure with the openings on two ends. A first end side wall and a second end side wall which are arranged on two ends of the structure, and one end of the connecting part is fixedly connected onto the first end side wall/the second end side wall;

[0058] The circumferential side walls include a first side wall, a second side wall, a third side wall and a fourth side wall which are connected in sequence from end to end. The connecting positions among the first side wall, the second side wall, the third side wall and the fourth side wall are in smooth and transitional connection.

[0059] Further, there is a clearance between the counterweight block shell and the counterweight block, and the clearance is filled with sealing medium.

[0060] Preferably, the sealing medium is colloidal, the clearance between the counterweight block and the counterweight block shell is filled with glue to bond the counterweight block and the counterweight block shell into a whole.

[0061] Another object of the present invention is to provide a washing machine with any of the centrifugal drain-

age mechanisms mentioned above. The washing machine includes:

- 5 an inner drum, configured to independently accommodate washing water in washing laundry;
- a laundry lifting device, installed on a drainage outlet of the inner wall of the inner drum; and
- 10 the centrifugal drainage mechanism, installed in the lifting shell of the laundry lifting device to block and close the drainage outlet, wherein the centrifugal drainage mechanism can open the drainage outlet for drainage under a centrifugal force.

[0062] After the above technical solutions are employed, the present invention has the following beneficial effects as compared with the prior art.

1. As to the laundry lifting device for a washing machine provided in the present invention, the enclosed installation cavity is independently separated out in the lifting shell, a centrifugal drainage mechanism is installed in the installation cavity, water flow inside the inner drum does not enter into the installation cavity, such that the centrifugal drainage mechanism is in an environment free of thread debris. Thereby the possibility of adhering and winding thread debris on centrifugal drainage mechanism is fundamentally avoided, and the reliability of the centrifugal drainage mechanism is effectively ensured during operation.
2. As to the laundry lifting device for a washing machine provided in the present invention, partition baffle plates and encapsulating baffle plate are arranged in the lifting shell to separate out an independently enclosed installation cavity in the cavity of the lifting shell, and then the centrifugal component of the centrifugal drainage mechanism is arranged in the installation cavity. The partition baffle plates and the encapsulating baffle plate play a role of blocking impurities and thread debris from entering the installation cavity along with washing water for the second time. Thereby it is effectively to solve the problem that thread debris is easily adhered and wound on the counterweight part of the centrifugal valve or at the position where the connecting part is hinged with an upper end of a valve plunger of the existing washing machine.
3. As to the laundry lifting device for a washing machine provided in the present invention, the special-shaped grid baffle ribs are arranged at the water inlet of the lifting shell and can make the drainage washing water flow through at a certain bending angle, so thread debris can be effectively blocked from entering into the drainage cavity and blocking the drainage outlet. Thereby normal drainage is operated because thread debris is avoided adhering at the centrifugal drainage mechanism or blocking at the drainage outlet.

Brief Description of the Drawings

[0063]

Fig. 1 is a partial sectional view of a washing machine when a centrifugal drainage mechanism in the present invention is in a closed state;

Fig. 2 is a partial sectional view of a washing machine when a centrifugal drainage mechanism in the present invention is in an open state;

Fig. 3 is a structural schematic diagram of one viewpoint of a laundry lifting device in the present invention;

Fig. 4 is a structural schematic diagram of another viewpoint of a laundry lifting device in the present invention;

Fig. 5 is a structural schematic diagram of a laundry lifting device in the present invention with encapsulating baffle plates being removed;

Fig. 6 is a structural schematic diagram of a laundry lifting device in the present invention with a lifting shell being removed;

Reference numerals in the figures:

[0064]

40. inner drum; 401. drainage outlet;
50. lifting shell; 51. top wall; 52. circumferential side wall; 521. water inlet; 53. stud;
501. installation cavity; 502. filtration cavity; 5021. comb-shaped filtration structure; 5022. opening; 5023. diversion plate; 503. drainage cavity;
60. encapsulating baffle plate; 601. first flange; 602. second flange; 603. special-shaped grid baffle rib; 604. first pressed structure; 6041. second buffer pad; 6042. water relief hole; 6043. buffer cone angle; 6044. pressed bottom wall; 605. bolt;
611. first baffle plate; 612. second baffle plate; 613. third baffle plate;
70. centrifugal drainage mechanism;
71. centrifugal component; 711. counterweight part; 7111. counterweight block; 7112. counterweight block shell; 7113. cutting angle structure; 712. connecting part; 7121. plate-shaped reinforcing rib; 7122. extending connecting rib; 713. first buffer pad;
72. valve plug component; 721. valve plunger; 722. valve plug; 723. installation seat; 724. rotating shaft support.

Detailed Description of the Embodiments

[0065] In order to make objects, technical solutions and advantages of the embodiments of the present invention clearer, a clear and complete description is given below on the technical solutions in the embodiments in combination with accompanying drawings in the embodiments of the present invention, and the following embodiments

are used for illustrating the present invention, rather than limiting the scope of the present invention.

[0066] In the description of the present invention, it should be noted that, the orientation or positional relationship indicated by such terms as "up", "down", "front", "rear", "left", "right", "vertical", "inner" and "outer" is the orientation or positional relationship based on the accompanying drawings. Such terms are merely for the convenience of description of the present invention and simplified description, rather than indicating or implying that the device or element referred to must be located in a certain orientation or must be constructed or operated in a certain orientation, therefore, the terms cannot be understood as a limitation to the present invention.

[0067] In the description of the present invention, it should be noted that, unless otherwise stipulated and defined definitely, such terms as "installed", "connected" and "in connection" should be understood in their broad sense, e.g., the connection can be a fixed connection, a detachable connection or an integral connection; can be mechanical connection or electrical connection; and can be direct connection or can be indirect connection through an intermediate. For those skilled in the art, specific meanings of the above terms in the present invention can be understood according to specific conditions.

[0068] The present invention is further described in details below in combination with embodiments.

Embodiment 1

[0069] The present embodiment provides a laundry lifting device for a washing machine, which mainly aims at solving the problem that the centrifugal drainage mechanism cannot be closed properly or cannot discharge water normally since the components of the centrifugal drainage mechanism installed in the existing laundry lifting device are easily adhered and wound with thread debris.

[0070] As shown in Fig. 1 to Fig. 6, the present embodiment provides a laundry lifting device for a washing machine, including:

a lifting shell 50, internally provided with a cavity with an opening;

a centrifugal drainage mechanism 70, installed in the lifting shell 50. As shown in Fig. 1 and Fig. 5, an initial state of the centrifugal drainage mechanism 70 is a closed state, to block and close the drainage outlet 401 on the inner drum 40, and as shown in Fig. 2 and Fig. 5, the centrifugal drainage mechanism 70 can be operated to open the drainage outlet 401 for drainage under the effect of a centrifugal force.

[0071] As shown in Fig. 1, Fig. 2 and Fig. 6, the cavity of the lifting shell 50 is separated by an independently enclosed installation cavity 501, and the centrifugal drainage mechanism 70 is at least partially installed in the installation cavity 501.

[0072] The lifting shell 50 is provided with a water inlet 521 which allows washing water in the inner drum 40 to flow into the lifting shell 50, therefore, the cavity of the lifting shell 50 is communicated with the inside of the inner drum 40, while the centrifugal drainage mechanism 70 is directly installed inside the cavity of the lifting shell 50. It is unavoidable that thread debris enters into the lifting shell 50 along with water flow and further enters into the centrifugal drainage mechanism 70 in the washing process.

[0073] In the present embodiment, the centrifugal drainage mechanism 70 is installed in an installation cavity 501 independently enclosed which is additionally arranged in the cavity of the lifting shell 50. The installation cavity 501 can play a role of blocking thread debris from entering into the centrifugal drainage mechanism 70 for the second time. Thread debris inside the inner drum 40 does not enter into the installation cavity 501 along with water flow, such that the centrifugal drainage mechanism 70 is in an environment free of thread debris, thereby fundamentally avoiding possibility of adhering and winding of thread debris, and effectively ensuring reliability of the centrifugal drainage mechanism 70 during operation.

[0074] Further, a plurality of partition plates are fixedly arranged inside the lifting shell 50, and an independently enclosed installation cavity 501 is formed in the lifting shell 50 by the partition plates. The partition plates can be injection molded with the lifting shell 50, to form the independently enclosed installation cavity 501. Alternatively, the partition plates can be integrated with the lifting shell 50 through a connecting piece, to form the independently enclosed installation cavity 501.

[0075] Specifically, the partition plates include partition baffle plates and an encapsulating baffle plate 60, the partition baffle plates separate the cavity of the lifting shell 50 to form an installation cavity 501 with an opening downward, and the encapsulating baffle plate 60 are encapsulated on the opening of a lower end of the installation cavity 501 to form an independently enclosed installation cavity 501. A centrifugal component 71 of the centrifugal drainage mechanism 70 is arranged inside the installation cavity 501.

[0076] Through the arrangement of the partition baffle plates and the encapsulating baffle plate 60 in the lifting shell 50, an independently enclosed installation cavity 501 is separated from the cavity of the lifting shell 50. The centrifugal component 71 of the centrifugal drainage mechanism 70 is arranged in the installation cavity 501. The partition baffle plates and the encapsulating baffle plate 60 play a role of blocking impurities and thread debris from entering the installation cavity 501 along with washing water for the second time.

[0077] In the present embodiment, the encapsulating baffle plate 60 and the partition baffle plates can be impermeable plate-shaped structures, such that the installation cavity 501 can be a sealed cavity. Water inside the inner drum 40 does not enter the installation cavity 501, thereby further avoiding thread debris and other impuri-

ties from entering the installation cavity 501.

[0078] Alternatively, in another solution, the encapsulating baffle plate 60 and the partition baffle plates can also be plate-shaped structures with a plurality of filtration holes. The encapsulating baffle plate 60 and the partition baffle plates play a role of filtering thread debris in the washing water for the second time, and water inside the inner drum 40 can enter into the installation cavity 501 via the filtration holes, however, thread debris is blocked outside and does not enter into the installation cavity 501.

[0079] Preferably, in the present embodiment, the encapsulating baffle plate 60 and the partition baffle plates are impermeable plate-shaped structures, and can effectively avoid washing water from entering into the installation cavity 501 while playing a role of blocking thread debris from entering into the installation cavity 501. Thereby reliability of the centrifugal drainage mechanism 70 is further ensured during operation.

[0080] Further, the lifting shell 50 includes a top wall 51 and a circumferential side wall 52 which is connected between the top wall 51 and the inner wall of an inner drum 40 of a washing machine. The distance between the encapsulating baffle plate 60 and the top wall 51 of the lifting shell 50 is less than the distance between the top wall 51 of the lifting shell 50 and the inner wall of the inner drum 40.

[0081] There is a clearance space between the bottom wall of the encapsulating baffle plate 60 and the inner wall of the inner drum 40, and the clearance space formed between the bottom wall surface of the encapsulating baffle plate 60 and the inner wall surface of the inner drum 40 is a drainage cavity 503 for discharging washing water. The drainage cavity 503 is respectively communicated with the interior of the inner drum 40 and the drainage outlet 401 on the inner drum 40, and washing water inside the inner drum 40 can enter into the drainage outlet 401 on the inner drum 40 via the drainage cavity 503, and is then discharged from the drainage outlet 401.

[0082] As shown in Fig. 1, Fig. 2 and Fig. 5, the partition baffle plates include a first baffle plate 611 and a second baffle plate 612 which are arranged inside the lifting shell 50 oppositely along a length direction of the lifting shell 50. The first baffle plate 611 and the second baffle plate 612 are respectively connected to the top wall 51 and the circumferential side wall 52 of the lifting shell 50, and the first baffle plate 611 and the second baffle plate 612 are injection molded with the lifting shell 50.

[0083] The relative distance between the first baffle plate 611 and the second baffle plate 612 is less than the length of the lifting shell 50. Along the length direction of the lifting shell 50, the length of the installation cavity 501 is less than the length of the lifting shell 50.

[0084] Preferably, the installation cavity 501 is arranged close to one side of the lifting shell 50, of which a larger installation space can be provided for installing a filtration part inside the lifting shell 50 in compare with arrangement of the installation cavity 501 in the middle of the lifting shell 50.

[0085] Further, as shown in Fig. 2, Fig. 3 and Fig. 6, the circumferential side wall 52 includes a first side wall and a second side wall which are connected to two long sides of the top wall 51. The lower edge of the first side wall and the lower edge of the second side wall are at least partially provided with the notches to form a water inlet 521 for water inlet. The water inlet 521 is communicated with the drainage outlet 401 on the inner drum 40 with the inside of the inner drum 40.

[0086] The notches are arranged at the lower edge of the first side wall and the lower edge of the second side wall, the notches have a length extending in an axial direction, and the notch is strip-shaped. The encapsulating baffle plates 60 are embedded into the notch of the first side wall and the notch of the second side wall.

[0087] The upper edge of the first baffle plate 611 and the upper edge of the second baffle plate 612 are connected onto the top wall 51 of the lifting shell 50, and the two side edges are respectively connected to the first side wall and the second side wall of the lifting shell 50.

[0088] Preferably, a third baffle plate 613 is arranged in the lifting shell 50. The first baffle plate 611 and the third baffle plate 613 are arranged at the ends close to two sides of the lifting shell 50. Three spaces are formed by the first baffle plate 611/the second baffle plate 612 in the cavity of the lifting shell 50, and the spaces arranged outsides of the first baffle plate 611/the second baffle plate 612 are used for independently setting an installation structure for installing the lifting shell 50.

[0089] The lower edge of the first side wall and the lower edge of the second side wall of the lifting shell 50 between the first baffle plate 611 and the second baffle plate 613 are provided with the notches, and the encapsulating baffle plate 60 is installed in the installation position formed by the first baffle plate 611, the second baffle plate 612, the first side wall and the second side wall. The second baffle plate 612 is arranged inside the lifting shell 50 and between the first baffle plate 611 and the third baffle plate 613. The lower edge of the second baffle plate 612 is extended onto the upper wall surface of the encapsulating baffle plate 60. Taking the installation cavity 501 being arranged inside the lifting shell 50 close to an opening of the inner drum 40 as an example, the first baffle plate 611 is arranged close to the opening of the inner drum, and the inner wall surfaces of the second baffle plate 612, the first baffle plate 611 and the encapsulating baffle plate 60 form the installation cavity 501.

[0090] In an implementation, as shown in Fig. 3 to Fig. 6, as to the laundry lifting device provided in the present embodiment, special-shaped grid baffle ribs 603 is arranged below two sides of the encapsulating baffle plates 60 corresponding to the water inlet 521 to make washing water flow at a certain bending angle. When washing water flows through the water inlet 521, thread debris can be blocked and adhered onto the special-shaped grid baffle ribs 603 and does not enter into the drainage cavity 503.

[0091] Preferably, a plurality of special-shaped grid

baffle ribs 603 are provided and are arranged at intervals along two long sides of the encapsulating baffle plates 60. Through the plurality of special-shaped grid baffle ribs 603 arranged at intervals on the two long sides of the encapsulating baffle plates 60, thread debris can be effectively blocked from entering into the drainage cavity 503 and blocking the drainage outlet 401. Thereby it is avoided to affect normal drainage because thread debris is adhered at the centrifugal drainage mechanism 70 or blocked at the drainage outlet 401.

[0092] Further, the special-shaped grid baffle ribs 603 are arc-shaped grid ribs with curved bending angles. For example, the special-shaped grid baffle ribs 603 can have a shape of a forward "S" or a reverse "S". Alternatively, the special-shaped grid baffle ribs 603 may be folded grid ribs with straight line included angle, for example, the special-shaped grid baffle ribs 603 may be in a shape of "<" or ">". When washing water flows through the special-shaped grid baffle ribs 603, thread debris is blocked at the curved bending angle or the straight line included angle of the special-shaped grid baffle ribs 603, and does not enter into the drainage cavity 503.

[0093] Further, a diversion channel is formed in the clearance space between two adjacent special-shaped grid baffle ribs 603. Through the arrangement of bending angle, the diversion channel forms an arc-shaped reversing diversion channel from the inlet to the outlet. Thereby on the one hand, thread debris is blocked and filtered, and on the other hand, the flow velocity of water flow is increased by reversing direction.

[0094] Preferably, the outlet ends of the special-shaped grid baffle ribs 603 bend or fold towards the direction of the drainage outlet 401, to guide the water flow to converge towards the direction of the drainage outlet 401.

[0095] For example, the special-shaped grid baffle ribs 603 are arc-shaped grid ribs in the shape of a forward "S" or a reverse "S". The arc-shaped grid ribs arranged the left side and rear side of the drainage outlet 401 are in a shape of a forward "S", the arc-shaped grid ribs arranged the right side and rear side of the drainage outlet 401 are in a shape of a reverse "S", the arc-shaped grid ribs arranged the left side and front side of the above drainage outlet 401 are in a shape of a reverse "S", and the arc-shaped grid ribs arranged the right side and front side of the drainage outlet 401 are in a shape of a forward "S".

[0096] For another example, the special-shaped grid baffle ribs 603 are arc-shaped grid ribs in the shape of "<" or ">". The folded grid ribs arranged on the left side and rear side of the drainage outlet 401 are in a shape of a forward "<", the arc-shaped grid ribs arranged on the right side and rear side of the drainage outlet 401 are in a shape of ">", the arc-shaped grid ribs arranged on the left side and front side of the drainage outlet 401 are in a shape of a reverse "<", and the arc-shaped grid ribs arranged on the right side and front side of the drainage outlet 401 are in a shape of a forward ">".

[0097] Through the above design, the clearance space between the two special-shaped grid baffle ribs 603 forms a diversion channel with an outlet end facing towards the direction of the drainage outlet 401, thereby facilitating convergence of water flow.

[0098] Preferably, the arc-shaped grid ribs/the folded grid ribs are respectively provided with a plurality of curved bending angles/straight line included angles. Through the plurality of set bending angles or straight line included angles, the water flow can be bent for multiple times, and the effect of blocking thread debris is better.

[0099] Alternatively, the arc-shaped grid ribs/the folded grid ribs are multi-layered structures in which an upper layer and a lower layer are arranged in a staggered manner. By setting a plurality of layers of arc-shaped grid ribs/folded grid ribs, the water flow can be bent for multiple times and the effect of blocking thread debris is better.

[0100] Moreover, in the above solution, the arc-shaped grid ribs/the folded grid ribs are arranged as the upper layer and the lower layer which are arranged in a staggered manner. The arc-shaped grid ribs/folded grid ribs in the upper layer are arranged between two grid ribs in the lower layer. If thread debris passes through the diversion channel between two grid ribs in the lower layer, grid ribs in the upper layer can block thread debris from passing through for the second time, thereby further avoiding thread debris from entering into the drainage cavity 503 of the lifting shell 50.

[0101] In another implementation, the special-shaped grid baffle ribs 603 include longitudinal ribs and a plurality of guiding ribs arranged at two sides of the longitudinal ribs. The guiding ribs on two adjacent longitudinal ribs are arranged in a staggered manner. Through a plurality of guiding ribs arranged at two sides of the longitudinal ribs, a curved diversion channel is formed, to play a role of effectively blocking thread debris.

[0102] The guiding ribs can be horizontal ribs which can be arranged horizontally. Preferably, the guiding ribs are set to be inclined, and the guiding ribs are inclined ribs which are inclined towards the direction of the outlet of the diversion channel, to guide water flow.

[0103] More preferably, the guiding ribs arranged at the outlet end of the diversion channel are inclined towards the drainage outlet 401 of the inner drum 40, facilitating gathering water flow towards the drainage outlet 401 and discharging out.

[0104] As to the laundry lifting device for a washing machine provided in the present embodiment, the special-shaped grid baffle ribs 603 are arranged at the water inlet 521 of the lifting shell 50 and can make the washing water flow through at a certain bending angle, so thread debris can be effectively blocked from entering into the drainage cavity 503 and blocking the drainage outlet 401. Thereby normal drainage is not affected because thread debris is avoided being adhered at the centrifugal drainage mechanism 70 or blocked at the drainage outlet 401.

[0105] Further, a first spacing space formed by the encapsulating baffle plate 60, the partition baffle plates and the inner wall of the lifting shell 50 is the installation cavity 501. A second spacing space is formed by the outer walls of the partition plates and the inner wall of the lifting shell 50 and the inner wall of the inner drum 40 on the periphery of the drainage outlet 401. The second spacing space is respectively communicated with the interior of the inner drum 40 and the drainage outlet 401 formed on the inner drum 40, and water inside the inner drum 40 flows through the second spacing space and is discharged via the drainage outlet 401.

[0106] Preferably, the second spacing space includes a drainage cavity 503 arranged below the encapsulating baffle plate 60. The installation cavity 501 is arranged close to the end of the lifting shell 50. The second spacing space further includes a filtration cavity 502 constituted by an outer side of the first baffle plate 611/the second baffle plate 612 and the inner wall of the lifting shell 50, and the filtration cavity 502 is internally installed with a filtration structure.

[0107] As shown in Fig. 1, Fig. 2 and Fig. 6, in the present embodiment, the filtration cavity 502 is constituted by a space between the right side surface of the second baffle plate 612 and the inner wall surface of the lifting shell 50. A plurality of through holes are formed on the top wall 51 or the circumferential side wall 52 of the lifting shell 50 corresponding to the filtration cavity 502, and the through holes are communicated with the filtration cavity 502. Preferably, the through holes are formed on the top wall 51 of the lifting shell 50. The filtration cavity 502 exchanges the water flow with the inner drum 10 through the through holes formed on the lifting shell 50, and the drainage cavity 503 guides the water inside the inner drum 40 towards the drainage outlet 401 formed on the inner drum 40.

[0108] Further, as shown in Fig. 1 and Fig. 5, the centrifugal drainage mechanism 70 further includes a valve plug component 72, and the valve plug component 72 includes a valve plunger 721 arranged coaxially with the drainage outlet 401 and a valve plug 722 connected to a lower end of the valve plunger 721. Under a natural state, the valve plug 722 blocks the drainage outlet 401, to ensure the sealing performance of the inner drum 40. A valve plug through hole which allows the valve plunger 721 to pass through is formed at the position corresponding to the drainage outlet 401 on the encapsulating baffle plate 60.

[0109] The centrifugal component 71 includes a counterweight part 711 and a connecting part 712 arranged in the installation cavity 501. One end of the connecting part 712 is fixedly connected with the counterweight part 711, the other end is hinged with an upper end of the valve plunger 721, and the middle part of the connecting part 712 is rotatably supported and fixed, to form a lever structure.

[0110] A hinged point between the connecting part 712 and the valve plunger 721 is located within the installation

cavity 501. The counterweight part 711 moves downwards under the effect of a centrifugal force, and drives the valve plunger 721 to move upwards by utilizing a lever principle. Further the valve plug 722 opens the drainage outlet 401 on the inner drum 40 for drainage.

[0111] The counterweight part 711 and the connecting part 712 of the centrifugal component 71 and a hinged point between the connecting part 712 and the valve plunger 721 are all located inside the installation cavity 501, thereby effectively avoiding thread debris from adhering and winding at the counterweight part 711 or the hinged position between the connecting part 712 and the valve plunger 721 to influence normal operation of the centrifugal drainage mechanism 70.

[0112] Preferably, an installation seat 723 with a sleeve shape is installed on upper side of the encapsulating baffle plate 60. The through hole on the inner side of the installation seat 723 is arranged coaxially with the through hole of the valve plug on the encapsulating baffle plate 60, the valve plunger 721 is arranged within the installation seat 723 in a manner of moving up and down. A water sealed structure is arranged on the valve plunger 721 and/or the installation seat 723. Through the arrangement of the water sealed structure, thread debris can be further prevented from entering into the installation cavity 501 along with washing water, such that the centrifugal drainage mechanism 70 is in an environment free of thread debris, and the possibility of adhering and winding of thread debris is reduced.

[0113] As shown in Fig. 1 and Fig. 2, the middle part of the connecting part 712 is provided with a rotating shaft hole or a rotating shaft. A rotating shaft support 724 is arranged on a side, close to the counterweight part 711, of the installation seat 723, the rotating shaft support 724 supports and matches with the rotating shaft hole of the connecting part 712 in a rotating manner. When the counterweight part 711 rotates up and down around a pivot of the rotating shaft support 724 and the connecting part 712 under a centrifugal force, the valve plug 722 is driven to move up and down in the second spacing space between lower sidewall of the encapsulating baffle plate 60 and the inner wall of the inner drum 40, to open or close the drainage outlet 401.

[0114] Further, as shown in Fig. 3, Fig. 4 and Fig. 6, the encapsulating baffle plate 60 are formed with bolt holes, the inner wall of the lifting shell 50 is injection molded with studs 53. The bolt 605 passes through the bolt hole to be in threaded connection with the stud 53, to install the encapsulating baffle plates 60 on the openings of the lower sides of the partition baffle plates in a fastening manner.

[0115] Specifically, four bolt holes are respectively arranged at four corners of the encapsulating baffle plate 60, the inner wall of the lifting shell 50 is correspondingly injection molded with four studs 53 which are arranged to extend downwards, and the encapsulating baffle plate 60 is installed at the lower end of the lifting shell 50 through the bolt 605 in a fastening manner.

[0116] Preferably, as shown in Fig. 1 and Fig. 2, the encapsulating baffle plate 60 is respectively provided with a first flange 601/a second flange 602 which is abutted against and limits with the position of the first baffle plate 611/the second baffle plate 612. The side of the encapsulating baffle plate 60 close to the first baffle plate 611 extends downwards to form the first flange 601, an outer wall surface of the first flange 601 is closely abutted against an inner wall surface of the first baffle plate 611. The second flange 602 extending upwards is arranged at the position on the encapsulating baffle plate 60 corresponding to the second baffle plate 612, and the second flange 602 coats the lower edge of the second baffle plate 612 inside the second flange 602. The outer wall surface of the second baffle plate 612 is closely abutted against the inner wall surface of the second flange 602. **[0117]** Through the arrangement of the first flange 601 and the second flange 602, the encapsulating baffle plate 60 is in close match with the first baffle plate 611 and the second baffle plate 612 via a mode in which one surface is abutted against another surface, so a sealing effect at the boundary position is ensured. Thereby it is avoided that thread debris enters into the installation cavity 501 together with washing water through the position where the first baffle plate 611 and the second baffle plate 612 are connected with the encapsulating baffle plate 60.

[0118] The present embodiment further provides a washing machine with the above laundry lifting device, including:

an inner drum 40;

an inner drum door which can be installed on an opening of the inner drum 40 in an openable and closable manner, wherein an independent washing cavity is formed by the inner drum door and the inner drum 40 when the inner drum door is closed, to independently accommodate washing water in washing laundry;

a drainage outlet 401 is arranged on a side wall of the inner drum 40, the laundry lifting device is installed on the drainage outlet 401 of the inner wall of the inner drum 40, and the centrifugal drainage mechanism 70 can close/open the drainage outlet 401.

Embodiment 2

[0119] The present embodiment is an improved solution made to the centrifugal drainage mechanism 70 on the basis of Embodiment 1, which mainly solves the problems that the existing counterweight part 711 is easily rusted and corroded and reliability between the counterweight part 711 and the connecting part 712 is poor.

[0120] As shown in Fig. 1 to Fig. 6, the centrifugal drainage mechanism 70 provided in the present embodiment includes a centrifugal component 71 and a valve plug component 72. The centrifugal component 71 includes a counterweight part 711 and a connecting part 712, and

the counterweight part 711 includes a counterweight block shell 7112 and a counterweight block 7111 arranged inside the counterweight block shell 7112.

[0121] Through a counterweight block shell 7112 additionally arranged outside the counterweight block 7111, the counterweight block shell 7112 coats the counterweight block 7111 inside, thereby it is effectively avoided that the counterweight block 7111 is easily rusted and corroded due to direct contact with washing water, and the phenomenon that normal operation of the centrifugal drainage mechanism 70 is not influenced. The counterweight block shell 7112 can also play a role of protection, to avoid the counterweight block 7111 from being damaged during centrifugal movement.

[0122] As shown in Fig. 1, Fig. 2 and Fig. 5, one end of the connecting part 712 of the centrifugal drainage mechanism 70 is connected with the counterweight block shell 7112, the other end is rotatably connected with the valve plug component 72, the middle part of the connecting part 712 is rotatably supported and fixed, to form a lever structure. The connecting part 712 is fixedly connected with the counterweight block shell 7112, which is easier to process and shape in compare with the case in which the connecting part 712 is directly connected with the counterweight block 7111, . The counterweight block 7111 moves under the effect of a centrifugal force, to drive the valve plug component 72 to be operated to open the drainage outlet 401 on the inner drum 40 for drainage.

[0123] Further, as shown in Fig. 1 and Fig. 2, the connecting part 712 is gradually expanded from one end connected with the valve plug component 72 to the other end connected with the counterweight block shell 7112. Through the arrangement of expansion of the valve plug component 72 from one end connected with the connecting part 712 to the other end connected with the counterweight block shell 7112, the connecting area between the connecting part 712 and the counterweight block shell 7112 is increased, such that the strength between the connecting part 712 and the counterweight block shell 7112 is higher and the stability is better.

[0124] Further, in the present embodiment, the connecting part 712 is a plate-shaped structure with a triangular section. One side edge of the connecting part 712 is fixedly connected to the side wall, close to the valve plug component 72, of the counterweight block shell 7112.

[0125] The connecting part 712 can be in the shape of a right angled triangle. One right-angle side of the connecting part 712 is fixedly connected to an outer wall surface of the counterweight block shell 7112. The width of the connecting part 712 is gradually increased from one end connected with the valve plug component 72 to the other end connected with the counterweight block shell 7112. The stability of the triangle is higher, and the connecting area between the connecting part 712 and the counterweight block shell 7112 is larger, and the stability is higher.

[0126] Preferably, the longitudinal section of the con-

necting part 712 is of a triangular shape, and the connecting part 712 is a triangular plate-shaped structure in longitudinal direction, Compared with the connecting part 712 with triangular plate-shaped structure in horizontal direction, the activity space needing to be reserved is the minimum for the connecting part 712 rotating up and down along with the counterweight part 711, thereby improving the space utilization rate of the lifting shell 50.

[0127] Further, in combination with what is shown in Fig. 1 and Fig. 5, a reinforcing configured to improve strength are arranged at the position where the connecting part 712 is connected with the counterweight block shell 7112, and the reinforcing structure is a reinforcing rib 7121 with a plate shape and is connected with the connecting part 712 and the counterweight block shell 7112.

[0128] Preferably, at least two reinforcing ribs 7121 with a plate shape are provided, and are arranged on the left and right sides of the connecting part 712. The reinforcing rib 7121 with a plate shape is of a triangular shape, and adjacent sides are respectively connected to the connecting part 712 and the counterweight block shell 7112.

[0129] Through arrangement of the reinforcing ribs 7121 with a plate shape at two sides of the connecting part 712, strength at the connecting point between the connecting part 712 and the counterweight block shell 7112 is further strengthened, thereby effectively avoiding fracture at the connecting position between the connecting part 712 and the counterweight part 711.

[0130] Further, as shown in Fig. 5, the connecting part 712 is provided with an extending connecting rib 7122 which is arranged in a protruding manner, and the extending connecting rib 7122 is formed by extending an upper edge of the connecting part 712 towards the counterweight part 711. The extending connecting rib 7122 has a certain length, and a lower side of the extending connecting rib 7122 is fixedly connected with an upper side wall of the counterweight block shell 7112.

[0131] Due to the fixed connection of the upper side of the counterweight block shell 7112 with the extending connecting rib 7122, the counterweight block shell 7112 is fixedly connected via the upper side and right side of the counterweight block shell 7112, thereby further enhancing reliability of connection between the connecting part 712 and the counterweight block shell 7112.

[0132] Further, in the present embodiment, the counterweight block shell 7112 is fixedly connected with the connecting part 712 through melting or bonding. Preferably, the counterweight block shell 7112 is injection molded with the connecting part 712, and the counterweight block shell 7112 and the connecting part 712 are integrated injection molded parts.

[0133] Further, the counterweight block shell 7112 is provided with an accommodation cavity which is enclosed and configured to accommodate the counterweight block 7111. The counterweight block 7111 is made of metal materials, the counterweight block shell 7112 is made of corrosion-resistant non-metal materials,

and the counterweight block shell 7112 cannot be rusted and corroded.

[0134] Preferably, the counterweight block shell 7112 is made of high-hardness plastic material, and has not only good corrosion resistance but also strong weight, thereby reducing the load on the inner drum 40.

[0135] Further, along a length direction of the counterweight block 7111, the counterweight block shell 7112 includes side walls forming a structure with two ends being open, and a first end side wall and a second end side wall which are arranged on two ends of the side walls. One end of the connecting part 712 is fixedly connected to the first end side wall/the second end side wall.

[0136] The side walls of the counterweight block shell 7112 include a first side wall, a second side wall, a third side wall and a fourth side wall which are connected end to end, and the connecting positions between the first side wall, the second side wall, the third side wall and the fourth side wall are in smooth and transitional connection. Adjacent side walls are in smooth and transitional connection, not right-angled connection, so it is not easily scratched with other parts.

[0137] Further, in an implementation, there is a clearance between the counterweight block shell 7112 and the outer wall of the counterweight block 7111, and the clearance is internally filled with sealing medium. Through filling the sealing medium into the clearance between the counterweight block shell 7112 and the outer wall of the counterweight block 7111, the probability that washing water enters into the accommodation cavity of the counterweight block shell 7112 and contacts with the counterweight block 7111 is further reduced.

[0138] Preferably, the sealing medium is colloidal, and the clearance between the counterweight block 7111 and the counterweight block shell 7112 is filled with glue to bond the counterweight block 7111 and the counterweight block shell 7112 into a whole. The glue as the sealing medium plays a role of sealing, and fixed connection. The counterweight block 7111 is bonded with the counterweight block shell 7112, and the counterweight block 7111 is prevented from shaking up and down in the counterweight block shell 7112.

[0139] The present embodiment further provides a washing machine with the above centrifugal drainage mechanisms 70, including:

an inner drum 40, configured to independently accommodate washing water in washing laundry;
a laundry lifting device, wherein the laundry lifting device is installed on a drainage outlet 401 of the inner wall of the inner drum 40; and
the centrifugal drainage mechanism 70 is installed in the lifting shell 50 of the laundry lifting device to close the drainage outlet 401, and the centrifugal drainage mechanism 70 can open the drainage outlet 401 for drainage under the effect of a centrifugal force.

Embodiment 3

[0140] The present embodiment provides a laundry lifting device for a washing machine based on Embodiment 1 and/or Embodiment 2, which mainly solves the problem of noise generated when the counterweight part 711 of the centrifugal drainage mechanism 70 easily hits the inner drum 40 or the side wall of the installation cavity 501 during movement.

[0141] As shown in Fig. 1 to Fig. 6, the present embodiment provides a laundry lifting device for a washing machine, including:

a lifting shell 50, internally provided with a cavity with an opening;

a centrifugal drainage mechanism 70, arranged inside the lifting shell 50, and including a centrifugal component 71 and a valve plug component 72 connected with the centrifugal component 71; wherein, the centrifugal component 71 includes a counterweight part 711 which can move under the effect of a centrifugal force, and the movement of counterweight part 711 drives the valve plug component 72 to operate;

an installation cavity 501, being inside the cavity of the lifting shell 50 and for installing the centrifugal drainage mechanism 70, and a buffer structure is arranged inside the installation cavity 501 and/or on the counterweight part 711.

[0142] In the laundry lifting device for a washing machine provided in the present invention, through the arrangement of a buffer structure inside the installation cavity 501 in the lifting shell 50 and/or arranged on the counterweight part 711, it is effectively avoided to generate noise caused by the counterweight part 711 hitting the inner drum 40 or the side wall of the installation cavity 501 during the movement of the counterweight part 711, user experience is not influenced. The buffer structure can also protect the counterweight part 711, and the service life of the centrifugal drainage mechanism 70 is prolonged.

[0143] Further, an encapsulating baffle plate 60 is installed at the position close to the opening inside the lifting shell 50. An installation cavity 501 configured to install the centrifugal component 71 is separated off by the encapsulating baffle plate 60 and arranged on the upper part of the cavity of the lifting shell 50. The configuration, the arrangement manner and effect of the installation cavity 501 and the encapsulating baffle plate 60 are the same as those in Embodiment 1, and should not be repeated redundantly herein.

[0144] As shown in Fig. 1 to Fig. 5, the centrifugal component 71 is arranged inside the installation cavity 501 above the encapsulating baffle plate 60. The buffer structure includes a first pressed structure 604 which is concave outwards corresponding to the position of the counterweight part 711 on the encapsulating baffle plate 60.

The first pressed structure 604, which is concave downwards and formed on the encapsulating baffle plate 60, provides a larger buffer space for downward movement of the counterweight part 711, thereby avoiding the greater noise caused by the counterweight part 711 hitting the encapsulating baffle plate 60 due to the limited activity space of the counterweight part 711.

[0145] Further, the first pressed structure 604 includes a circumferential wall and a bottom wall 6044 which protrude out of the lower surface of the encapsulating baffle plate 60. The shape and size of the bottom wall 6044 are adapted to the shape and size of the cross section of the counterweight part 711. The first pressed structure 604 provides a sufficient buffer space for the entire counterweight part 711, thereby avoiding noise generated by hitting the encapsulating baffle plate 60, while the counterweight part 711 is protected.

[0146] Further, the centrifugal drainage mechanism 70 further includes a valve plug component 72 connected with the counterweight part 711 through a lever structure, the counterweight part 711 moves under the effect of a centrifugal force to drive the valve plug component 72 to operate to open the drainage outlet 401 on the inner drum 40 for drainage. The lever structure is as the connecting part 712 described in Embodiment 1 or Embodiment 2, and the specific structure and effect are not repeated redundantly herein.

[0147] As shown in Fig. 3 and Fig. 4, a buffer cone angle 6043 for avoiding the lever structure is arranged in an extending manner on the side, close to the valve plug component 72, of the first pressed structure 604. The cross section of the first pressed structure 604 is of a shape similar to a pencil stub. A top angle structure which is gradually inclined towards the valve plug component 72 is arranged at the position of the first pressed structure 604 corresponding to the lever structure, to form the buffer cone angle 6043. The lever structure can be avoided through the arrangement of the buffer cone angle 6043, so the first pressed structure 604 provides a greater buffer space for the counterweight part 711.

[0148] Further, as shown in Fig. 1, Fig. 2, Fig. 5 and Fig. 6, the buffer structure further includes a buffer unfilled angle arranged on the side, far away from the valve plug component 72, of the counterweight part 711. The end, far away from the valve plug component 72, of the counterweight part 711 has a notch for providing a larger buffer space for the downfall of the counterweight part 711. This ensures a sufficient activity space for the centrifugal drainage mechanism 70, to open or close the drainage outlet 401.

[0149] Preferably, in the present embodiment, as shown in Fig. 5 and Fig. 6, the counterweight part 711 is in a shape of a quadrangular prism, and the buffer unfilled corner is a structure by cutting corner 7113 below the end, far away from the valve plug component 72, of the counterweight part 711, and the structure by cutting corner 7113 has an inclined wall surface which extends from the bottom wall of the counterweight part 711 to the left

side end wall of the counterweight part 711.

[0150] Further, as shown in Fig. 1 and Fig. 6, the buffer structure further includes a first buffer pad 713 arranged outside the bottom wall of the counterweight part 711, and the first buffer pad 713 can be made of rubber materials and has favorable elasticity. The design requirement of buffering and protecting the counterweight part 711 is satisfied through the set first buffer pad 713.

[0151] The first buffer pad 713 can be coated outside the whole bottom wall of the counterweight part 711, and the first buffer pad 713 can be fixed on the counterweight part 711 through bonding or clamping.

[0152] Preferably, the bottom wall of the counterweight part 711 includes a horizontal straight wall surface and an inclined wall surface formed by the structure by cutting corner 7113. In order to save materials, the first buffer pad 713 is arranged between the horizontal straight wall surface and the inclined wall surface in a coating manner.

[0153] When the counterweight part 711 falls down, a intersect position between the horizontal straight wall surface and the inclined wall surface is first in contact with the encapsulating baffle plate 60. Therefore, by adopting the above design, the intersect position between the horizontal straight wall surface and the inclined wall surface is coated in the first buffer pad 713, which reduces materials to the greatest extent and play a role of effective buffering, damping and protection.

[0154] Alternatively, in another solution, the first buffer pad 713 is arranged outside the inclined wall surface of the structure by cutting corner 7113, and the first buffer pad 713 has an elastic scaling thickness.

[0155] Further, as shown in Fig. 1 to Fig. 6, the buffer structure further includes a second buffer pad 6041 arranged on the bottom wall 6044 of the first pressed structure 604. Due to the arrangement of a second buffer pad 6041 on the bottom wall 6044, the first buffer pad 713, the second buffer pad 6041 and the first pressed structure 604 all play a role of effective buffering and damping when the counterweight part 711 falls down. Thereby it is realized to reduce vibration and noise for the counterweight part 711 from multiple directions.

[0156] Preferably, a buffer pad installation element is arranged on the bottom wall 6044, corresponding to an intersect position between the structure by cutting corner 7113 of the counterweight part 711 and the bottom wall of the counterweight part 711. The second buffer pad 6041 is embedded into the buffer pad installation element, and an upper surface of the second buffer pad 6041 is slightly higher than or is flush with an upper surface of the bottom wall 6044.

[0157] The buffer pad installation element can be an installation hole with a through hollow which is formed on the bottom wall 6044, or can be a blind hole. The second buffer pad 6041 with an annular shape is embedded and extruded within the buffer pad installation element. The second buffer pad does not occupy the space being occupied by the counterweight part 711 in falling process. Meanwhile, when the first pressed structure 604

cannot provide a sufficient buffer space for the counterweight part 711, the second buffer pad 6041 comes into effect to provide a larger buffer space for the counterweight part 711. The counterweight part 711 does not make a greater noise even if the counterweight part 711 hits the second buffer pad 6041, thereby further improving the effect of buffering and noise reduction of the buffer structure.

[0158] Further, as shown in Fig. 1 to Fig. 4, the bottom wall of the first pressed structure 604 is formed with one or more water relief holes 6042 arranged at intervals. If washing water is accumulated in the installation cavity 501 of the lifting shell 50, the accumulated washing water can be timely discharged through the water relief holes 6042. The bottom wall 6044 of the first pressed structure 604 is the lowest position of the entire installation cavity 501, so the water relief holes 6042 are formed on the bottom wall 6044 of the first pressed structure 604, which is more beneficial for water flow to be converged and discharged.

[0159] Preferably, a check valve is installed inside the water relief holes 6042. By the arrangement of the check valve, water inside the installation cavity 501 may be discharged via the water relief holes 6042, while water inside the inner drum 40 cannot enter into the installation cavity 501 through the water relief holes 6042. Thereby the enclosing effect of the installation cavity 501 is ensured.

[0160] Further, in another solution, a second pressed structure which protrudes upwards is arranged at the position, corresponding to the counterweight part 711, on a top wall 51 of the lifting shell 50. The buffer structure further includes a second pressed structure which provides a buffer space for the rising of the counterweight part 711. Through the arrangement of the second pressed structure, it can be effectively avoided making greater noises generated by the counterweight part 711 hitting the top wall 51 of the lifting shell 50 during centrifugal movement.

[0161] Moreover, through the arrangement of the second pressed structure, the initial position of the counterweight part 711 rises, and a greater buffer space can be provided for the downfall of the counterweight part 711.

[0162] The present embodiment further provides a washing machine with the above laundry lifting device, including:

an inner drum 40, configured to independently accommodate washing water in washing laundry, a drainage outlet 401 arranged on a side wall;

a laundry lifting device, installed on an inner wall of the inner drum 40 corresponding to the drainage outlet 401; and

the centrifugal drainage mechanism 70, installed in the lifting shell 50 of the laundry lifting device to close the drainage outlet 401, wherein the centrifugal drainage mechanism 70 can open the drainage outlet 401 for drainage under the effect of a centrifugal force.

Embodiment 4

[0163] In order to solve the problem that the filtration structure arranged inside the existing laundry lifting device cannot achieve an effect of self-cleaning and needs to be cleaned or replaced regularly, the present embodiment mainly describes in detail the filtration structure inside the lifting shell based on a laundry lifting device for a washing machine described in Embodiment 1 to Embodiment 3.

[0164] The present embodiment provides a laundry lifting device. The filtration structure inside the laundry lifting device can be self-cleaned, and can be maintained to be clean without manually cleaning the filtration structure, thereby ensuring the filtering effect.

[0165] As shown in Fig. 1 to Fig. 6, the laundry lifting device provided in the present embodiment includes a lifting shell 50 arranged on an inner wall of the inner drum 4. The lifting shell 50 constitutes an appearance outline of the laundry lifting device, and an inner cavity is formed by the lifting shell 50 and the inner wall of the inner drum 4. The lifting shell 50 is provided with through holes for water flowing in and out, such that water inside the inner drum can flow into the inner cavity of the laundry lifting device through the through holes, and water flow in the inner cavity of the laundry lifting device can flow out of the inner cavity via the through holes. A filtration structure is arranged in the inner cavity, such that water flowing in the inner cavity of the laundry lifting device can be filtered by a filtration structure. A plurality of drainage outlets 401 configured to discharge water inside the inner drum are arranged on the inner wall of the inner drum 4, and the inner cavity at least covers one drainage outlet 401. Therefore, water flow can flow into the inner cavity of the laundry lifting device through the through holes on the lifting shell 50, and water flowing into the inner cavity is discharged through the drainage outlet 401. That is, flow of drainage water in the inner drum includes a drainage path from the through holes to the drainage outlet 401. Since the inner cavity at least covers one drainage outlet 401, the inner cavity includes at least one of the drainage paths. So the drainage path can pass through the filtration structure arranged in the inner cavity. In this way, the filtration structure can be flushed by utilizing drainage water flowing in the drainage path. Thereby it is achieved to flush away impurities to clean the filtration structure by utilizing the drainage water flow, such as thread debris remained on the filtration structure.

[0166] As shown in Fig. 1 to Fig. 3 and Fig. 5 and Fig. 6, the filtration structure arranged inside the filtration cavity 502 is selected from a filter screen, a comb-shaped filtration structure 502 and other structures capable of filtration. In order to flush the filtration structure by water in the inner drum and perform the filtration function of the filtration structure, the position of the filtration structure in the inner cavity should also be proper, where not only filter treatment of the filtration structure is performed, but also impurities such as thread debris remained on the

filtration structure are flushed away. The filtration structure includes a filtration surface configured to intercept impurities in the water flow. After the impurities are filtered by the filtration surface in the filtration process, impurities are adhered onto the filtration surface. In order to ensure a filtering effect of the filtration structure, the water flow needs to flow through the filtration surface to flush the filtration structure. The water flow needs to flow through the filtration surface to flush away impurities such as thread debris remained on the filtration surface. The filtration surface may be a surface of the filter screen, or may be a cross section of the comb-shaped filtration structure 5021 which can block impurities such as thread debris. As shown in the figures, the top wall of the lifting shell 50 is formed with through holes, and each row of comb-shaped bulges all forms a plane configured to intercept impurities and arranged to be parallel to the top wall 51 of the lifting shell 50 which is provided with through holes. The cross section in the filtration structure is taken as filtration surface to intercept impurities such as thread debris. An included angle is formed between the direction of the water flow flowing through the position of the filtration surface in the inner cavity and the filtration surface. In this way, the flushing water flow and the drainage water flow inevitably flows through the filtration surface, so further the flushing water flow is filtered by the filtration section, and the drainage water flow can flush away impurities such as thread debris on the filtration surface.

[0167] Preferably, the direction of the water flow through the position of the filtration surface in the inner cavity is vertical to the filtration surface. Preferably, the flushing water flow and the drainage water flow are vertical to the filtration surface, in this way, the contact area between the drainage water flow and the flushing water flow and the filtration surface is the maximum. Thereby it is more beneficial for filtering the flushing water flow, and impurities are easier to be flushed away by the drainage water flow in the flowing process. Impurities intercepted on the above planes for can be flushed away only by drainage water flow flowing, therefore, the drainage water flow and the flushing water flow at the position of the filtration surface are both intersected with the filtration surface. Or for other types of filtration structures, the drainage water flow and the flushing water flow also need to flow through the position of the filtration surface.

[0168] More preferably, the filtration surface is set to be parallel to the top wall 51 of the lifting shell 50 on which through hole are arranged. The top wall 51 of the lifting shell 50 is provided with through holes for water inlet, and the filtration surface is set to be parallel to the top wall 51, such that water flow through the through holes on the top wall 51 is vertical to the filtration surface. Moreover, both the flushing water flow and the drainage water flow enter the inner cavity through the through holes, and the filtration surface is arranged in parallel to the top wall 51 at which through holes are arranged, such that the drainage water flow entering into the inner cavity easily flushes the filtration surface, and the flushing water flow

entering into the inner cavity can be filtered. Moreover, the filtration surface projects towards the top wall 51, and the projection at least covers part of the through holes on the top wall 51. Preferably, the projection covers all the through holes on the top wall 51. In this way, water flow entering through the through holes on the top wall 51 flows to the filtration surface. As to the filter screen, the filter screen needs to be arranged in parallel to the top wall 51, such that drainage water flow flowing via the through holes of the top wall 51 can directly flow to the filter screen, and it is achieved that the flushing water flow is filtered by the filter screen and the drainage water flow flushes the filter screen.

[0169] More preferably, the filtration surface is arranged at the position close to the top wall 51 in the filtration cavity 502. The through holes for allowing water to pass are arranged on the top wall 51, the filter section is set to be close to the top wall 51, so the filtration section is close to the through holes. The closer the water flow entering into the inner cavity approaches the through holes, the larger the water flow is. Therefore, when the filtration surface is set to be close to the through holes, the filtration surface can be flushed with larger water flow, which is further beneficial for cleaning impurities such as thread debris remained on the filtration structure. Moreover, the water flow rate at the through holes is the highest. When the filtration surface is arranged to be close to the top wall 51 provided with through holes, the filtration surface can filter more water flow entering into the inner cavity, to further achieve a better filtering effect.

[0170] Specifically, a filtration cavity 502 is enclosed by a second baffle plate 612 arranged in the laundry lifting device and configured to guide flow of the drainage water flow and the flushing water flow, the top wall 51 of the lifting shell 50 provided with through holes, and an inner wall of the inner drum 4. The filtration cavity 502 at least covers part of the through holes on the top wall 51, and the filtration structure is arranged in the filtration cavity 502. That is, the filtration cavity 502 is communicated with the through holes of the lifting shell 50 and the drainage outlet 401 on the inner wall of the inner drum 4, to discharge water out of the inner drum. The filtration structure is set in the filtration cavity 502. When water inside the inner drum of a washing machine flows along the filtration cavity 502, the filtration structure in the filtration cavity 502 is cleaned. The position and structure of the laundry lifting device on the inner wall of the inner drum 4 of the present embodiment are set reasonably, such that the inner cavity of the laundry lifting device can constitute a filtration cavity 502 which guides the drainage water flow and the flushing water flow. The flushing water flow can be guided to flow through the filtration structure by the filtration cavity 502, and can be filtered with a filtration structure, and the drainage water flow can be guided to flow through the filtration structure by the filtration cavity 502. In this way, the filtration structure can be cleaned automatically by utilizing the drainage water flow in the inner drum.

[0171] It can be known from the above that, the drainage water flow in the filtration cavity 502 is water supply for cleaning the filtration structure. It should be ensured there is sufficient water flow in the filtration cavity 502 during drainage. Therefore, partition plates can be arranged in the inner cavity of the laundry lifting device, the partition plates can form the filtration cavity 502, such that the filtration cavity 502 formed by the partition plates for drainage can enable the discharged water to flow according to a set trajectory. As shown in Fig. 1, Fig. 2 and Fig. 6, the top wall 51 is connected with a second baffle plate 612 and a third baffle plate 613 to form a filtration cavity 502. The filtration structure is arranged between the second baffle plate 612 and the third baffle plate 613. Preferably, the area arranged between the second baffle plate 612 and the third baffle plate 613 covers all the through holes on the top wall 51. The second baffle plate 612 and the third baffle plate 613 are as the partition plates. Through limiting of the second baffle plate 612 and the third baffle plate 613, the drainage water flow and the flushing water flow can only flow within a space between the second baffle plate 612 and the third baffle plate 613. Thereby it is avoided that the drainage water flow is over divergent when the flowing range of the drainage water flow is too wide. An impact force of the drainage water flow is insufficient to influence the cleaning effect for the filtration structure.

[0172] Since the drainage outlet 401 is arranged outside the second baffle plate 612, the filtration cavity 502 cannot be enclosed by the second baffle plate 612, the top wall 51 and the inner wall of the inner drum 4, and the drainage water flow cannot enter into the drainage outlet 401. Therefore, an opening 5022 at least needs to be arranged in the filtration cavity 502, such that the drainage water flow can flow into the drainage outlet 401 via the opening 5022.

[0173] Specifically as shown in Fig. 1 and Fig. 2, there is a clearance between the end wall of the second baffle plate 612 close to the drainage outlet 401 and the inner wall of the inner drum 4, and the clearance is as the opening 5022 which allows water in the inner cavity to flow into the drainage outlet 401. So the drainage water flow can flow out from the opening 5022, and finally flows to the drainage outlet 401 for drainage. Since the drainage water flow inside the filtration cavity 502 finally needs to flow to the drainage outlet 401 for drainage, a diversion plate 5023 for guiding water to flow to the drainage outlet 401 can be arranged inside the filtration cavity 502. Through the arrangement of the diversion plate 5023, water flow inside the filtration cavity 502 easily gathers at the drainage outlet 401, such that the water flow flowing to the drainage outlet 401 is larger. Therefore, the water which contains impurities such as thread debris can be guided to flow to the drainage outlet 401 for drainage by the diversion plate 5023 after the filtration structure is cleaned. The water contains impurities such as thread debris which blocks the flowing of the water after the filtration structure is cleaned. The diversion plate 5023 en-

ables the water flow to be more gathered, and water flow flowing to the drainage outlet 401 is larger, such that thread debris is easily discharged out from the drainage outlet 401.

[0174] Specifically as shown in Fig. 1 to Fig. 3 and Fig. 5, the diversion plate 5023 is an inclined structure which gradually inclines from the third baffle plate 613 towards the opening 5022 below the second baffle plate 612, which is more beneficial for the drainage water flow to flow to the drainage outlet 401 along the inclined diversion plate 5023.

[0175] Moreover, the inclined structure of the diversion plate 5023 can improve flow velocity of the drainage water flow, and is easier to flush away impurities such as thread debris in the drainage water flow. Preferably, all the diversion plates 5023 is a conical surface with a conical tip pointing towards the drainage outlet 401. A conical surface of the inclined diversion plate 5023 makes the area of the section flowing to the drainage outlet 401 be gradually reduced, such that the flow velocity of the water flow flowing to the drainage outlet 401 is accelerated. Thereby it is more beneficial to discharge the water carrying thread debris through the drainage outlet 401.

[0176] As to the laundry lifting device provided in the present embodiment, the structure inside the laundry lifting device is reasonably arranged, such that the flushing water flow entering into the laundry lifting device can be filtered through the filtration structure, and the drainage water flow cleans the filtration structure inside the laundry lifting device. So it is achieved to flush impurities such as thread debris remained on the filtration structure, and ensure a filtering effect of the filtration structure. That is, the filtration structure in the laundry lifting device provided in the present invention can be self-cleaned, no need to be manually cleaned, because the drainage water inside the inner drum 40 can be utilized to realize self-cleaning of the filtration structure.

[0177] The implementing solutions in the above embodiments can be further combined or substituted, moreover, the embodiments merely describe preferred embodiments of the present invention, rather than limiting the concept and scope of the present invention, and under the premise of not departing from the design idea of the present invention, various changes and improvements made to the technical solution of the present invention by those skilled in the art shall all fall within the protection scope of the present invention.

Claims

1. A laundry lifting device for a washing machine, including:
 - a lifting shell, internally provided with a cavity having an opening;
 - a centrifugal drainage mechanism, installed in the lifting shell, wherein an initial state of the

centrifugal drainage mechanism is a closed state, and the centrifugal drainage mechanism is operated for drainage under a centrifugal force; and

an independently enclosed installation cavity, being separated in the cavity of the lifting shell, and the centrifugal drainage mechanism being at least partially installed in the installation cavity.

2. The laundry lifting device for a washing machine according to claim 1, wherein,

partition plates are fixedly arranged inside the lifting shell, the partition plates include partition baffle plates and an encapsulating baffle plate; the partition baffle plates separate the cavity of the lifting shell to form an installation cavity with an opening on a lower end, and the encapsulating baffle plate is installed on the opening of the lower end to form the installation cavity being independent and enclosed, and a centrifugal component of the centrifugal drainage mechanism is arranged inside the installation cavity.

3. The laundry lifting device for a washing machine according to claim 2, wherein,

the lifting shell includes a top wall and a circumferential side wall being connected between the top wall and an inner wall of an inner drum of a washing machine, a distance between the encapsulating baffle plate and the top wall of the lifting shell is less than a distance between the top wall of the lifting shell and the inner wall of the inner drum, and there is a clearance space between a bottom surface of the encapsulating baffle plate and the inner wall of the inner drum; the partition baffle plates include a first baffle plate and a second baffle plate which are oppositely arranged inside the lifting shell in a length direction of the lifting shell, the first baffle plate and the second baffle plate are respectively connected to the top wall and the circumferential side wall of the lifting shell, and a distance between the first baffle plate and the second baffle plate is less than a length of the lifting shell.

4. The laundry lifting device for a washing machine according to claim 3, wherein,

the circumferential side wall includes a first side wall and a second side wall which are connected to two long sides of the top wall, a lower end of the first side wall and a lower end of the second side wall are at least partially provide with notches to form water inlets for allowing water flowing

in, and the water inlets are communicated with a drainage outlet on the inner drum with a cavity inside the inner drum;

the encapsulating baffle plate is embedded into the notches of the first side wall and the second side wall, and lower surfaces of both sides of the encapsulating baffle plate corresponding to the water inlets are provided with special-shaped grid baffle ribs through which water flows to be drained at a bending angle; preferably, the special-shaped grid baffle ribs are arranged at intervals in two long sides of the encapsulating baffle plate.

5. The laundry lifting device for a washing machine according to claim 4, wherein,

the special-shaped grid baffle ribs are arc-shaped grid ribs with curved bending angles; or the special-shaped grid baffle ribs are folded grid ribs with straight lines included angles; or, the special-shaped grid baffle ribs include longitudinal ribs and a plurality of guiding ribs arranged on both sides of the longitudinal ribs, and the guiding ribs on two adjacent longitudinal ribs are arranged in a staggered manner.

6. The laundry lifting device for a washing machine according to claim 5, wherein,

a diversion channel is formed in the clearance space between two adjacent special-shaped grid baffle ribs, so that the diversion channel forms an arc-shaped reversing diversion channel from an the inlet to an outlet due to the bending angle; ends of the special-shaped grid baffle ribs at the outlet bend or fold towards the drainage outlet, to guide the drainage water flow to converge towards the drainage outlet; preferably, each of the arc-shaped grid ribs has a plurality of curved bending angles, each of the folded grid ribs has a plurality of straight line included angles; or, the arc-shaped grid ribs or the folded grid ribs are of a multi-layered structure in which an upper layer and a lower layer are arranged in a staggered manner.

7. The laundry lifting device for a washing machine according to any one of claims 3-6, wherein,

a second spacing space is formed by an outer surface of the partition plate, the inner wall of the lifting shell and the inner wall of the inner drum on the periphery of the drainage outlet, the second spacing space is respectively communicated with the interior of the inner drum and the drainage outlet formed on the inner drum,

so water inside the inner drum flows through the second spacing space and is discharged via the drainage outlet;

preferably, the second spacing space includes a drainage cavity arranged below the encapsulating baffle plate, the installation cavity is arranged at a position close to an end part of the lifting shell, and the second spacing space further includes a filtration cavity constituted by an outer side of the first baffle plate or the second baffle plate and the inner wall of the lifting shell.

8. The laundry lifting device for a washing machine according to any one of claims 3-6, wherein,

the centrifugal drainage mechanism further includes a valve plug component, the valve plug component includes a valve plunger arranged coaxially with the drainage outlet and a valve plug connected to a lower end of the valve plunger, and

a valve plug through hole for allowing the valve plunger to pass through is formed at the position corresponding to the drainage outlet on the encapsulating baffle plate;

the centrifugal component includes a counterweight part and a connecting part arranged in the installation cavity, one end of the connecting part is fixedly connected with the counterweight part, the other end is hinged with an upper end of the valve plunger, a middle part is rotatably supported and fixed to form a lever structure, and a hinged point between the connecting part and the valve plunger is located within the installation cavity;

preferably, an installation seat with a sleeve shape is installed on upper side of the encapsulating baffle plate, a through hole inside the installation seat is arranged coaxially with the valve plug through hole on the encapsulating baffle plate, the valve plunger is arranged within the installation seat, and a water sealed structure is arranged on the valve plunger and/or the installation seat.

9. The laundry lifting device for a washing machine according to any one of claims 3-6, wherein,

a bolt hole is formed on the encapsulating baffle plate, a stud is injection molded on the inner wall of the lifting shell, a bolt is configured to pass through the bolt hole of the encapsulating baffle plate and be in threaded connection with the stud, to install the encapsulating baffle plate on the opening of the lower ends of the partition baffle plates in a fastening manner;

preferably, the encapsulating baffle plate is provided with a first flange/a second flange which

is abutted against and in match with the first baffle plate/the second baffle plate.

10. The laundry lifting device for a washing machine according to any one of claims 1-9, wherein,

the centrifugal drainage mechanism includes a centrifugal component and a valve plug component connected with the centrifugal component; the centrifugal component includes a counterweight part being capable of moving under a centrifugal force, and the movement of the counterweight part drives the valve plug component to operate;

an installation cavity configured to install the centrifugal drainage mechanism is arranged inside the cavity of the lifting shell, and a buffer structure is arranged inside the installation cavity and/or on the counterweight part.

11. The laundry lifting device for a washing machine according to claim 10, wherein,

the encapsulating baffle plate is installed at the position, close to the opening, inside the lifting shell, and an installation cavity configured to install the centrifugal component is separated out on an upper of the cavity of the lifting shell by the encapsulating baffle plate;

the centrifugal component is arranged inside the installation cavity arranged above the encapsulating baffle plate, and the buffer structure includes a first pressed structure which is convex outwards on a position of the encapsulating baffle plate corresponding to the counterweight part.

12. The laundry lifting device for a washing machine according to claim 11, wherein,

the first pressed structure includes circumferential walls and a bottom wall which protrude out of a lower surface of the encapsulating baffle plate, and

the shape and size of the bottom wall are matched with the shape and size of the cross section of the counterweight part.

13. The laundry lifting device for a washing machine according to claim 11 or 12, wherein,

the centrifugal drainage mechanism further includes the valve plug component connected with the counterweight part through the lever structure, and a buffer cone angle used for avoiding the lever structure is arranged in an extending manner on the side, close to the valve plug component, of the first pressed structure;

the counterweight part is driven to move under the centrifugal force, to drive the valve plug component to operate to open the drainage outlet on the inner drum for drainage.

14. The laundry lifting device for a washing machine according to any one of claims 10-13, wherein,

the centrifugal drainage mechanism further includes the valve plug component connected with the counterweight part through the lever structure, and a cutting corner for buffering is arranged on an end of the side, far away from the valve plug component, of the counterweight part to form the buffer structure; preferably, the counterweight part is in a shape of a quadrangular prism, and the cutting corner for buffering is a cutting corner structure on the lower end, far away from the valve plug component, of the counterweight part.

15. The laundry lifting device for a washing machine according to any one of claims 10-14, wherein,

the buffer structure further includes a first buffer pad arranged outside a bottom wall of the counterweight part; preferably, a cutting corner structure is arranged on the lower end, far away from the valve plug component, of the counterweight part, the bottom wall of the counterweight part includes a horizontal straight wall surface and an inclined wall surface formed by the cutting corner structure, and the first buffer pad is arranged on the position between the horizontal straight wall surface and the inclined wall surface in a coating manner.

16. The laundry lifting device for a washing machine according to claim 15, wherein,

the buffer structure further includes a second buffer pad arranged on the bottom wall of the first pressed structure; preferably, a buffer pad installation position is arranged on the bottom wall of the first pressed structure corresponding to an intersected position between the cutting corner structure of the counterweight part and the bottom wall of the counterweight part, the second buffer pad is embedded in the buffer pad installation position, and an upper surface of the second buffer pad is slightly higher than or is flush with an upper surface of the bottom wall.

17. The laundry lifting device for a washing machine according to any one of claims 11-16, wherein,

the bottom wall of the first pressed structure is provided with one or more pressure relief holes arranged at intervals; preferably, a check valve is installed within the pressure relief hole.

18. The laundry lifting device for a washing machine according to any one of claims 10-17, wherein, a second pressed structure protruding upwards is arranged on a top wall of the lifting shell corresponding to the counterweight part, and the buffer structure further includes the second pressed structure providing a buffer space in rising of the counterweight part.

19. A washing machine having the laundry lifting device according to any one of claims 1-18, including,

an inner drum;
an inner drum door, installed on an opening of the inner drum in an openable and closable manner, wherein an independent washing cavity for independently accommodating washing water in washing laundry is formed by the inner drum door and the inner drum when the inner drum door is in close, to;
a drainage outlet, arranged on a side wall of the inner drum, wherein,
the laundry lifting device is installed on a drainage outlet of an inner wall of the inner drum, and the centrifugal drainage mechanism is configured to close/open the drainage outlet.

20. A centrifugal drainage mechanism, including,

a centrifugal component and a valve plug component, wherein, the centrifugal component includes a counterweight part and a connecting part, and the counterweight part includes a counterweight block shell and a counterweight block arranged inside the counterweight block shell;
one end of the connecting part is connected with the counterweight block shell, another end is rotatably connected with the valve plug component, and a middle part can be rotatably supported and fixed, to form a lever structure;
the counterweight block is driven to move under a centrifugal force, to drive the valve plug component to operate to open the drainage outlet on the inner drum for drainage.

21. The centrifugal drainage mechanism according to claim 20, wherein,

one end of the connecting part connected with the valve plug component is gradually enlarged towards the other end connected with the counterweight block shell.

- 22.** The centrifugal drainage mechanism according to claim 20 or 21, wherein,

the connecting part is a plate structure with a cross section of a triangular shape, and one side edge of the connecting part is fixedly connected to a side wall, close to the valve plug component, of the counterweight block shell; and preferably, a longitudinal section of the connecting part is of a triangular shape.

- 23.** The centrifugal drainage mechanism according to claim 22, wherein,

a reinforcing structure for improving strength is arranged at the position at which the connecting part is connected with the counterweight block shell, and the reinforcing structure is a reinforcing rib with plate shape being connected with the connecting part and the counterweight block shell; preferably, at least two reinforcing ribs with plate shape are provided, and the reinforcing ribs with plate shape are arranged on left and right sides of the connecting part.

- 24.** The centrifugal drainage mechanism according to claim 22, wherein, the connecting part is provided with an extending connecting rib which is arranged in a protruding manner, and the extending connecting rib is formed by extending an upper edge of the connecting part towards the counterweight part; the extending connecting rib has an extending length, and the lower side of the extending connecting rib is fixedly connected with an upper side wall of the counterweight block shell.

- 25.** The centrifugal drainage mechanism according to any one of claims 20-24, wherein, the counterweight block shell and the connecting part are integrally molded through injection molding.

- 26.** The centrifugal drainage mechanism according to any one of claims 20-24, wherein, the counterweight block is made of metal materials, and the counterweight block shell is made of non-metallic materials with corrosion-resistant; preferably, the counterweight block shell is made of plastic materials.

- 27.** The centrifugal drainage mechanism according to any one of claims 20-24, wherein, along a length direction of the counterweight block, the counterweight block shell includes circumferential side walls enclosing a structure with the openings on two ends, a first end wall and a second end wall which are arranged on two ends of the structure, and one end of the connecting part is fixedly connected onto the

first end side wall/the second end side wall; the circumferential side walls include a first side wall, a second side wall, a third side wall and a fourth side wall which are connected in sequence from end to end, and the connecting positions among the first side wall, the second side wall, the third side wall and the fourth side wall are in smooth and transitional connection.

- 28.** The centrifugal drainage mechanism according to any one of claims 20-27, wherein, there is a clearance between the counterweight block shell and the counterweight block, and the clearance is filled with sealing medium; preferably, the sealing medium is colloidal, the clearance between the counterweight block and the counterweight block shell is filled with glue to bond the counterweight block and the counterweight block shell into a whole.

- 29.** A washing machine having the centrifugal drainage mechanism according to any one of claims 20-28, including,

an inner drum, configured to independently accommodate washing water in washing laundry; a laundry lifting device, installed on a drainage outlet of the inner wall of the inner drum; wherein, the centrifugal drainage mechanism is installed in the lifting shell of the laundry lifting device to block and close the drainage outlet, and the centrifugal drainage mechanism opens the drainage outlet for drainage under a centrifugal force.

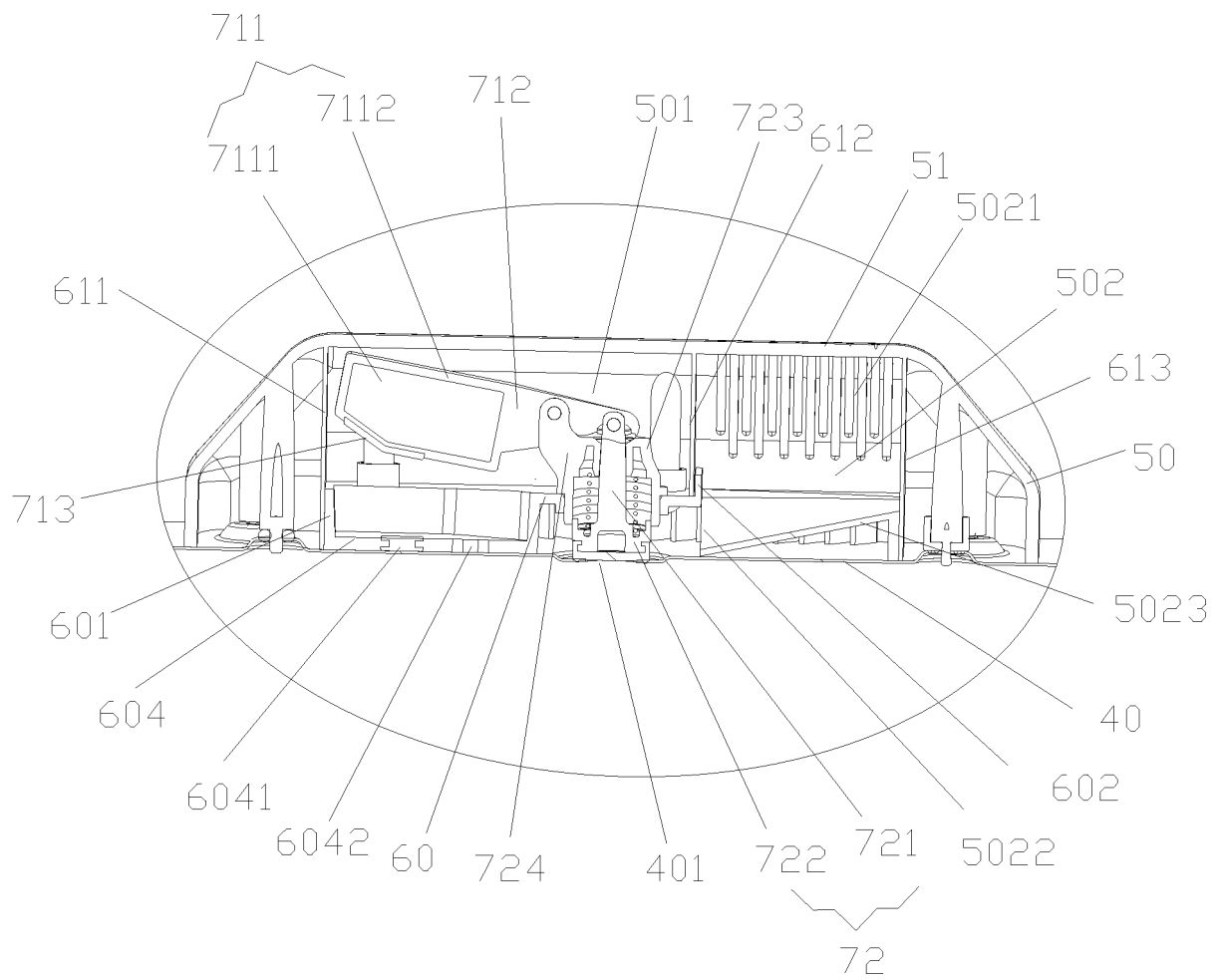


Fig. 1

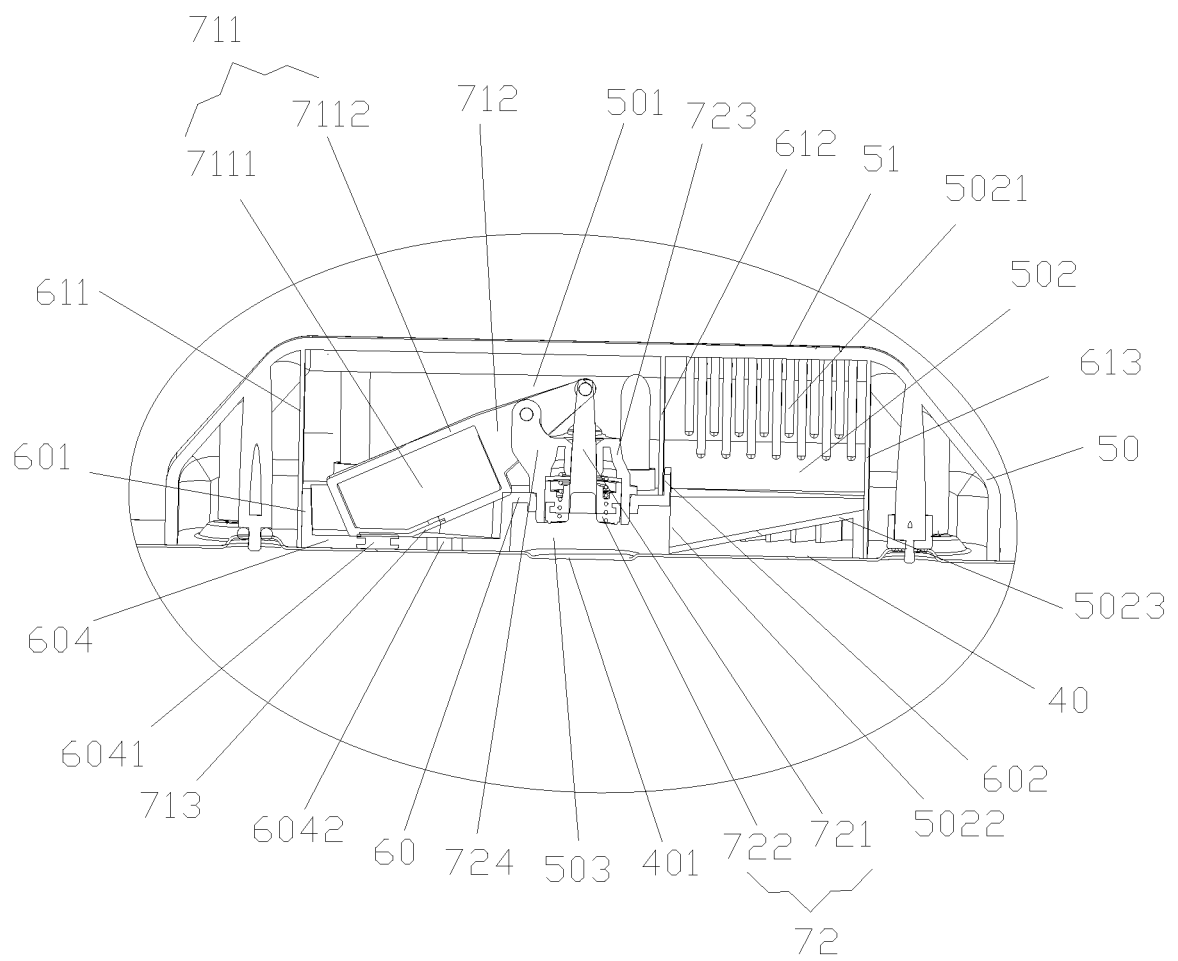


Fig. 2

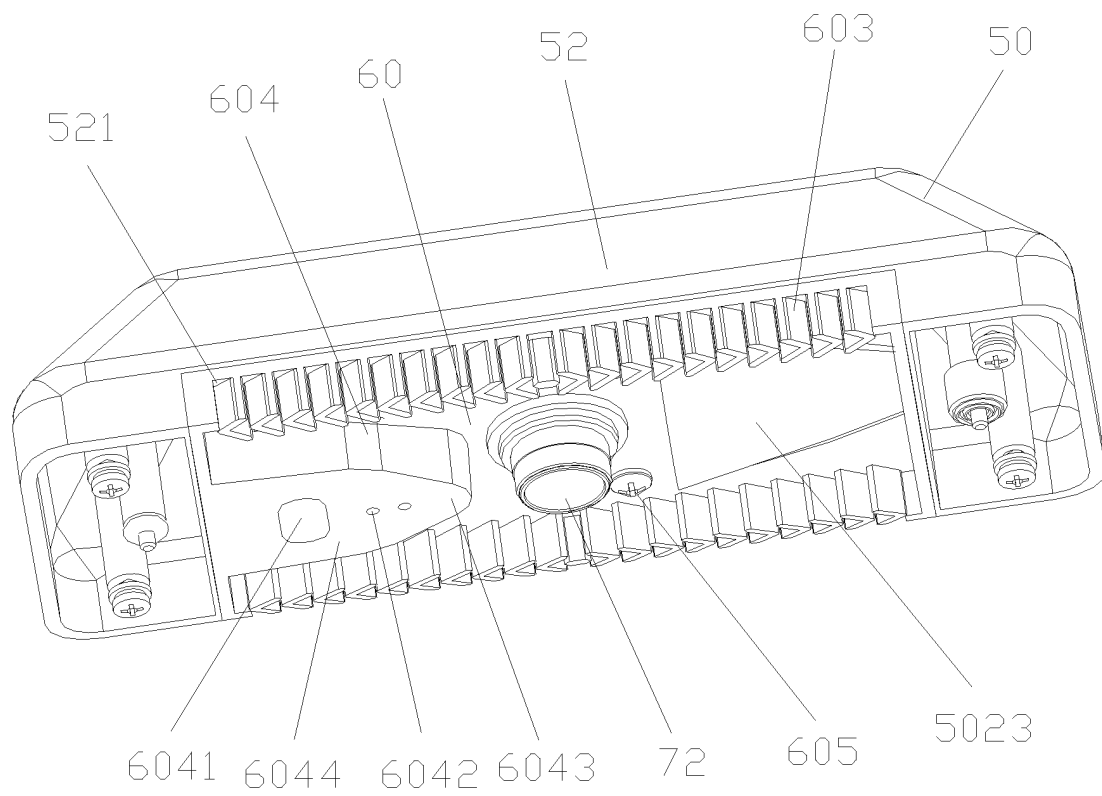


Fig. 3

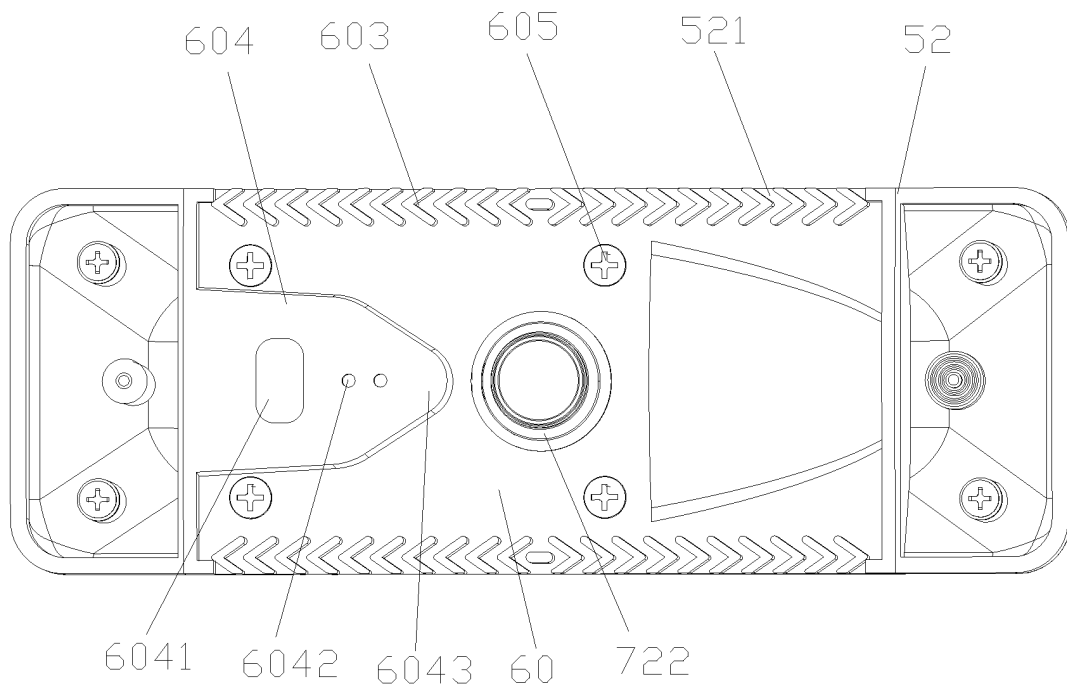


Fig. 4

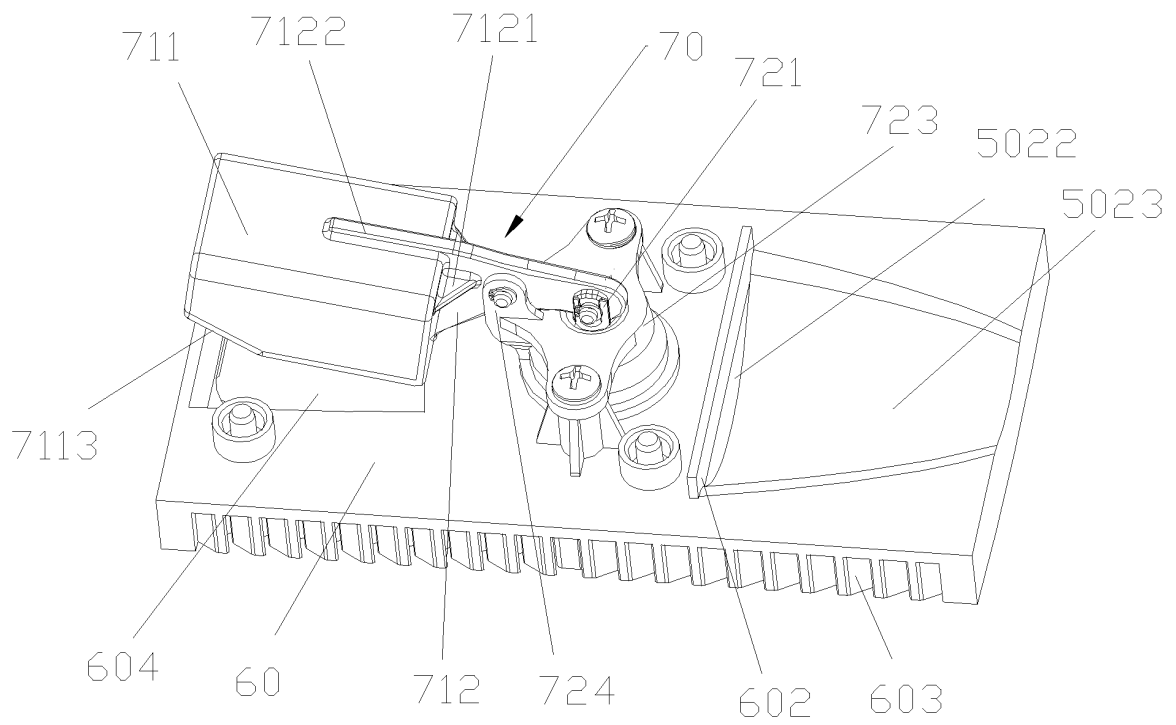


Fig. 5

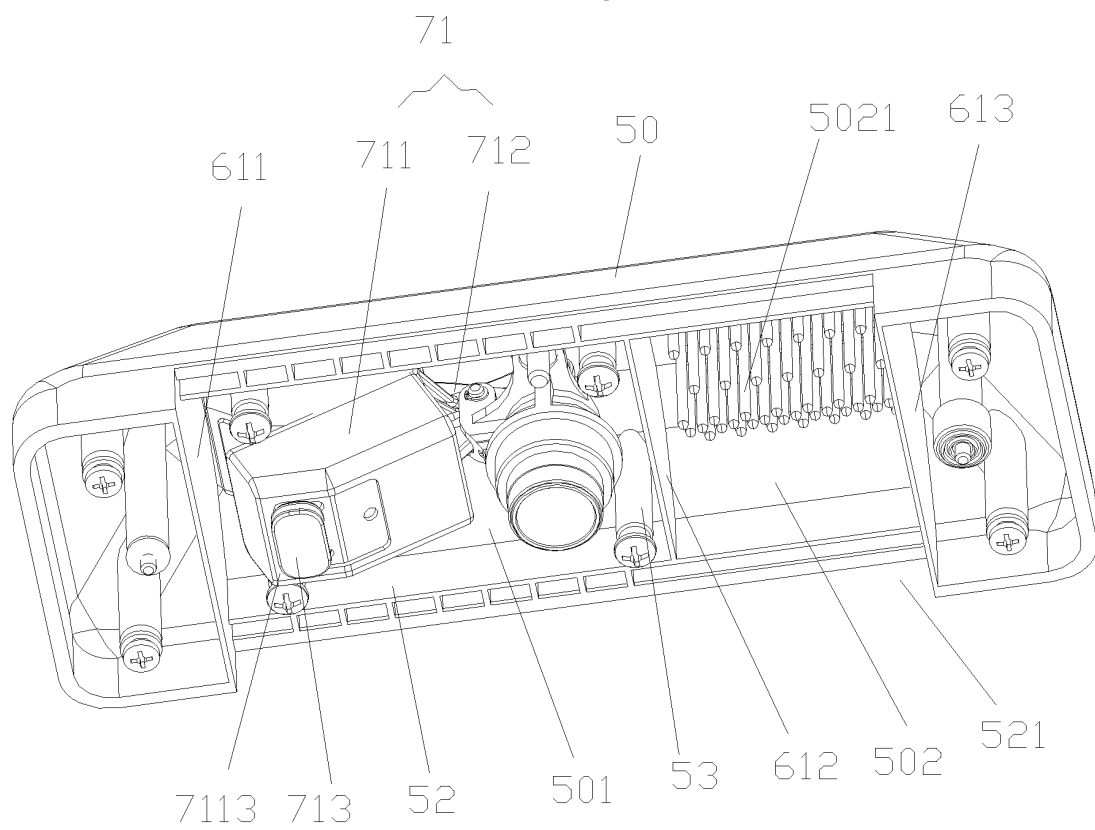


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2021/127925

A. CLASSIFICATION OF SUBJECT MATTER

D06F 39/08(2006.01)i

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

WPI, EPODOC, CNKI, CNPAT: 内筒, 滚筒, 提升, 离心, 排水, 缠, 绕, 堵, 阀, 配重, 质量, 密封, 封闭, 隔离, valve, lift, centrifugal, wind, block, drain, weight, seal, close

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
PX	CN 113106703 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.; HAIER SMART HOME CO., LTD.) 13 July 2021 (2021-07-13) description, paragraphs 41-116, figures 1-8	20-29
PX	CN 213596643 U (WUXI LITTLE SWAN ELECTRICAL APPLIANCE CO., LTD.) 02 July 2021 (2021-07-02) description, paragraphs 35-74, figures 1-7	1, 10, 19
X	CN 111691130 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.; QINGDAO HAIER CO., LTD.) 22 September 2020 (2020-09-22) description, paragraphs 49-229, figures 1-25	20-29
A	CN 111691130 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.; QINGDAO HAIER CO., LTD.) 22 September 2020 (2020-09-22) description, paragraphs 49-229, figures 1-25	1-19
X	CN 111691148 A (QINGDAO HAIER DRUM WASHING MACHINE CO., LTD.; QINGDAO HAIER CO., LTD.) 22 September 2020 (2020-09-22) description, paragraphs 48-229, figures 1-25	20-29

☒ Further documents are listed in the continuation of Box C.☒ See patent family annex.

* Special categories of cited documents:

“A” document defining the general state of the art which is not considered to be of particular relevance

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“L” document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

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“P” document published prior to the international filing date but later than the priority date claimed

“T” later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

“X” document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

“Y” document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

“&” document member of the same patent family

Date of the actual completion of the international search

10 January 2022

Date of mailing of the international search report

26 January 2022

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/CN2021/127925

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