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(54) **DISHWASHER**

(57) A dishwasher. A dishwasher (100) comprises: a washing inner container (1), a spray arm (2), a heating device (3), a washing pump (4), and a water collection tank (5). A flow distribution cavity (53), a spray arm port (532), a washing pump port (533), and a second heating device port (534) are provided on the water collection tank (5); a water distribution valve assembly (6) comprises a valve seat (61) and a valve core (62); the valve seat (61) is connected to the water collection tank (5); a first heating device port (611) is provided on the valve seat (61); the valve core (62) is movably provided in the flow distribution cavity (53) so that the spray arm port (532) is switchably communicated with the washing pump port (533) and the second heating device port (534).

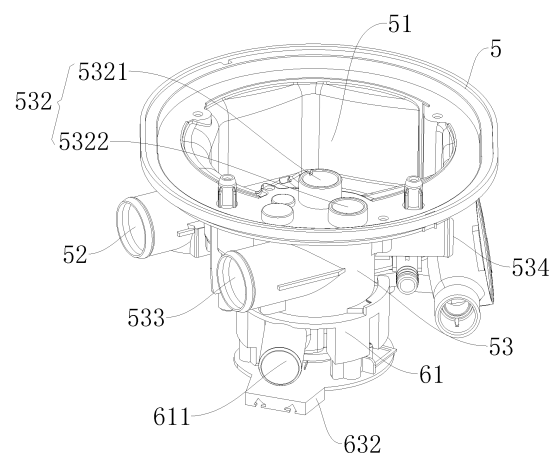


FIG. 2

EP 4 066 719 A1

Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is submitted based on and claims priorities to Chinese Patent Applications No. 201922144503.7 and No. 201911223086.3, both filed on December 3, 2019, the entire disclosures of which are incorporated herein by reference.

TECHNICAL FIELD

[0002] The present disclosure relates to the field of household appliance technologies, and more particularly, to a dishwasher.

BACKGROUND

[0003] In the related art, dishwashers are usually equipped with water heating devices to improve efficiency of washing dishes. Heating water for washing can not only wash away scraps from dishes by high-temperature water for washing but also brings heat to the dishes. A dishwasher system is therefore able to obtain high cleaning efficiency and a high drying rate in a short washing time.

[0004] However, due to limitations on a structure of the system, the water for washing bears a high flow resistance in a channel at a water side when passing through the heating device, which leads to problems of the dishwasher such as a drop in spray pressure of a spray arm, an increase in power consumption of a washing pump, or the like.

[0005] A heating process takes up only a part of total washing time of a dishwasher. Therefore, when a heating system is directly connected to a circulation path of the water for washing, a resistance loss generated when water flows through the heating device during a non-heating period may cause a drop in water spray pressure of the spray arm and a decrease in an amount of water for washing, which leads to poor dishwashing efficiency.

[0006] To solve the above problems, the dishwasher is usually equipped with a water distribution valves configured to control the circulation path of the water for washing to prevent the water for washing from flowing through the heating device during the non-heating period. In this way, a water flow resistance can be reduced and washing performance can be enhanced.

[0007] However, in the related art, the water distribution valve has an independent structure, and thus the water distribution valve and a water collection tank of the dishwasher are connected to each other by many connection pipes, which are not only unfavorable to assembly, but also not results in a uncompact overall structure of the dishwasher.

SUMMARY

[0008] The present disclosure aims to solve at least one of the technical problems in the related art. To this end, embodiments of the present disclosure is to provide a dishwasher. A water distribution valve assembly and a water collection tank of the dishwasher are assembled to form a single structure, which not only requires no connection pipes between the water distribution valve assembly and the water collection tank, but also provides a compact overall structure for the dishwasher.

[0009] According to an embodiment of the present disclosure, a dishwasher includes: an inner washing tub having a washing cavity defined therein; a spray arm disposed in the inner washing tub; a heating device configured to heat water for washing and having a to-be-heated water inlet and a heated water outlet; a washing pump having a washing pump inlet and a washing pump outlet; and a water collection tank disposed at a bottom of the inner washing tub. The water collection tank has a water collection cavity defined therein and in communication with the flow distribution cavity. The water collection cavity has a washing outlet connected to the washing pump outlet. The water collection tank also has a flow distribution cavity having an opening, and a spray arm port, a washing pump port and a second heating device port that are in communication with the washing cavity. The spray arm port is connected to the spray arm. The washing pump port is connected to the washing pump outlet. The second heating device port is connected to the heated water outlet. The dishwasher also includes a water distribution valve assembly. The water distribution valve assembly includes a valve seat having a first heating device port, and a valve core movably disposed in the flow distribution cavity to allow the spray arm port to switch from communicating with the washing pump port to the second heating device port. The valve seat is connected to the water collection tank and configured to close the opening of the flow distribution cavity, and the first heating device port is in communication with the flow distribution cavity and connected to the to-be-heated water inlet. The valve core is configured to: close the first heating device port when the spray arm port is in communication with the washing pump port, and open the first heating device port when the spray arm port is in communication with the second heating device port to allow the washing pump port to be in communication with the first heating device port.

[0010] With the dishwasher according to embodiments of the present disclosure, the water distribution valve assembly and the water collection tank of the dishwasher are assembled to form a single structure, which not only requires no connection pipes between the water distribution valve assembly and the water collection tank, but also provides a compact overall structure for the dishwasher.

[0011] In addition, the dishwasher according to the embodiments of the present disclosure may also have the

following additional technical features.

[0012] According to an embodiment of the present disclosure, the valve core includes a separating plate obliquely disposed in the flow distribution cavity to separate the washing pump port and the second heating device port. The washing pump port and the second heating device port is positioned at opposite sides of the separating plate, respectively. The separating plate has a first surface and a second surface opposite to the first surface. The first surface is normally opposite to the spray arm port, and is switchably opposite to the washing pump port to the second heating device port to allow the spray arm port to switch from communicating with the washing pump port and to the second heating device port.

[0013] According to an embodiment of the present disclosure, the valve core also includes a capping plate disposed at an end of the separating plate. The capping plate is configured to: cap the first heating device port when the first surface is opposite to the washing pump port, and deviate from the first heating device port when the first surface is opposite to the second heating device port.

[0014] According to an embodiment of the present disclosure, the valve core is rotatably disposed in the flow distribution cavity. The water distribution valve assembly also includes a driving mechanism configured to drive the valve core to rotate. The driving mechanism includes: a driving motor; a motor mounting plate disposed on the valve seat, the driving motor is disposed at a side of the motor mounting plate facing away from the valve seat; and a transmission member disposed at a side of the motor mounting plate adjacent to the valve seat. A motor shaft of the driving motor passes through the motor mounting plate to be connected to one end of the transmission member, and another end of the transmission member passes through the valve seat to be connected to the valve core.

[0015] According to an embodiment of the present disclosure, the valve core has a sleeve provided thereon. The other end of the transmission member is engaged in the sleeve.

[0016] According to an embodiment of the present disclosure, a plurality of spray arms and a plurality of spray arm ports are provided. Each of the plurality of spray arm ports is in communication with at least one of the plurality of spray arms. The washing pump port selectively communicates with at least one of the plurality of spray arm ports, or the second heating device port selectively communicates with at least one of the plurality of spray arm ports.

[0017] According to an embodiment of the present disclosure, the water distribution valve assembly also includes a toggle member movably disposed in the flow distribution cavity to open or close the spray arm port.

[0018] According to an embodiment of the present disclosure, the toggle member is of a sector structure. One of the toggle member and the valve core has an engagement protrusion, and the other of the toggle member and

the valve core has an engagement groove. The engagement protrusion is engaged into the engagement groove to allow the toggle member to move along with the valve core.

[0019] According to an embodiment of the present disclosure, the spray arm port includes a first spray arm port and a second spray arm port. Two toggle members are provided and include a first toggle member and a second toggle member. When the washing pump port selectively communicates with at least one of the plurality of spray arm ports, the first toggle member is capable of opening or closing the first spray arm port, and the second toggle member is capable of opening or closing the second spray arm port. When the second heating device port selectively communicates with at least one of the plurality of spray arm ports, the second toggle member is capable of opening or closing the first spray arm port, and the first toggle member is capable of opening or closing the second spray arm port.

[0020] According to an embodiment of the present disclosure, the plurality of spray arms includes: a lower spray arm disposed at a lower part of an inside of the inner washing tub; an upper spray arm disposed at an upper part of the inside of the inner washing tub; and a middle spray arm disposed in a middle part of the inner washing tub. The spray arm port includes a first spray arm port in communication with the lower spray arm, and a second spray arm port in communication with the upper spray arm and the middle spray arm.

[0021] According to an embodiment of the present disclosure, the heating device includes a compressor, a condenser, a throttling device, and an evaporator that are connected end to end sequentially to form a refrigerant cycle.

[0022] Additional aspects and advantages of the present disclosure will be provided at least in part in the following description, or will become apparent at least in part from the following description, or can be learned from practicing of the present disclosure.

BRIEF DESCRIPTION OF DRAWINGS

[0023] The above and/or additional aspects and advantages of the present disclosure will become more apparent and more understandable from the following description of embodiments taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a schematic view of a dishwasher according to an embodiment of the present disclosure, briefly illustrating an entire assembled structure of a water collection tank and a water distribution valve assembly.

FIG. 2 is an assembly view of a water collection tank and a water distribution valve assembly of a dishwasher according to an embodiment of the present disclosure, without a driving motor illustrated.

FIG. 3 is an exploded view of the structure illustrated

in FIG. 2.

FIG. 4 is a perspective view of a water collection tank of a dishwasher according to an embodiment of the present disclosure.

FIG. 5 is a bottom view of a water collection tank of a dishwasher according to an embodiment of the present disclosure.

FIG. 6 is a schematic structural view of a water distribution valve assembly of a dishwasher according to an embodiment of the present disclosure, in which a driving motor is not illustrated and a first heating device port is blocked by a valve core.

FIG. 7 is an exploded view of the structure illustrated in FIG. 6.

FIG. 8 is a schematic structural view of a water distribution valve assembly of a dishwasher according to an embodiment of the present disclosure, in which a first heating device port is opened by a valve core.

FIG. 9 is an exploded view of the structure illustrated in FIG. 8.

[0024] Correspondence between reference signs in FIG. 1 to FIG. 9 and names of individual members is provided below:

dishwasher 100.

inner washing tub 1; washing cavity 11;

spray arm 2; upper spray arm 21; middle spray arm 22; lower spray arm 23;

heating device 3; compressor 31; condenser 32; to-be-heated water inlet 321; heated water outlet 322; throttling device 33; evaporator 34;

washing pump 4; washing pump inlet 41; washing pump outlet 42;

water collection tank 5; water collection cavity 51; washing outlet 52; flow distribution cavity 53; opening 531; spray arm port 532; first spray arm port 5321; second spray arm port 5322; washing pump port 533; second heating device port 534;

water distribution valve assembly 6; valve seat 61; first heating device port 611;

valve core 62; separating plate 621; first surface 6211; second surface 6212; capping plate 622; sleeve 623; engagement groove 624;

driving mechanism 63; driving motor 631; motor mounting plate 632; transmission member 633;

toggle member 64; first toggle member 641; second toggle member 642; engagement protrusion 643;

an entire assembled structure 5-6 of a water collection tank and a water distribution valve assembly.

DESCRIPTION OF EMBODIMENTS

[0025] The embodiments of the present disclosure will be described in detail below with reference to examples thereof as illustrated in the accompanying drawings, throughout which same or similar elements, or elements having same or similar functions, are denoted by same

or similar reference signs. The embodiments described below with reference to the drawings are illustrative only, and are intended to explain, rather than limiting, the present disclosure.

[0026] A dishwasher 100 according to embodiments of the present disclosure will be described below with reference to FIG. 1 to FIG. 9.

[0027] Referring to FIG. 1 to FIG. 9, the dishwasher 100 according to the embodiments of the present disclosure includes an inner washing tub 1, a spray arm 2, a heating device 3 configured to heat water for washing, a washing pump 4, a water collection tank 5, and a water distribution valve assembly 6.

[0028] The inner washing tub 1 has a washing cavity 11 defined therein. A support may be disposed within the washing cavity 11 to support a dish. The spray arm 2 is disposed in the inner washing tub 1, and has a spray inlet defined thereon. Water for washing enters the spray arm 2 via the spray inlet, and then sprayed, via a nozzle disposed on the spray arm 2, to the dish to clean the dish.

[0029] The heating device 3 has a to-be-heated water inlet 321 and a heated water outlet 322, and is configured to heat the water for washing. The water collection tank 5 is disposed at a bottom of the inner washing tub 1. The water collection tank 5 has a water collection cavity 51 defined thereon and a washing outlet 52. The water collection cavity 51 is in communication with the washing cavity 11. The water for washing sprayed onto the dish is collected in the collection cavity 51 of the water collection tank 5 disposed at the bottom of the inner washing tub 1, and flows out of the washing outlet 52. The water collection tank 5 also has a flow distribution cavity 53 with an opening 531, and a spray arm port 532, a washing pump port 533, and a second heating device port 534 that are in communication with the flow distribution cavity 53. The spray arm port 532 is connected to the spray arm 2, and the second heating device port 534 is connected to the heated water outlet 322. The washing pump 4 has a washing pump inlet 41 and a washing pump outlet 42 defined thereon. The washing pump inlet 41 is connected to the washing outlet 52. The washing pump outlet 42 is connected to the washing pump port 533. Circulation of the water for washing is powered by the washing pump 4 that pumps the water for washing from the washing outlet 52 towards the washing pump port 533.

[0030] The water distribution valve assembly 6 includes a valve seat 61 and a valve core 62. The valve seat 61 is connected to the water collection tank 5 and configured to block the opening 531 of the flow distribution cavity 53. In an embodiment, the valve seat 61 is connected to the water collection tank 5 and located at the opening 531 of the flow distribution cavity 53 to block the opening 531. Therefore, a closed flow distribution cavity 53 is formed. The valve seat 61 may be connected to the water collection tank 5 in any manner. In an embodiment, the valve seat 61 may be connected to the water collection tank 5 by an engagement structure; or in an embodiment, the valve seat 61 may be connected

to the water collection tank 5 by a threaded fastener; or in an embodiment, the valve seat 61 and the water collection tank 5 may be formed into one piece. That is, the valve seat 61 and the water collection tank 5 are integrally fabricated.

[0031] The valve seat 61 has a first heating device port 611 defined thereon. The first heating device port 611 is in communication with the flow distribution cavity 53 and connected to the to-be-heated water inlet 321. The valve core 62 is movably disposed in the flow distribution cavity 53 to allow the spray arm port 532 to switch from communicating with the washing pump port 533 to the second heating device port 534. The valve core 62 is capable of closing the first heating device port 611 when the spray arm port 532 is in communication with the washing pump port 533 (as illustrated in FIG. 6 and FIG. 7), and opening the first heating device port 611 to allow the washing pump port 533 to be in communication with the first heating device port 611 when the spray arm port 532 is in communication with the second heating device port 534 (as illustrated in FIG. 8 and FIG. 9).

[0032] By controlling a movement of the valve core 62 within the flow distribution cavity 53, a circulation path of the water for washing may be controlled to prevent the water for washing from flowing through the heating device 3 during a non-heating period and to allow the water for washing to flow through the heating device 3 during a heating period. The circulation path of the water for washing during each of the non-heating period and the heating period will be described below with reference to FIG. 1 to FIG. 9.

[0033] During the non-heating period, the valve core 62 is moved to a position illustrated in FIG. 6 and FIG. 7. In this case, the first heating device port 611 is closed by the valve core 62 when the spray arm port 532 is in communication with the washing pump port 533. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing, instead of entering the heating device 3 via the first heating device port 611, directly enters the spray arm 2 via the spray arm port 532 to realize a circulation of the water for washing during the non-heating period.

[0034] During the heating period, the valve core 62 is moved to a position illustrated in FIG. 8 and FIG. 9. In this case, the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611 when the spray arm port 532 is in communication with the second heating device port 534. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water then enters the spray arm 2 via the second heating device port 534 and the spray arm port 532 sequentially to realize a circulation of the water for washing during the heating period.

[0035] With the dishwasher 100 according to the embodiments of the present disclosure, the water distribu-

tion valve assembly 6 and the water collection tank 5 of the dishwasher 100 are assembled to form an assembled structure 5-6, which can require no connection pipes between the water distribution valve assembly 6 and the water collection tank 5, and can also provide a compact overall structure for the dishwasher 100.

[0036] According to an embodiment of the present disclosure, the valve core 62 includes a separating plate 621 and a capping plate 622. The separating plate 621 is obliquely disposed in the flow distribution cavity 53 to separate the washing pump port 533 and the second heating device port 534. The washing pump port 533 and the second heating device port 534 is positioned at opposite sides of the separating plate 621, respectively, to avoid communication between the washing pump port 533 and the second heating device port 534. The separating plate 621 has a first surface 6211 and a second surface 6212 opposite to the first surface 6211. The first surface 6211 is normally opposite to the spray arm port 532 and switchably opposite to the washing pump port 533 and to the second heating device port 534 to allow the spray arm port 532 to switch from communicating with the washing pump port 533 to the second heating device port 534. In an embodiment, since the first surface 6211 is normally opposite to the spray arm port 532, when the first surface 6211 is opposite to the washing pump port 533, as illustrated in FIG. 6 and FIG. 7, the spray arm port 532 and the washing pump port 533 are located at a same side of the first surface 6211 to allow the spray arm port 532 to be in communication with the washing pump port 533. In addition, when the first surface 6211 is opposite to the second heating device port 534, as illustrated in FIG. 8 and FIG. 9, the spray arm port 532 and the second heating device port 534 are located at a same side of the first surface 6211 to allow the spray arm port 532 to be in communication with the second heating device port 534.

[0037] Further, the valve core 62 also includes the capping plate 622 disposed at an end of the separating plate 621. As illustrated in FIG. 6 to FIG. 9, the capping plate 622 is disposed at a lower end of the separating plate 621. As illustrated in FIG. 6 and FIG. 7, the capping plate 622 is configured to cap the first heating device port 611 when the first surface 6211 is opposite to the washing pump port 533. In this case, water entering the flow distribution cavity 53 via the washing pump port 533 cannot enter, via the first heating device port 611, the heating device 3, but directly enters the spray arm 2 via the spray arm port 532 to realize the circulation of the water for washing during the non-heating period. As illustrated in FIG. 8 and FIG. 9, the capping plate 622 is configured to deviate from the first heating device port 611 to open the first heating device port 611 when the second surface 6212 is opposite to the washing pump port 533. In this case, the water entering the flow distribution cavity 53 via the washing pump port 533 enters, via the first heating device port 611, the heating device 3 to be heated. The heated water enters the spray arm 2 via the second heat-

ing device port 534 and the spray arm port 532 sequentially to realize the circulation of the water for washing during the heating period.

[0038] According to an embodiment of the present disclosure, as illustrated in FIG. 6 to FIG. 9, the valve core 62 is rotatably disposed in the flow distribution cavity 53. That is, the circulation of the water for washing during each of the non-heating period and the heating period can be realized by controlling an angle of rotation of the valve core 62 in the flow distribution cavity 53. The water distribution valve assembly 6, which has a simple structure, also includes a driving mechanism 63 configured to drive the valve core 62 to rotate. The driving mechanism 63 includes a driving motor 631, a motor mounting plate 632, and a transmission member 633. The motor mounting plate 632 is disposed on the valve seat 61. The driving motor 631 is disposed at a side of the motor mounting plate 632 facing away from the valve seat 61. The transmission member 633 is disposed at a side of the motor mounting plate 632 adjacent to the valve seat 61. A motor shaft of the driving motor 631 passes through the motor mounting plate 632 to be connected to one end (e.g., a lower end illustrated in each of FIG. 6 to FIG. 9) of the transmission member 633. The other end (e.g., an upper end illustrated in each of FIG. 6 to FIG. 9) of the transmission member 633 passes through the valve seat 61 to be connected to the valve core 62. The driving motor 631 is capable of driving a rotation of the transmission member 633. The transmission member 633 then transfers the rotation to the valve core 62 to drive the valve core 62 to rotate. The driving mechanism 63 is simple in structure and easy to be mounted.

[0039] Further, as illustrated in FIG. 6 and FIG. 9, the valve core 62 has a sleeve 623 provided thereon. The other end (e.g., the upper end illustrated in each of FIG. 6 to FIG. 9) of the transmission member 633 is engaged within the sleeve 623 to realize a connection between the transmission member 633 and the sleeve 623. The connection has a simple structure.

[0040] According to an embodiment of the present disclosure, a plurality of spray arms 2 may be provided while one spray arm port 532 may be provided. Each of the plurality of spray arms 2 is in communication with the spray arm port 532. In this case, after flowing out of the spray arm port 532, the water for washing may be distributed into the plurality of spray arms 2 to be sprayed. Such a manner provides a better cleaning effect.

[0041] According to an embodiment of the present disclosure, a plurality of spray arms 2 and a plurality of spray arm ports 532 may be provided. Each of the plurality of spray arm ports 532 is in communication with at least one of the plurality of spray arms 2. Therefore, a variety of connection combinations may be realized for the plurality of spray arm ports 532 and the plurality of spray arms 2 to meet different requirements of a connection structure, thereby achieving an alternate cleaning of the plurality of spray arms 2.

[0042] It should be noted here that, in the description

of the present disclosure, "a plurality of" means two or more, unless otherwise clearly and specifically limited. In addition, the spray arm 2 and the spray arm port 532 may be equal or unequal to each other in numbers. Consequently, a connection between the spray arm 2 and the spray arm port 532 may be combined as desired. Therefore, in different modes, the water for washing may enter, via the spray arm port 532, one or more spray arms 2 corresponding to the spray arm port 532 to be sprayed for cleaning. The washing modes are diversified and the dishwasher 100 is more convenient to be used.

[0043] Further, the washing pump port 533 selectively communicates with at least one of the plurality of spray arm ports 532, or the second heating device port 534 selectively communicates with at least one of the plurality of spray arm ports 532.

[0044] In an embodiment, during the non-heating period as described above, the washing pump port 533 selectively communicates with at least one of the plurality of spray arm ports 532, in which case the water for washing may flow into one or more of the plurality of spray arms 2 as desired in a non-heating mode, thereby activating an alternate cleaning mode. In addition, during the heating period as described above, the second heating device port 534 selectively communicates with at least one of the plurality of spray arm ports 532, in which case the water for washing may flow into one or more of the plurality of spray arms 2 as desired in a heating mode, thereby activating the alternate cleaning mode.

[0045] Further, as illustrated in FIG. 6 to FIG. 9, the water distribution valve assembly 6 also includes a toggle member 64 movably disposed in the flow distribution cavity 53 to open or close the spray arm port 532. When the toggle member 64 is moved to a position directly opposite to the spray arm port 532, the toggle member 64 is capable of blocking the spray arm port 532 to close the spray arm port 532. When the toggle member 64 is moved to a position offset from the spray arm port 532, the toggle member 64 is capable of opening the spray arm port 532. It should be understood that opening and closing of the spray arm port 532 may be controlled by controlling a movement of the toggle member 64 within the flow distribution cavity 53 to allow the washing pump port 533 to selectively communicate with at least one of the plurality of the spray arm ports 532, or to allow the second heating device port 534 to selectively communicate with the at least one of the plurality of spray arm ports 532.

[0046] The toggle member 64 may be disposed on the valve core 62 in such a manner that the toggle member 64 may rotate together with a rotation of the valve core 62 to open or close the spray arm port 532. In an embodiment, as illustrated in FIG. 6 to FIG. 9, the toggle member 64 is of a sector structure. One of the toggle member 64 and the valve core 62 has an engagement protrusion 643, and the other of the toggle member 64 and the valve core 62 has an engagement groove 624. The engagement protrusion 643 is engaged into the en-

gagement groove 624 to realize a connection between the toggle member 64 and the valve core 62 and further, to allow the toggle member 64 to move along with the valve core 62. That is, the toggle member 64 can be rotated together with the rotation of the valve core 62 to open or close the spray arm port 532. Of course, the present disclosure is not limited in this regard. The toggle member 64 may be also connected to the valve core 62 by a threaded fastener, or the toggle member 64 may be adhered to the valve core 62, or the toggle member 64 and the valve core 62 may be formed into one piece.

[0047] According to an embodiment of the present disclosure, as illustrated in FIG. 6 to FIG. 9, the spray arm port 532 includes a first spray arm port 5321 and a second spray arm port 5322. Two toggle members 64 are provided and include a first toggle member 641 and a second toggle member 642. The first toggle member 641 and the second toggle member 642 are spaced apart from each other on the valve core 62, and driven by the valve core 62 to move within the flow distribution cavity 53. When the washing pump port 533 selectively communicates with at least one of the plurality of spray arm ports 532, the first toggle member 641 is capable of opening or closing the first spray arm port 5321, and the second toggle member 642 is capable of opening or closing the second spray arm port 5322. When the second heating device port 534 selectively communicates with at least one of the plurality of spray arm ports 532, the second toggle member 642 is capable of opening or closing the first spray arm port 5321, and the first toggle member 641 is capable of opening or closing the second spray arm port 5322.

[0048] In an embodiment of the present disclosure, as illustrated in FIG. 1, the spray arm 2 includes a lower spray arm 23, an upper spray arm 21, and a middle spray arm 22. The lower spray arm 23 is disposed at a lower part of an inside of the inner washing tub 1. The upper spray arm 21 is disposed at an upper part of the inside of the inner washing tub 1. The middle spray arm 22 is disposed in a middle part of the inner washing tub 1. Therefore, by arranging the spray arm 2 on each of the upper part, the middle part, and the lower part of the inner washing tub 1, it is possible to establish communication at the upper part, the middle part, or the lower part of the inner washing tub 1.

[0049] Further, the spray arm port 532 includes the first spray arm port 5321 in communication with the lower spray arm 23 and the second spray arm port 5322 in communication with both the upper spray arm 21 and the middle spray arm 22. In this manner, during cleaning, water may be introduced to the lower spray arm 23 separately and sprayed, and the water may be introduced to the upper spray arm 21 and middle spray arm 22 simultaneously and sprayed, or the water may be introduced to the upper spray arm 21, the middle spray arm 22, and the lower spray arm 23 simultaneously and sprayed, to achieve the alternate spraying.

[0050] It should be understood that in the present dis-

closure, only one spray arm port 532, two spray arm ports 532 (e.g., the first spray arm port 5321 and the second spray arm port 5322 described above), or more than two spray arm ports 532 may be provided. In an embodiment, three, four, five, or more spray arm ports 532 may be provided. It should be understood that, when three spray arm ports 532 are provided, three toggle members may also be provided; when four spray arm ports 532 are provided, four toggle members may also be provided; and when five spray arm ports 532 are provided, five toggle members may also be provided.

[0051] In the present disclosure, only one spray arm 2, two spray arms 2, three spray arms 2 (e.g., the lower spray arm 23, the upper spray arm 21, and the middle spray arm 22 described above), or more than three spray arms 2 may be provided. In an embodiment, four, five, six, or more than six spray arms 2 may be provided. Positions of the spray arms 2 in the inner washing tub 1 may be determined as desired.

[0052] An alternate cleaning process of the dishwasher 100 between the heating mode and the non-heating mode in the present disclosure will be described below in connection with two embodiments.

[0053] According to an embodiment of the present disclosure, with reference to FIG. 1 to FIG. 9, three spray arms 2 are provided and include the lower spray arm 23, the upper spray arm 21, and the middle spray arm 22. The lower spray arm 23 is disposed at the lower part of the inside of the inner washing tub 1. The upper spray arm 21 is disposed at the upper part of the inside of the inner washing tub 1. The middle spray arm 22 is disposed in the middle part of the inner washing tub 1. Two spray arm ports 532 are provided, and include the first spray arm port 5321 in communication with the lower spray arm 23 and the second spray arm port 5322 in communication with both the upper spray arm 21 and the middle spray arm 22. Two toggle members 64 are provided, and include the first toggle member 641 and the second toggle member 642. The first toggle member 641 and the second toggle member 642 are spaced apart from each other on the valve core 62, and driven by the valve core 62 to move within the flow distribution cavity 53. When the washing pump port 533 selectively communicates with at least one of the two spray arm ports 532, the first toggle member 641 is capable of opening or closing the first spray arm port 5321, and the second toggle member 642 is capable of opening or closing the second spray arm port 5322. When the second heating device port 534 selectively communicates with at least one of the two spray arm ports 532, the second toggle member 642 is capable of opening or closing the first spray arm port 5321, and the first toggle member 641 is capable of opening or closing the second spray arm port 5322. In this embodiment, six cleaning modes, which includes a first mode, a second mode, a third mode, a fourth mode, and a fifth mode, may be implemented by controlling the rotation angle of the valve core 62 in the flow distribution cavity 53.

[0054] In the first mode, the spray arm port 532 is in

communication with the washing pump port 533, and the first heating device port 611 is blocked by valve core 62. In addition, the first spray arm port 5321 is opened by the first toggle member 641, and the second spray arm port 5322 is opened by the second toggle member 642. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing, instead of entering the heating device 3 via the first heating device port 611, partially directly flows into the lower spray arm 23 via the first spray arm port 532 and into the upper spray arm 21 and the middle spray arm 22 via the second spray arm port 5322. Therefore, a simultaneous spray cleaning mode is implemented by the lower spray arm 23, the upper spray arm 21, and the middle spray arm 22 of the dishwasher in the non-heating mode.

[0055] In the second mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is opened by the first toggle member 641, and the second spray arm port 5322 is closed by the second toggle member 642. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing directly flows into, via the first spray arm port 532, the lower spray arm 23, rather than flowing into, via the first heating device port 611, the heating device 3. Therefore, a spray cleaning mode is implemented by the lower spray arm 23 of the dishwasher in the non-heating mode.

[0056] In the third mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is closed by the first toggle member 641, and the second spray arm port 5322 is opened by the second toggle member 642. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing directly flows into, via the second spray arm port 5322, the upper spray arm 21 and the middle spray arm 22, rather than flowing into, via the first heating device port 611, the heating device 3. Therefore, a simultaneous spray cleaning mode is implemented by the upper spray arm 21 and the middle spray arm 22 of the dishwasher in the non-heating mode.

[0057] In the fourth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is opened by the second toggle member 642, and the second spray arm port 5322 is opened by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then partially

flows into the lower spray arm 23 via the first spray arm port 532 and into the upper spray arm 21 and the middle spray arm 22 via the second spray arm port 5322. Therefore, a simultaneous spray cleaning mode is implemented by the lower spray arm 23, the upper spray arm 21, and the middle spray arm 22 of the dishwasher in the heating mode.

[0058] In the fifth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is opened by the second toggle member 642, and the second spray arm port 5322 is closed by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then flows into the lower spray arm 23 via the first spray arm port 532. Therefore, a spray cleaning mode is implemented by the lower spray arm 23 of the dishwasher in the heating mode.

[0059] In the sixth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is closed by the second toggle member 642, and the second spray arm port 5322 is opened by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then flows into the upper spray arm 21 and the middle spray arm 22 via the second spray arm port 5322. Therefore, a simultaneous spray cleaning mode is implemented by the upper spray arm 21 and the middle spray arm 22 of the dishwasher in the heating mode.

[0060] According to another embodiment (not illustrated) of the present disclosure, three spray arms 2 are provided and include the lower spray arm 23, the upper spray arm 21, and the middle spray arm 22. The lower spray arm 23 is disposed at the lower part of the inside of the inner washing tub 1. The upper spray arm 21 is disposed at the upper part of the inside of the inner washing tub 1. The middle spray arm 22 is disposed in the middle part of the inner washing tub 1. Three spray arm ports 532 are provided and include the first spray arm port 5321 in communication with the upper spray arm 21, the second spray arm port 5322 in communication with the middle spray arm 22, and a third spray arm port in communication with the lower spray arm 23. Three toggle members 64 are provided and include the first toggle member 641, the second toggle member 642, and a third

toggle member. The first toggle member 641, the second toggle member 642, and the third toggle member are spaced apart from each other on the valve core 62, and driven by the valve core 62 to move within the flow distribution cavity 53. When the washing pump port 533 selectively communicates with at least one of the three spray arm ports 532, the first toggle member 641 is capable of opening or closing the first spray arm port 5321, the second toggle member 642 is capable of opening or closing the second spray arm port 5322, and the third toggle member is capable of opening or closing the third spray arm port. When the second heating device port 534 selectively communicates with at least one of the three spray arm ports 532, the third toggle member is capable of opening or closing the first spray arm port 5321, the second toggle member 642 is capable of opening or closing the second spray arm port 5322, and the first toggle member 641 is capable of opening or closing the third spray arm port. In this embodiment, fourteen cleaning modes, which includes a first mode, a second mode, a third mode, a fourth mode, a fifth mode, a sixth mode, a seventh mode, an eighth mode, a ninth mode, a tenth mode, an eleventh mode, a twelfth mode, a thirteenth mode, a fourteenth mode, may be implemented by controlling the angle of rotation of the valve core 62 in the flow distribution cavity 53.

[0061] In the first mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is opened by the first toggle member 641, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is opened by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing, instead of entering the heating device 3 via the first heating device port 611, partially directly flows into the upper spray arm 21 via the first spray arm port 532, into the middle spray arm 22 via the second spray arm port 5322, and directly into the lower spray arm 23 via the third spray arm port. Therefore, a simultaneous spray cleaning mode is implemented by the lower spray arm 23, the upper spray arm 21, and the middle spray arm 22 of the dishwasher in the non-heating mode.

[0062] In the second mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is opened by the first toggle member 641, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is closed by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing, instead of entering the heating device 3 via the first heating device port 611, partially directly flows into the upper spray arm 21 via the first spray arm port 532 and flows into the middle spray

arm 22 via the second spray arm port 5322. Therefore, a simultaneous spray cleaning mode is implemented by the upper spray arm 21 and the middle spray arm 22 of the dishwasher in the non-heating mode.

[0063] In the third mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is opened by the first toggle member 641, and the second spray arm port 5322 is closed by the second toggle member 642. Further, the third spray arm port is opened by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing, instead of entering the heating device 3 via the first heating device port 611, partially directly flows into the upper spray arm 21 via the first spray arm port 532 and into the lower spray arm 23 via the third spray arm port. Therefore, a simultaneous spray cleaning mode is implemented by the lower spray arm 23 and the upper spray arm 21 of the dishwasher in the non-heating mode.

[0064] In the fourth mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is closed by the first toggle member 641, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is opened by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing, instead of entering the heating device 3 via the first heating device port 611, partially directly flows into the middle spray arm 22 via the second spray arm port 5322 and into the lower spray arm 23 via the third spray arm port. Therefore, a simultaneous spray cleaning mode is implemented by the lower spray arm 23 and the middle spray arm 22 of the dishwasher in the non-heating mode.

[0065] In the fifth mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is opened by the first toggle member 641, and the second spray arm port 5322 is closed by the second toggle member 642. Further, the third spray arm port is closed by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing directly flows into, via the first spray arm port 532, the upper spray arm 21, rather than flowing into, via the first heating device port 611, the heating device 3. Therefore, a spray cleaning mode is implemented by the upper spray arm 21 of the dishwasher in the non-heating mode.

[0066] In the sixth mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is closed by the first toggle member 641, and the second spray arm

port 5322 is closed by the second toggle member 642. Further, the third spray arm port is opened by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing directly flows into, via the third spray arm port, the lower spray arm 23, rather than flowing into, via the first heating device port 611, the heating device 3. Therefore, a spray cleaning mode is implemented by the lower spray arm 23 of the dishwasher in the non-heating mode.

[0067] In the seventh mode, the spray arm port 532 is in communication with the washing pump port 533, and the first heating device port 611 is blocked by the valve core 62. In addition, the first spray arm port 5321 is closed by the first toggle member 641, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is closed by the third toggle member. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing directly flows into, via the second spray arm port 5322, the middle spray arm 22, rather than flowing into, via the first heating device port 611, the heating device 3. Therefore, a spray cleaning mode is implemented by the middle spray arm 22 of the dishwasher in the non-heating mode.

[0068] In the eight mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is opened by the third toggle member, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is opened by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then the heated water partially flows into the upper spray arm 21 via the first spray arm port 532, into the middle spray arm 22 via the second spray arm port 5322, and into the lower spray arm 23 via the third spray arm port. Therefore, a simultaneous spray cleaning mode is implemented by the upper spray arm 21, the middle spray arm 22, and the lower spray arm 23 of the dishwasher in the heating mode.

[0069] In the ninth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is opened by the third toggle member, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is closed by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port

533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then partially flows into the upper spray arm 21 via the first spray arm port 532 and into the middle spray arm 22 via the second spray arm port 5322. Therefore, a simultaneous spray cleaning mode is implemented by the upper spray arm 21 and the middle spray arm 22 of the dishwasher in the heating mode.

[0070] In the tenth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is opened by the third toggle member, and the second spray arm port 5322 is closed by the second toggle member 642. Further, the third spray arm port is opened by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then partially flows into the upper spray arm 21 via the first spray arm port 532 and into the lower spray arm 23 via the third spray arm port. Therefore, a simultaneous spray cleaning mode is implemented by the upper spray arm 21 and the lower spray arm 23 of the dishwasher in the heating mode.

[0071] In the eleventh mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is closed by the third toggle member, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is opened by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then partially flows into the middle spray arm 22 via the second spray arm port 5322 and into the lower spray arm 23 via the third spray arm port. Therefore, a simultaneous spray cleaning mode is implemented by the middle spray arm 22 and the lower spray arm 23 of the dishwasher in the heating mode.

[0072] In the twelfth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is opened by the third toggle member, and the second spray arm port 5322 is closed by the second toggle member 642. Further, the third spray arm port is closed by the first

toggle member 641e. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then all the heated water flows into the upper spray arm 21 via the first spray arm port 532. Therefore, a spray cleaning mode is implemented by the upper spray arm 21 of the dishwasher in the heating mode.

[0073] In the thirteenth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is closed by the third toggle member, and the second spray arm port 5322 is opened by the second toggle member 642. Further, the third spray arm port is closed by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 to be heated. The heated water flows to the second heating device port 534, and then the heated water all flows into the middle spray arm 22 via the second spray arm port 5322. Therefore, a spray cleaning mode is implemented by the middle spray arm 22 of the dishwasher in the heating mode.

[0074] In the fourteenth mode, the spray arm port 532 is in communication with the second heating device port 534, and the first heating device port 611 is opened by the valve core 62 to allow the washing pump port 533 to be in communication with the first heating device port 611. In addition, the first spray arm port 5321 is closed by the third toggle member, and the second spray arm port 5322 is closed by the second toggle member 642. Further, the third spray arm port is opened by the first toggle member 641. In this case, after the washing pump 4 pumps the water for washing to the washing pump port 533, the water for washing enters, via the first heating device port 611, the heating device 3 for heating. The heated water flows to the second heating device port 534, and then the heated water all flows into the lower spray arm 23 via the third spray arm port. Therefore, a spray cleaning mode 23 is implemented by the lower spray arm of the dishwasher in the heating mode.

[0075] According to some embodiments of the present disclosure, the heating device 3 includes a compressor 31, a condenser 32, a throttling device 33, and an evaporator 34 that are connected end to end sequentially to form a refrigerant cycle. That is, according to some embodiments of the present disclosure, the dishwasher 100 is a heat pump-heated dishwasher 100. A refrigerant undergoes a process of compression, condensation and heat release, throttling and expansion, and evaporation and heat absorption in a heat pump system to convert low-grade energy into high-grade heat. After the low-grade energy is converted into the high-grade heat, the high-grade heat is released in the water for washing to

achieve the heating with high efficiency and low energy consumption. Compared with conventional electric heating, a performance coefficient of a heat pump-heated system is 3 to 4 times higher than or more than 4 times that of general electric heating technologies. The dishwasher 100 using the heat pump-heated technology has a significant energy saving effect, and can greatly reduce energy consumption of the dishwasher 100. Thus, it is an effective way to reduce the energy consumption of the dishwasher 100.

[0076] Further, the condenser 32 has a first liquid flow channel and a second liquid flow channel defined thereon. The to-be-heated water inlet 321 and the heated water outlet 322 are defined at two ends of the first liquid flow channel, respectively. The compressor 31 and the throttling device 33 are in communication with both ends of the second liquid flow channel, respectively. That is, the condenser 32 is a liquid-liquid heat exchanger, which is capable of improving heating efficiency of condensed water.

[0077] In addition, in order to improve heat exchange efficiency of the water for washing and the refrigerant, each of the first liquid flow channel and the second liquid flow channel may be designed with a complex structure, which may increase a flow resistance in the first liquid flow channel. Under such a context, directly connecting the condenser 32 to an original flow path of a washing system may cause problems such as a decrease in spray pressure of the spray arm 2 of the dishwasher 100 or an increase in power consumption of the washing pump 4 of the dishwasher 100, especially during the non-heating period. To this end, by providing the water distribution valve assembly 6, the dishwasher 100 according to the embodiments of the present disclosure can solve a problem of a high flow resistance caused by the water for washing flowing through the condenser 32 during the non-heating period. In addition, the water distribution valve assembly 6 and the water collection tank 5 of the dishwasher 100 are assembled to form the entire assembled structure 5-6, which not only requires no connection pipes between the water distribution valve assembly 6 and the water collection tank 5, but also provides a compact overall structure for the dishwasher 100.

[0078] Of course, the present disclosure is not limited in this regard. The heating device 3 according to the embodiments of the present disclosure may also adopt the electric heating. In an embodiment, electric heating wire heating technologies or thick film heating technologies may be adopted to heat the water for washing. Heating the water for washing with the electric heating is simple in structure and easy to be controlled.

[0079] In the description of the present disclosure, it should be understood that the orientation or position relationship indicated by the terms "upper", "lower", "vertical", "horizontal", "top", "bottom", "inner", and "outer", etc., is based on the orientation or position relationship shown in the drawings, and is only for the convenience of describing the present disclosure and simplifying the

description, rather than indicating or implying that the pointed device or element must have a specific orientation, or be constructed and operated in a specific orientation, and therefore cannot be understood as a limitation on the present disclosure.

[0080] In the description of the present disclosure, it should be noted that, unless otherwise clearly specified and limited, terms such as "installed", "mounted", "connected", "coupled" and the like should be understood in a broad sense. For example, it may be a fixed connection or a detachable connection or connection as one piece; it may be a mechanical connection or an electrical connection; it may be a direct connection or an indirect connection through an intermediate; it may be an internal communication of two components or the interaction relationship between two components. For those of ordinary skill in the art, the specific meaning of the above-mentioned terms in the present disclosure can be understood according to specific circumstances.

[0081] In the description of the present disclosure, unless expressly stipulated and defined otherwise, the first feature "on" or "under" the second feature may mean that the first feature is in direct contact with the second feature, or the first and second features are in indirect contact through a feature between the first and second features. Moreover, the first feature "above" the second feature may mean that the first feature is directly above or obliquely above the second feature, or simply mean that the level of the first feature is higher than that of the second feature. The first feature "below" the second feature may mean that the first feature is directly below or obliquely below the second feature, or simply mean that the level of the first feature is smaller than that of the second feature.

[0082] In the description of this specification, descriptions with reference to the terms "an embodiment", "some embodiments", "illustrative embodiments", "examples", "specific examples", or "some examples" etc., mean that specific features, structure, materials or characteristics described in conjunction with the embodiment or example are included in at least one embodiment or example of the present disclosure. In this specification, the schematic representations of the above terms do not necessarily refer to the same embodiment or example. Moreover, the described specific features, structures, materials or characteristics may be combined in any one or more embodiments or examples in a suitable manner.

[0083] Although embodiments of the present disclosure have been illustrated and described, it is conceivable for those of ordinary skill in the art that various changes, modifications, replacements, and variations can be made to these embodiments without departing from the principles and spirit of the present disclosure. The scope of the present disclosure shall be defined by the claims as appended and their equivalents.

Claims

1. A dishwasher, comprising:

5 an inner washing tub having a washing cavity defined therein;
a spray arm disposed in the inner washing tub;
a heating device configured to heat water for washing and having a to-be-heated water inlet and a heated water outlet;
10 a washing pump having a washing pump inlet and a washing pump outlet;
a water collection tank disposed at a bottom of the inner washing tub, wherein the water collection tank has:

a water collection cavity in communication with the washing cavity and having a washing outlet connected to the washing pump inlet;
a flow distribution cavity having an opening; and
a spray arm port, a washing pump port, and a second heating device port that are in communication with the flow distribution cavity, wherein the spray arm port is connected to the spray arm, wherein the washing pump port is connected to the washing pump outlet, and wherein the second heating device port is connected to the heated water outlet; and

a water distribution valve assembly comprising:

35 a valve seat having a first heating device port, wherein the valve seat is connected to the water collection tank and configured to block the opening of the flow distribution cavity, and wherein the first heating device port is in communication with the flow distribution cavity and connected to the to-be-heated water inlet; and
40 a valve core movably disposed in the flow distribution cavity to allow the spray arm port to switch from communicating with the washing pump port to the second heating device port, wherein the valve core is configured to: block the first heating device port when the spray arm port is in communication with the washing pump port, and open the first heating device port when the spray arm port is in communication with the second heating device port to allow the washing pump port to be in communication with the first heating device port.

2. The dishwasher according to claim 1, wherein the valve core comprises a separating plate obliquely

disposed in the flow distribution cavity to separate the washing pump port and the second heating device port, the washing pump port and the second heating device port being positioned at opposite sides of the separating plate respectively, wherein the separating plate has a first surface and a second surface opposite to the first surface, and wherein the first surface is normally opposite to the spray arm port, and is switchably opposite to the washing pump port and to the second heating device port to allow the spray arm port to switch from communicating with the washing pump port to the second heating device port.

3. The dishwasher according to claim 2, wherein:

the valve core further comprises a capping plate disposed at an end of the separating plate; and the capping plate is configured to: cap the first heating device port when the first surface is opposite to the washing pump port, and deviate from the first heating device port when the first surface is opposite to the second heating device port.

4. The dishwasher according to claim 1, wherein:

the valve core is rotatably disposed in the flow distribution cavity; and the water distribution valve assembly further comprises a driving mechanism configured to drive the valve core to rotate, the driving mechanism comprising:

a driving motor;
a motor mounting plate disposed on the valve seat, wherein the driving motor is disposed at a side of the motor mounting plate facing away from the valve seat; and
a transmission member disposed at a side of the motor mounting plate adjacent to the valve seat, wherein a motor shaft of the driving motor passes through the motor mounting plate to be connected to one end of the transmission member, and wherein another end of the transmission member passes through the valve seat to be connected to the valve core.

5. The dishwasher according to claim 4, wherein the valve core has a sleeve provided thereon, and wherein the other end of the transmission member is engaged within the sleeve.

6. The dishwasher according to claim 1, wherein:

a plurality of spray arms and a plurality of spray arm ports are provided, each of the plurality of

spray arm ports being in communication with at least one of the plurality of spray arms; and the washing pump port selectively communicates with at least one of the plurality of spray arm ports, or the second heating device port selectively communicates with at least one of the plurality of spray arm ports.

7. The dishwasher according to claim 6, wherein the water distribution valve assembly further comprises a toggle member movably disposed in the flow distribution cavity to open or close the spray arm port.

8. The dishwasher according to claim 7, wherein:

the toggle member is of a sector structure; one of the toggle member and the valve core has an engagement protrusion, and the other of the toggle member and the valve core has an engagement groove; and the engagement protrusion is engaged into the engagement groove to allow the toggle member to move along with the valve core.

9. The dishwasher according to claim 7, wherein:

the plurality of spray arm ports comprise a first spray arm port and a second spray arm port; two toggle members are provided and comprise a first toggle member and a second toggle member; when the washing pump port selectively communicates with at least one of the plurality of spray arm ports, the first toggle member is capable of opening or closing the first spray arm port, and the second toggle member is capable of opening or closing the second spray arm port; and when the second heating device port selectively communicates with at least one of the plurality of spray arm ports, the second toggle member is capable of opening or closing the first spray arm port, and the first toggle member is capable of opening or closing the second spray arm port.

10. The dishwasher according to claim 1, wherein:

the spray arm comprises:

a lower spray arm disposed at a lower part of an inside of the inner washing tub;
an upper spray arm disposed at an upper part of the inside of the inner washing tub; and
a middle spray arm disposed in a middle part of the inner washing tub, and

wherein the spray arm port comprises a first

spray arm port in communication with the lower spray arm, and a second spray arm port in communication with the upper spray arm and the middle spray arm.

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11. The dishwasher according to claim 1, wherein the heating device comprises a compressor, a condenser, a throttling device, and an evaporator that are connected end to end sequentially to form a refrigerant cycle.

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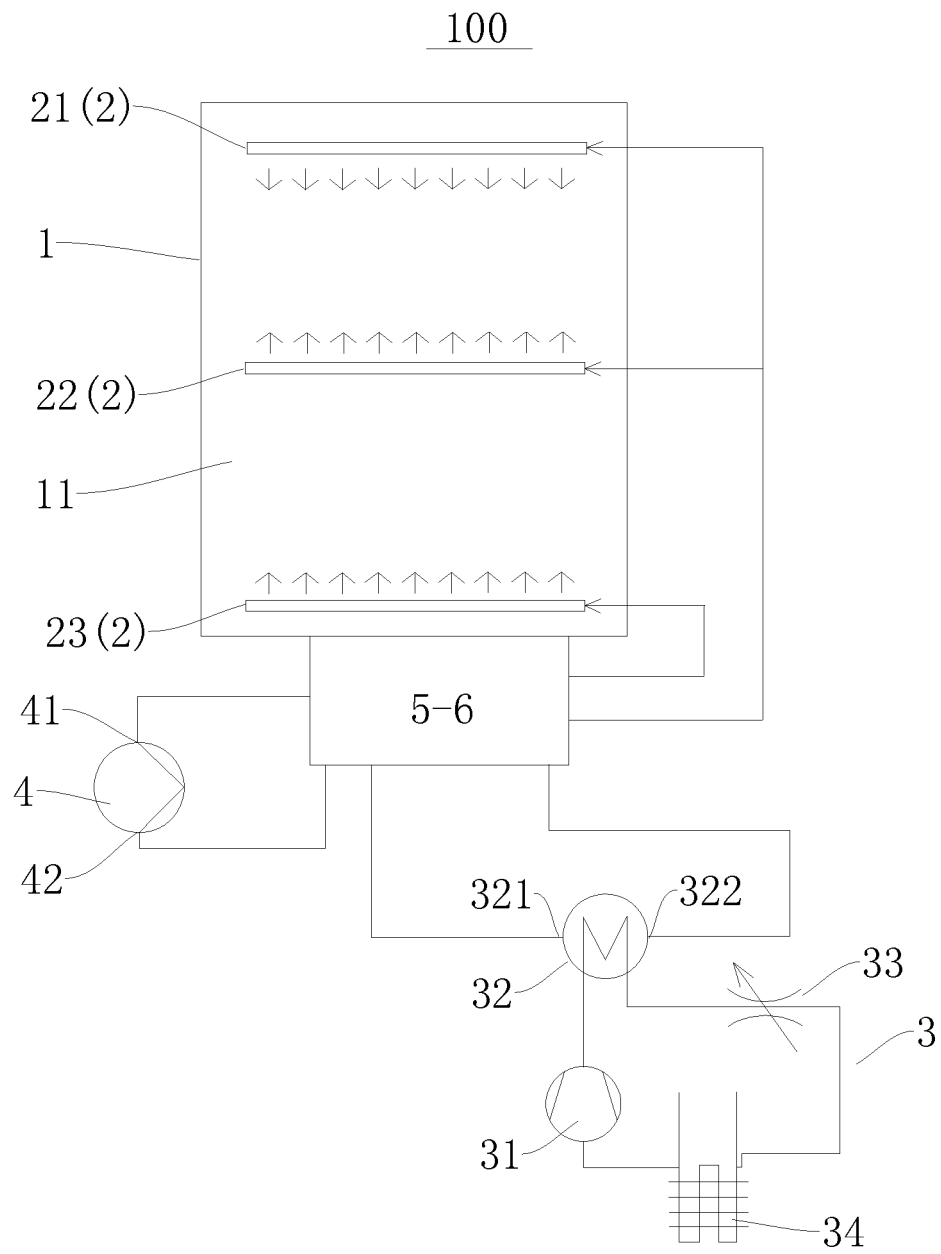


FIG. 1

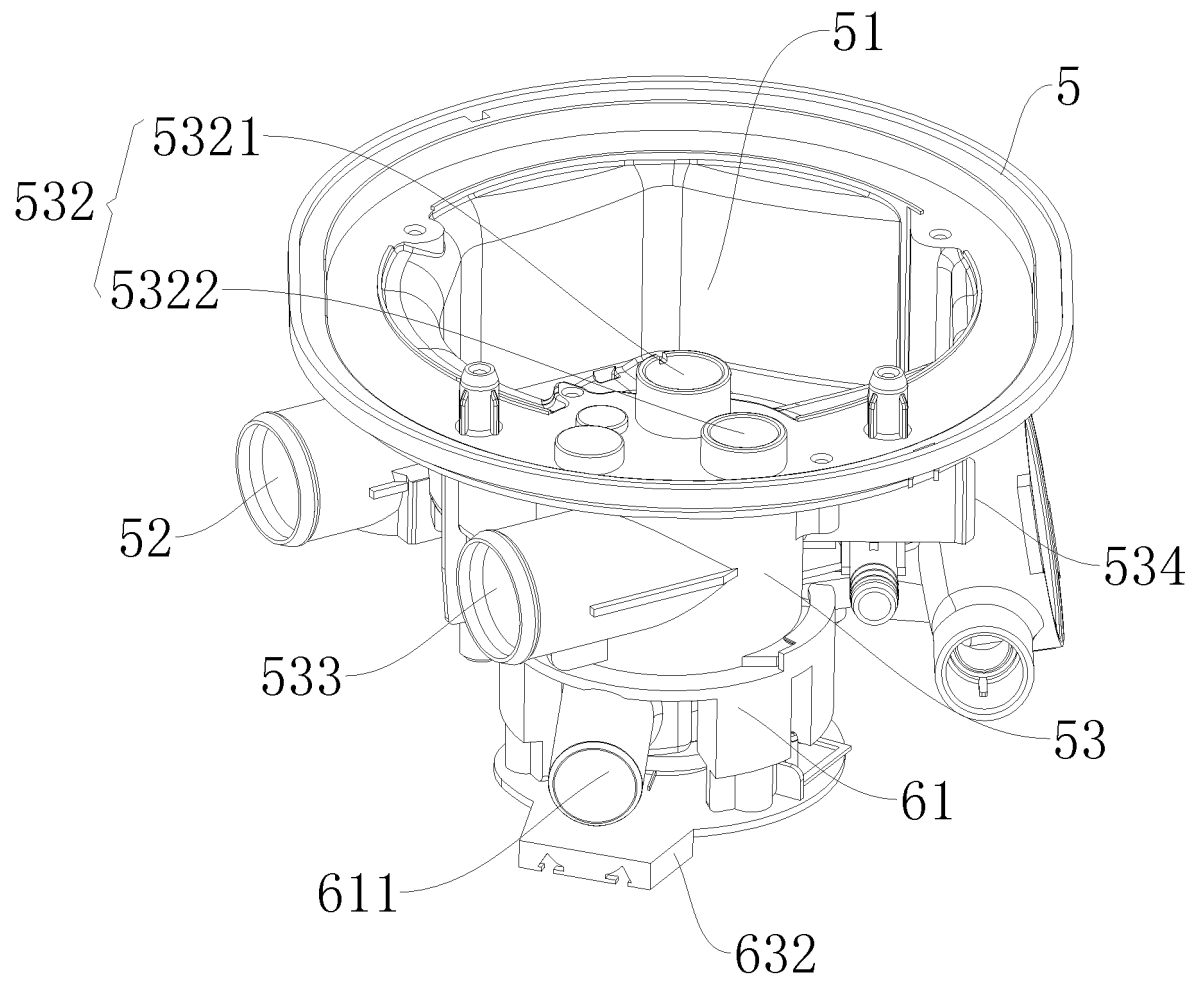


FIG. 2

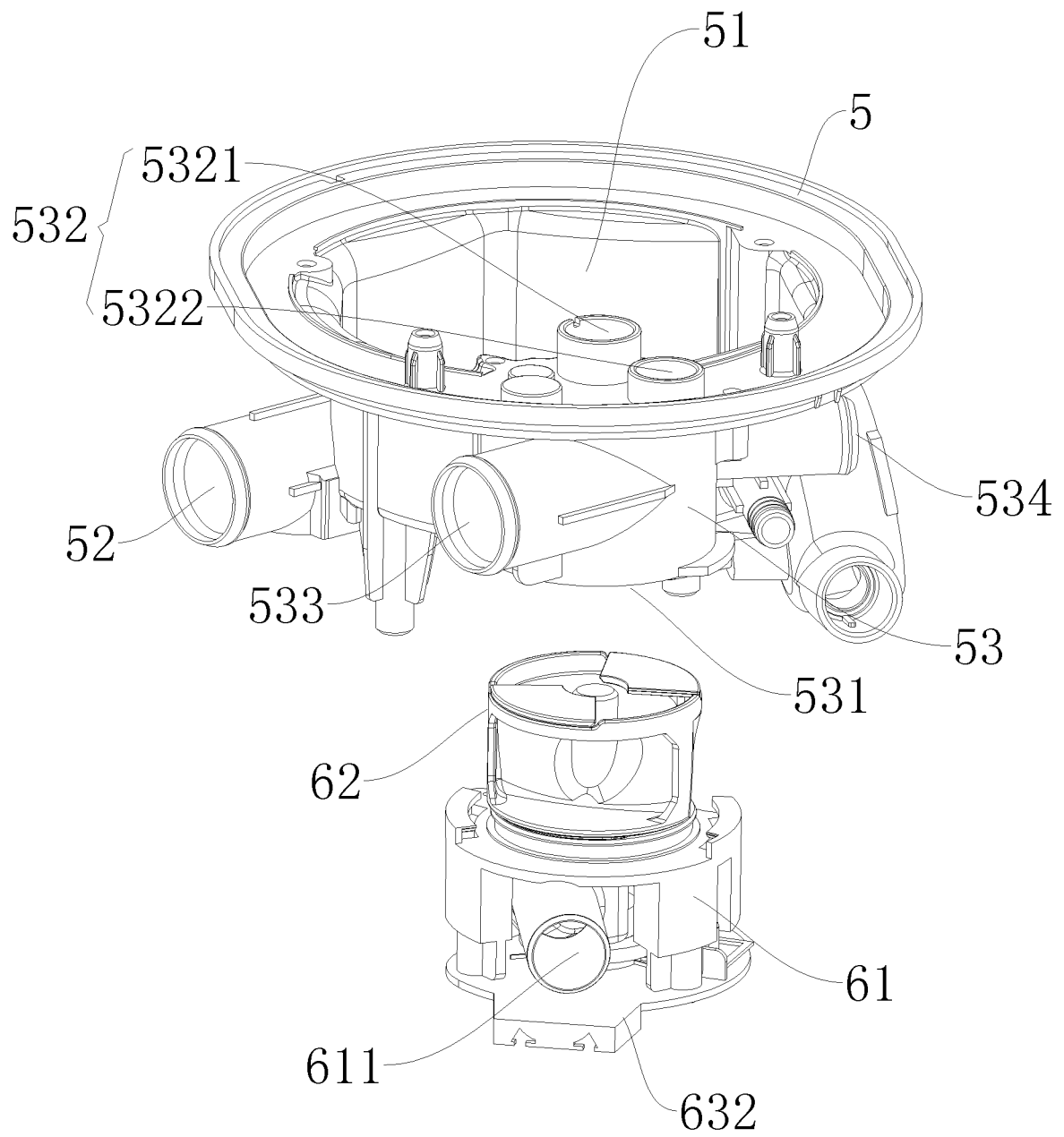


FIG. 3

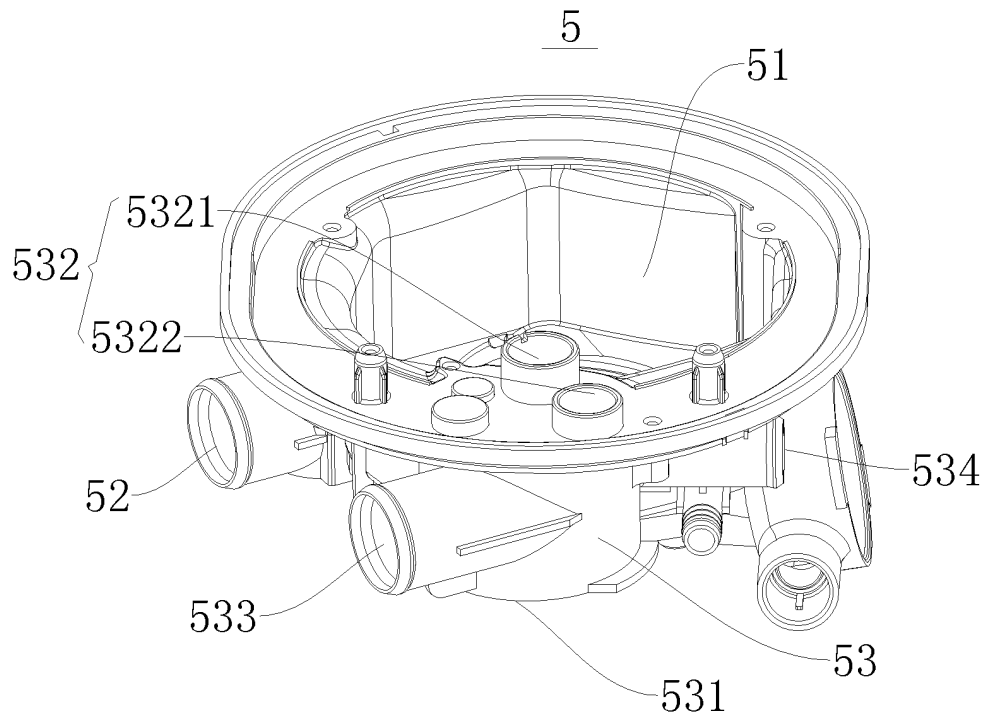


FIG. 4

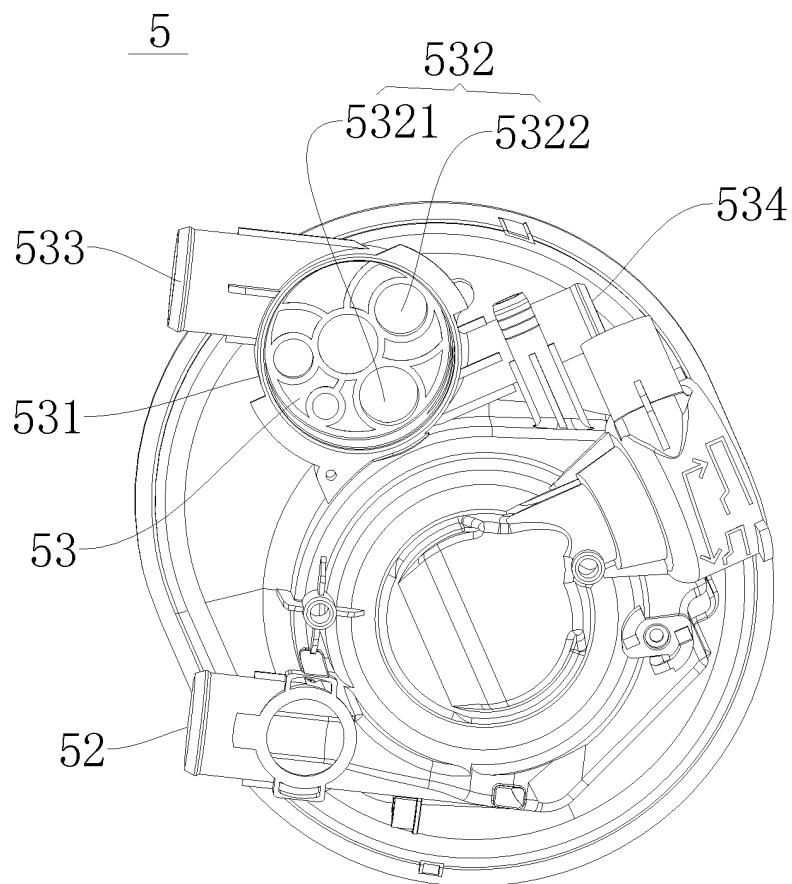


FIG. 5

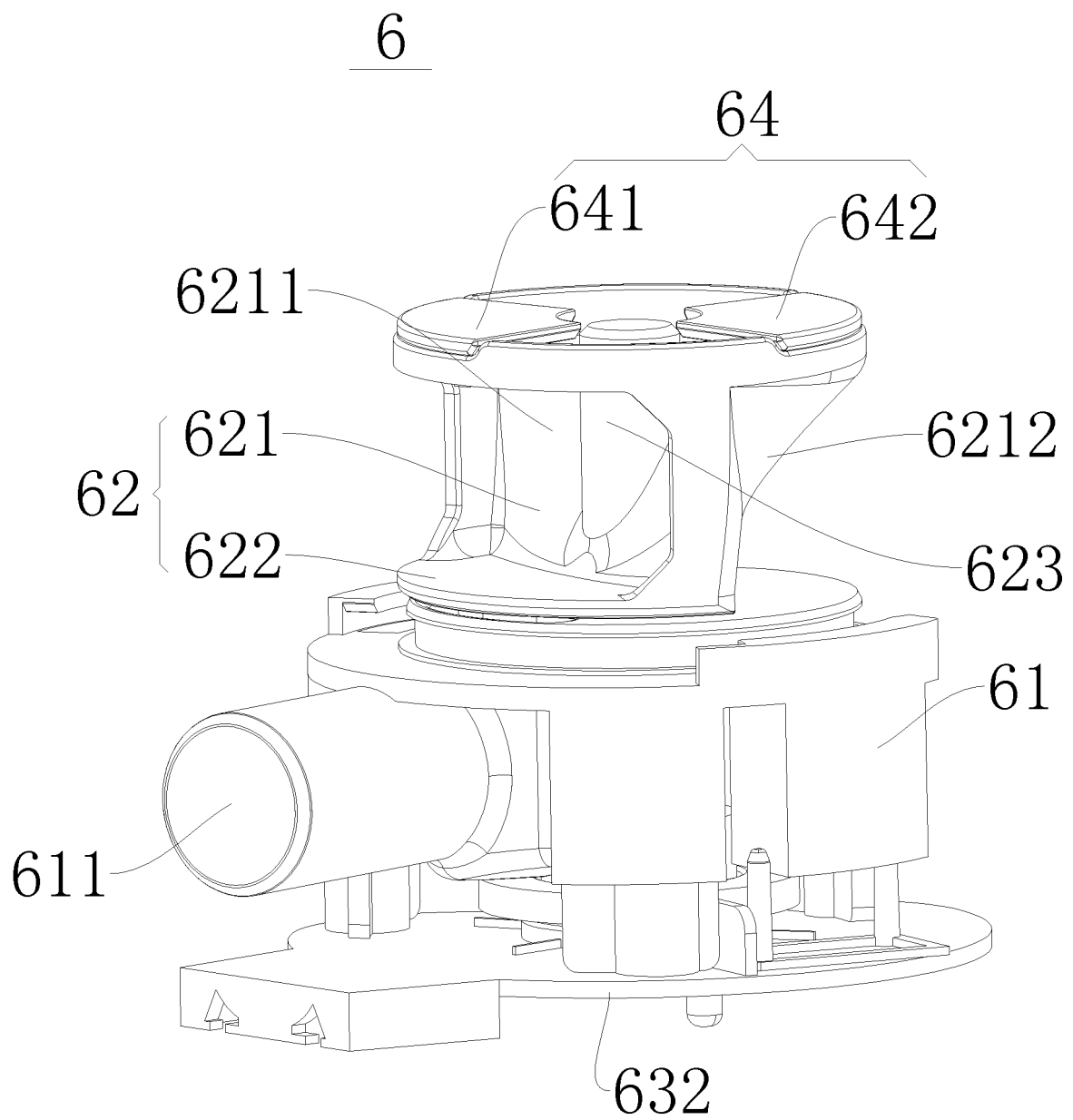


FIG. 6

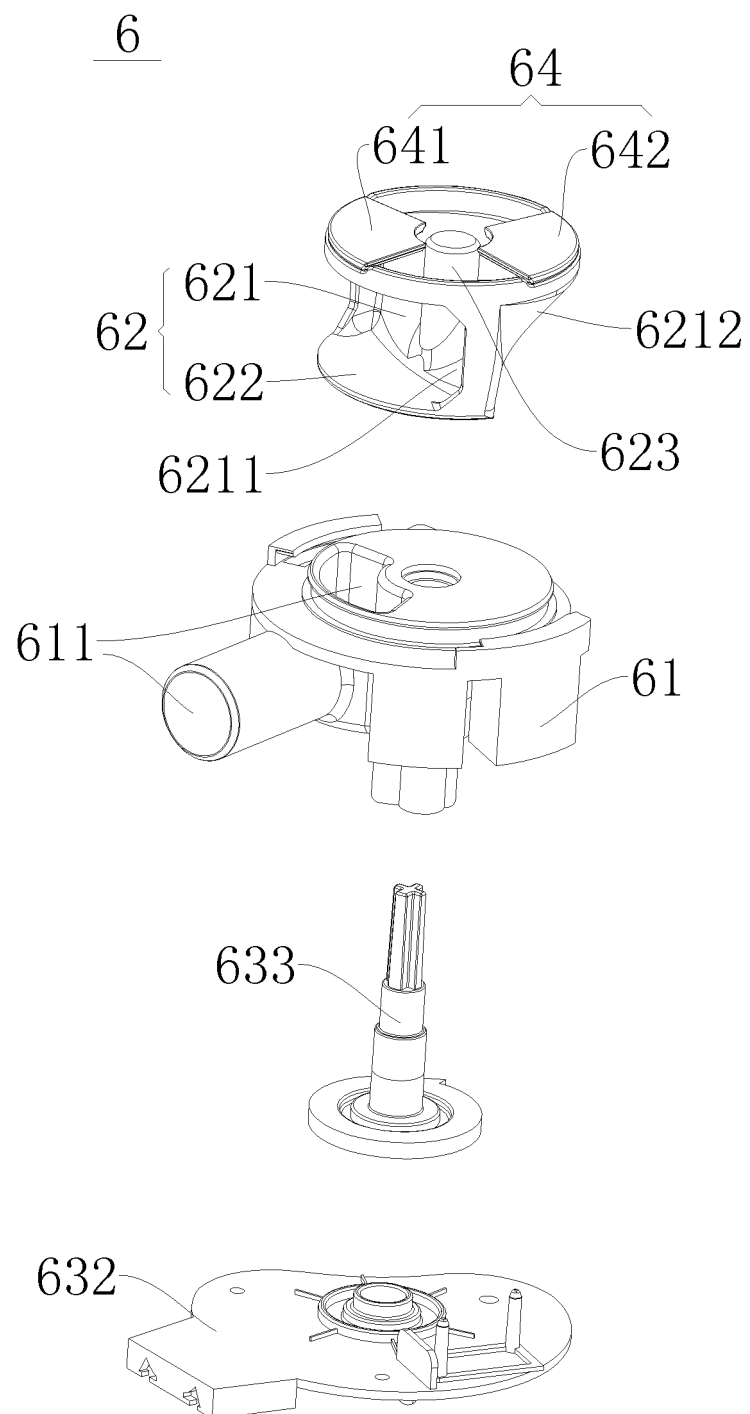


FIG. 7

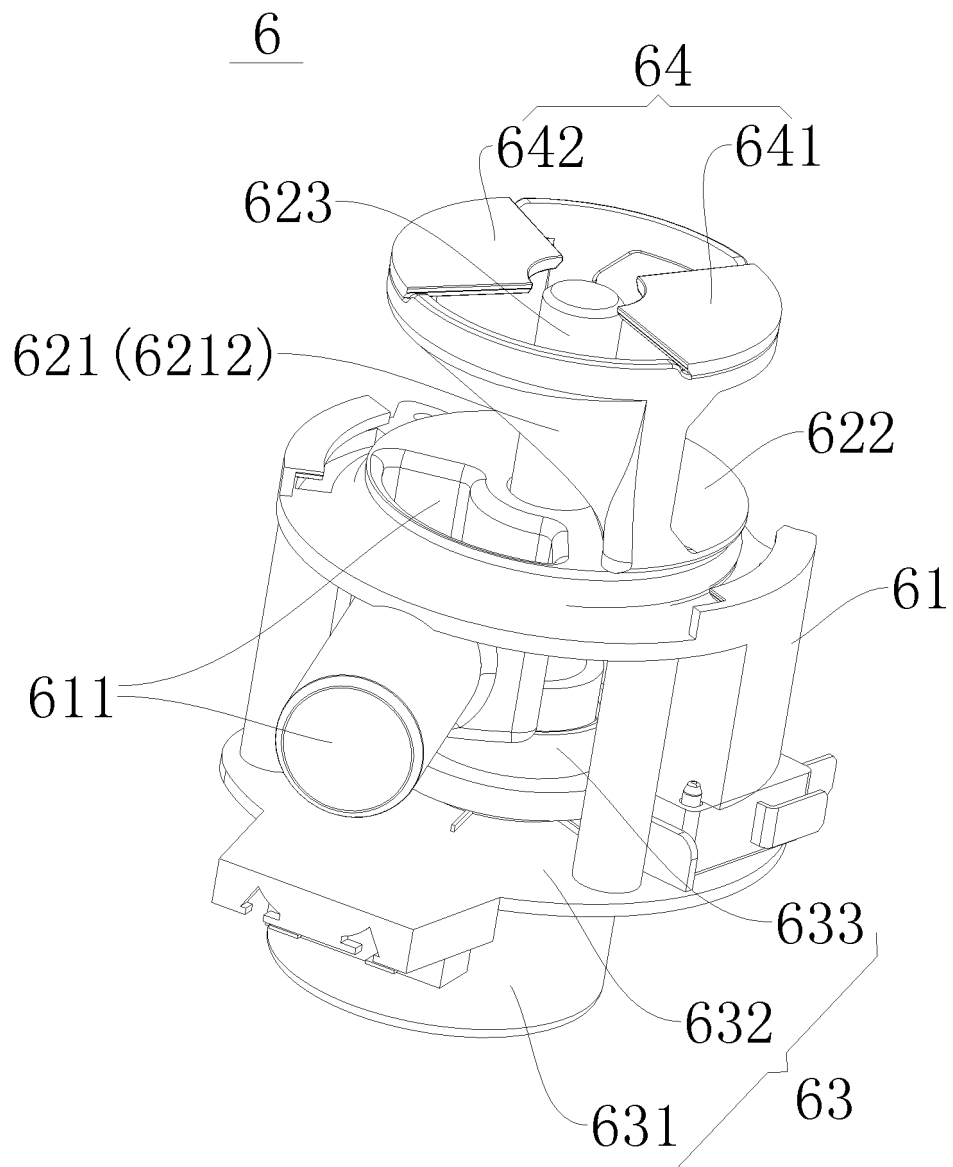


FIG. 8

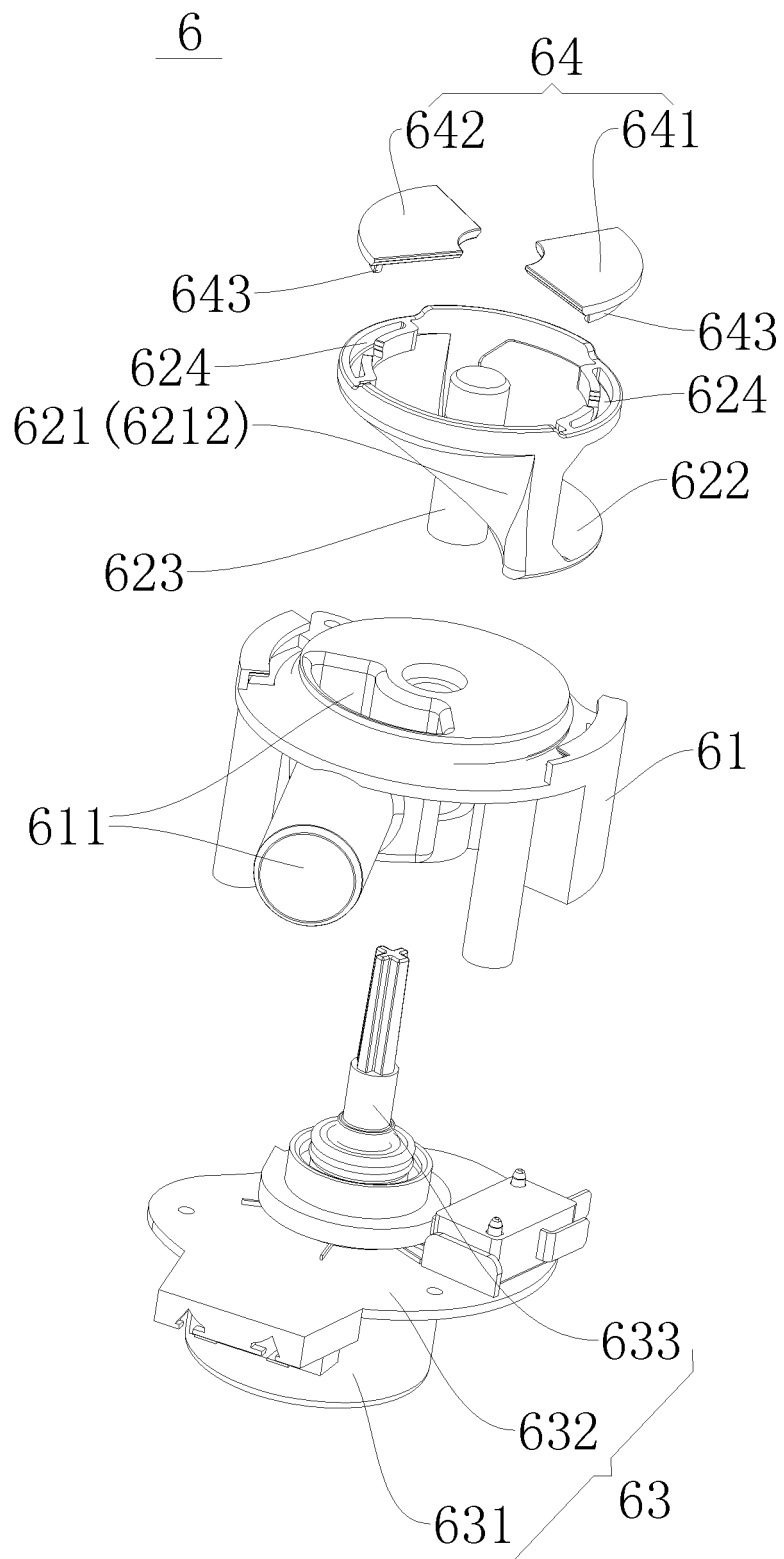


FIG. 9

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2020/133113

A. CLASSIFICATION OF SUBJECT MATTER A47L 15/16(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) A47L	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) CNPAT, WPI, EPODOC, CNKI: 佛山市顺德区美的洗涤电器制造有限公司, 美的集团股份有限公司, 刘闪闪, 蔡思琦, 洗碗机, 内胆, 腔, 喷淋臂, 加热, 泵, 分流, 分水阀, 阀芯, 切换, 接口, dish-washing machine, dishwasher, container, spray, arm, heat+, pump, tank, divid+, cavity, connector, valve, seat, pipe,	C. DOCUMENTS CONSIDERED TO BE RELEVANT																		
<table border="1"> <thead> <tr> <th>Category*</th> <th>Citation of document, with indication, where appropriate, of the relevant passages</th> <th>Relevant to claim No.</th> </tr> </thead> <tbody> <tr> <td>A</td> <td>CN 209315790 U (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 30 August 2019 (2019-08-30) description, paragraphs [0054]-[0112], and figures 1-22</td> <td>1-11</td> </tr> <tr> <td>PX</td> <td>CN 110881926 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 17 March 2020 (2020-03-17) claims 1-11</td> <td>1-11</td> </tr> <tr> <td>PX</td> <td>CN 211381188 U (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 01 September 2020 (2020-09-01) claims 1-11</td> <td>1-11</td> </tr> <tr> <td>A</td> <td>CN 108185954 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 22 June 2018 (2018-06-22) entire document</td> <td>1-11</td> </tr> <tr> <td>A</td> <td>CN 105286749 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 03 February 2016 (2016-02-03) entire document</td> <td>1-11</td> </tr> </tbody> </table>	Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.	A	CN 209315790 U (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 30 August 2019 (2019-08-30) description, paragraphs [0054]-[0112], and figures 1-22	1-11	PX	CN 110881926 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 17 March 2020 (2020-03-17) claims 1-11	1-11	PX	CN 211381188 U (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 01 September 2020 (2020-09-01) claims 1-11	1-11	A	CN 108185954 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 22 June 2018 (2018-06-22) entire document	1-11	A	CN 105286749 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 03 February 2016 (2016-02-03) entire document	1-11	☒ 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 “E” earlier application or patent but published on or after the international filing date “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) “O” document referring to an oral disclosure, use, exhibition or other means “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
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																	
A	CN 209315790 U (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 30 August 2019 (2019-08-30) description, paragraphs [0054]-[0112], and figures 1-22	1-11																	
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Date of the actual completion of the international search 08 February 2021	Date of mailing of the international search report 25 February 2021																		
Name and mailing address of the ISA/CN China National Intellectual Property Administration (ISA/ CN) No. 6, Xitucheng Road, Jimenqiao, Haidian District, Beijing 100088 China	Authorized officer																		
Facsimile No. (86-10)62019451	Telephone No.																		

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INTERNATIONAL SEARCH REPORT

International application No. PCT/CN2020/133113

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C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 206206732 U (GREE ELECTRIC APPLIANCES, INC. OF ZHUHAI) 31 May 2017 (2017-05-31) entire document	1-11
A	CN 110495838 A (QINGDAO HAIER DISHWASHER CO., LTD.) 26 November 2019 (2019-11-26) entire document	1-11
A	US 2017105596 A1 (ELECTROLUX HOME PRODUCT, INC.) 20 April 2017 (2017-04-20) entire document	1-11

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

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Patent document cited in search report				Publication date (day/month/year)		Patent family member(s)		Publication date (day/month/year)	
CN	209315790	U		30 August 2019		CN	111358405	A	03 July 2020
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REFERENCES CITED IN THE DESCRIPTION

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