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(54) **WATER PATH SYSTEM OF DISHWASHER**

(57) Disclosed is a waterway system of a dishwasher, thereby improving the cleaning cleanliness of tableware. The waterway system includes a base and a liner. The liner is mounted on the base, has a frame-shaped structure with an opening at a front side, is internally provided upper, lower, side and small spray arms, and is provided with a cup at the bottom; the cup is detachably connected to the liner and mounted in the base, and is connected to a water-dividing valve which respectively communicates with the upper, lower, side and small spray arms; the upper and lower spray arms are distributed up and down; the small spray arm is located on a side surface of the lower spray arm; the upper, lower and small spray arms are rotatably connected relative to the liner; and the side spray arm is detachably connected to a side wall of the liner.

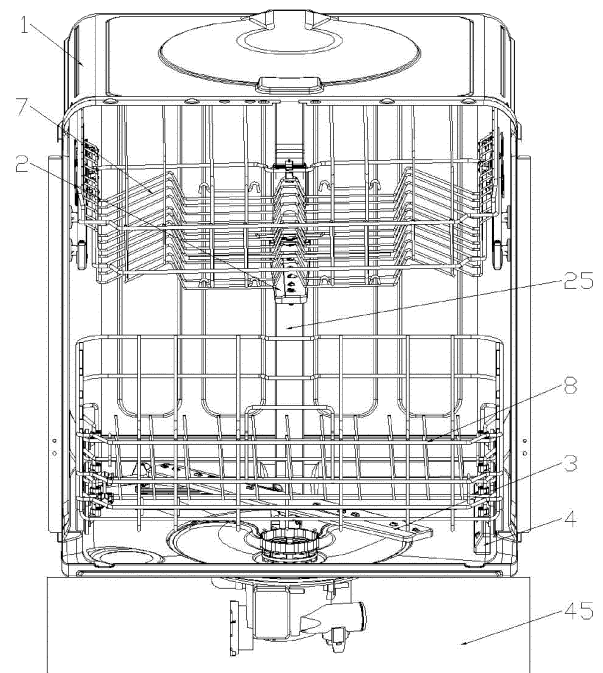


FIG. 1

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Description

TECHNICAL FIELD

[0001] The present invention relates to the related technical field of dishwashers, and in particular to a waterway system of a dishwasher.

BACKGROUND

[0002] A dishwasher is a device that automatically cleans tableware such as bowls, chopsticks, plates, dishes, knives and forks. Fully automatic dishwashers in the market can be divided into two categories: domestic and commercial. Domestic fully automatic dishwashers are only suitable for families, mainly including a cabinet type, a desktop type, a sink integrated type and an integrated type. Commercial dishwashers can be divided into five categories according to the structure: a cabinet type, a hood type, a basket transfer type, a belt transfer type and an ultrasonic type. The dishwasher, as an electrical appliance for cleaning tableware in the family, is required to wash and rinse the tableware in the dishwashing process.

[0003] The patent with the China patent number CN209220196U and the authorization announcement date being August 9, 2019 discloses a waterway system of a dishwasher, including a cup, where external water enters the cup from a water inlet valve of a water inlet, the cup is connected to a motor pump, the motor pump is connected to a water divider assembly, the motor pump starts to pump water in the cup into the water divider assembly, and then the water is respectively guided into an upper spray arm assembly, a middle spray arm assembly and a lower spray arm assembly to clean tableware. Wastewater discharged after cleaning is filtered by a filter system assembly and then pumped out by a water pump.

[0004] According to the content disclosed by the above patent, that is, the corresponding drawings, in the prior art, a spray arm system in the dishwasher is mostly distributed at the center of the dishwasher and rotates under the action of water pressure to drive a water column to rotate, thereby increasing the washing area of tableware. There are often some problems in the design of this structure: 1. for stubborn stains, the water column cannot wash the stains for a long time continuously, so that the tableware cannot be washed cleanly; and 2. due to the insufficient washing strength for the tableware located at the edge of a dishwashing basket, the tableware is often not cleaned properly, so that the tableware cannot be washed cleanly.

SUMMARY

[0005] To overcome the defect in the prior art that tableware cannot be washed cleanly, the present invention provides a waterway system of a dishwasher, there-

by improving the cleaning cleanliness of the tableware.

[0006] To achieve the foregoing objective, the present invention adopts the following technical solution:

[0007] A waterway system of a dishwasher includes a base and a liner, where the liner is mounted on the base; the liner has a frame-shaped structure with an opening at a front side; an upper spray arm, a lower spray arm, a side spray arm and a small spray arm are arranged in the liner; a cup is arranged at the bottom of the liner; the cup is detachably connected to the liner and located in the base; the cup is connected to a water-dividing valve; the water-dividing valve respectively communicates with the upper spray arm, the lower spray arm, the side spray arm and the small spray arm; the upper spray arm and the lower spray arm are distributed up and down; the small spray arm is located on a side surface of the lower spray arm; the upper spray arm, the lower spray arm and the small spray arm are rotatably connected relative to the liner; and the side spray arm is detachably connected to a side wall of the liner.

[0008] The liner is mounted on the base; the liner has a frame-shaped structure with an opening at a front side; an upper spray arm, a lower spray arm, a side spray arm and a small spray arm are arranged in the liner; a cup is arranged at the bottom of the liner; the cup is detachably connected to the liner and located in the base; the cup is connected to a water-dividing valve; the water-dividing valve respectively communicates with the upper spray arm, the lower spray arm, the side spray arm and the small spray arm; the upper spray arm and the lower spray arm are distributed up and down; the small spray arm is located on a side surface of the lower spray arm; the upper spray arm, the lower spray arm and the small spray arm are rotatably connected relative to the liner; and the side spray arm is detachably connected to a side wall of the liner. An external water source is controlled by the water-dividing valve to convey water into the corresponding spray arm to clean the tableware. The side spray arm is fixedly connected to the side wall of the liner, which is beneficial for an operator to place tableware with stubborn stains at a specific position, so that the side spray arm can intensively and continuously wash the stains for a long time during work, and the cleaning cleanliness of the tableware can be improved.

[0009] As a preference, an upper bowl basket and a lower bowl basket are arranged in the liner; the upper bowl basket and the lower bowl basket are distributed in a height direction of the liner and are detachably connected to the liner; the upper spray arm is located between the upper bowl basket and the lower bowl basket and corresponds to the bottom of the upper bowl basket; the upper spray arm is located at the top of the lower bowl basket; and the lower spray arm is located at the bottom of the lower bowl basket. A water column sprayed by the upper spray arm can wash tableware in the upper bowl basket, and the upper spray arm rotates under the action of water pressure, so that the contact range between the water column and the tableware in the upper bowl basket can

be increased, thereby improving the cleaning strength of the tableware. A water column sprayed by the lower spray arm can wash tableware in the lower bowl basket, and the lower spray arm rotates under the action of water pressure, so that the contact range between the water column and the tableware in the lower bowl basket can be increased, thereby improving the cleaning strength of the tableware.

[0010] As a preference, the side spray arm is located at a bottom edge of the liner and at the bottom of the lower bowl basket; one side of the side spray arm is detachably connected to the side wall of the liner; the corresponding other side of the side spray arm is provided with an inclined surface I corresponding to the lower bowl basket; and the inclined surface I is provided with a plurality of spray holes I distributed uniformly. A plurality of side spray arms may be provided, which may be respectively arranged on a rear side, a left side or a right side of the liner and can be arranged flexibly according to actual requirements. This solution provides an embodiment. The operator can place the tableware with stubborn stains at a specific position in the lower bowl basket, so that the side spray arm can intensively and continuously wash the stains for a long time during work, thereby improving the cleaning cleanliness of the tableware. The side spray arm is provided with an inclined surface I, so that the spray holes I can correspond to the specific position in the lower bowl basket. On one hand, it is beneficial for the side spray arm to be mounted at the bottom edge of the liner to prevent the side spray arm from interfering with the lower spray arm, and it is beneficial to save space; and on the other hand, it is beneficial to prevent food residues from accumulating on the surface, even blocking the spray holes I, thereby keeping the interior of the liner clean.

[0011] As another preference, the side spray arm is located between the upper bowl basket and the lower bowl basket, one side of the side spray arm is detachably connected to the side wall of the liner, the corresponding other side of the side spray arm is provided with an inclined surface I corresponding to the upper bowl basket, and the inclined surface I is provided with a plurality of spray holes I distributed uniformly. A plurality of side spray arms may be provided, which may be respectively arranged on a rear side, a left side or a right side of the liner, may also be arranged to clean tableware in the upper bowl basket and the lower bowl basket, and can be arranged flexibly according to actual requirements. This solution provides another embodiment. The operator can place the tableware with stubborn stains at a specific position in the upper bowl basket, so that the side spray arm can intensively and continuously wash the stains for a long time during work, thereby improving the cleaning cleanliness of the tableware.

[0012] As a preference, one side of the side spray arm detachably connected to the side wall of the liner is provided with an internal thread groove and a connecting hole; the internal thread groove is located at one end of

the side spray arm; the connecting hole is located at the other end of the side spray arm and communicates with the interior of the side spray arm; the liner is provided with through holes respectively in one-to-one correspondence with the internal thread groove and the connecting hole; a fastening screw is arranged in the internal thread groove; a fastening washer and a sealing pad are sleeved on the fastening screw sequentially; the side spray arm is hermetically connected to the liner through the matching of the internal thread groove and the fastening screw; an adapter is arranged in the connecting hole; a seal ring I is sleeved at one end of the adapter, the one end of the adapter is hermetically connected to the connecting hole through the seal ring I, and an L-shape joint is arranged at the other end of the adapter; a seal ring II is arranged on the L-shaped joint; the L-shaped joint penetrates through the corresponding through hole and is hermetically connected to the adapter through the seal ring II; and the side spray arm communicates with the water-dividing valve sequentially through the adapter and the L-shaped joint. The fastening screw and the adapter respectively fix the side spray arm and the liner, so that it is beneficial to ensure that the levelness of the side spray arm is kept stable, thereby effectively aligning with the specific position in the upper bowl basket or the lower bowl basket and facilitating the effective cleaning of the table with stubborn stains. Meanwhile, by the structure, the side spray arm is convenient to be fixed with the liner and disassembled at the same time. The L-shaped joint is convenient to be connected to a corresponding channel on the water-dividing valve through a pipeline.

[0013] As a preference, a water outlet channel is formed at one side of the cup, and the water-dividing valve is connected to the other side of the cup; the bottom edge of the liner gradually sinks towards a center thereof; a mounting groove is formed at the bottom center of the liner, and the mounting groove is located in the liner; a mounting hole matched with the cup is formed at the bottom of the mounting groove; a filter corresponding to the water outlet channel and a seal cover corresponding to the water-dividing valve are arranged in the mounting groove; and the filter and the seal cover are detachably connected to the mounting groove. The bottom edge in the liner gradually sinks towards the center of the liner, so that it is beneficial for sewage after washing to flow to the bottom center of the liner and then be discharged from a water outlet channel through the filtration of a filter.

[0014] As preference, a U-shaped water channel is formed in the liner, and the bottom of the U-shaped water channel is connected to a rear side wall of the liner; one side of the U-shaped water channel is located between the upper bowl basket and the lower bowl basket and is in a suspended state, and the other side of the U-shaped water channel is located at the bottom of the liner; the upper spray arm is horizontally rotatably connected to one side of an open end of the U-shaped water channel; the upper spray arm communicates with the water-dividing valve after sequentially passing through the U-

shaped water channel and an area formed by the seal cover and the cup; a shaft pipe is arranged on the seal cover; one end of the shaft pipe is fixedly connected to the seal cover; the other side of the open end of the U-shaped water channel is connected to the seal cover through a side wall of the shaft pipe; the other side of the U-shaped water channel is located between the lower spray arm and the seal cover; the seal cover is located outside the open end of the U-shaped water channel; the upper spray arm and the lower spray arm are located in the open end of the U-shaped water channel; the center of the lower spray arm is hermetically inserted in the other end of the shaft pipe and is horizontally rotatably connected to the seal cover through the shaft pipe; the lower spray arm communicates with the water-dividing valve after sequentially passing through the shaft pipe and the area formed by the seal cover and the cup; a water-dividing channel is formed at one side of the U-shaped water channel located at the bottom of the liner; the water-dividing channel is located on a side surface of the U-shaped water channel; one end of the water-dividing channel is connected to and communicates with the U-shaped water channel; the small spray arm is located at the other end of the water-dividing channel; the center of the small spray arm is rotatably connected to the water-dividing channel; the small spray arm is located at an end part of the lower spray arm and located between the lower spray arm and the seal cover; the small spray arm communicates with the water-dividing valve after sequentially passing through the water-dividing channel, the U-shaped water channel and the area formed by the seal cover and the cup; and channels formed by the upper spray arm, the lower spray arm, the small spray arm and the side spray arm respectively communicating with the water-dividing valve are independent of each other. Pipelines communicating with the upper spray arm and the lower spray arm are respectively arranged in the area formed by the seal cover and the cup, and each spray arm communicates with the water-dividing valve through the corresponding pipeline, so it is beneficial for the water-dividing valve to control the opening and closing of each pipeline to implement the working state of each spray arm. The small spray arm rotates under the action of water pressure, which is convenient to enlarge the cleaning range of tableware by the water column. Meanwhile, due to the position layout of the small spray arm, on one hand, the small spray arm is prevented from interfering with the lower spray arm, and on the other hand, it is convenient to wash the position which is located at the edge of the dishwashing basket and is difficult to be washed by the upper spray arm and the lower spray arm, thereby improving the cleaning strength of tableware. Channels formed by the upper spray arm, the lower spray arm, the small spray arm and the side spray arm respectively communicating with the water-dividing valve are independent of each other, so that it is convenient for the water-dividing valve to control the opening and closing of each pipeline to implement the working state of

each spray arm.

[0015] As a preference, the small spray arm is in a radial shape formed by a plurality of supporting blocks extending from the inside to the outside; one end of each of the plurality of supporting blocks is converged to form the center of the small spray arm, and the other ends of the supporting blocks are provided with spray holes II; the spray holes II communicate with the center of the small spray arm through the interiors of the supporting blocks; an inclined edge is arranged at the edge of one side of each of the supporting blocks; the spray holes II are located at the joints of the edges and the tops of the supporting blocks; the water-dividing channel is located at the bottoms of the supporting blocks; each of the spray holes II is provided with a flow guide wall in a circumferential direction thereof; and one end of the flow guide wall is fixedly connected to the top of each of the supporting blocks, and the other end of the flow guide wall forms a diagonal plane and then is connected and fixed to the edge. The spray holes II are located at end parts of the supporting blocks, so that the washing range of the water column is enlarged when the small spray arm rotates under the action of water pressure. Due to the edge, it is beneficial to reduce noise when the small spray arm rotates. Meanwhile, due to the design of the flow guide wall, water columns sprayed from the spray holes II are more stable. The other end of the flow guide wall forms a diagonal plane, so that the water columns sprayed from the spray holes II are sprayed obliquely upward, and the water columns can be straightened reversely under the action of inertia when the small spray arm rotates, thereby increasing the impact height of the water column, making the water column be in full contact with the tableware, and improving the cleaning strength of the tableware.

[0016] As a preference, a rectangular cavity is formed in the side spray arm; the spray holes I are located at the top of the rectangular cavity; the spray holes I communicate with the water-dividing valve through the rectangular cavity; a valve block is arranged in the rectangular cavity; the valve block completely covers the plurality of spray holes I and is hermetically and slidably connected to a side wall of the rectangular cavity; an inflating cylinder is arranged at the bottom of the side spray arm, and the inflating cylinder is arranged horizontally; the inflating cylinder is hermetically connected to the side spray arm; a flow hole is formed at the bottom of the rectangular cavity; the rectangular cavity communicates with one end of the inflating cylinder through the flow hole; a seal valve is arranged in the inflating valve; a valve rod is arranged on the seal valve; one end of the valve rod is located in the inflating cylinder and fixedly connected to the seal valve, and the other end of the valve rod penetrates through the other end of the inflating cylinder and located outside the inflating cylinder; one end of the valve rod located outside the inflating cylinder is provided with a pull rod perpendicular thereto; one end of the pull rod is fixedly connected to the valve rod, and the other end of the pull rod is located

at the top of the side spray arm; the pull rod is located between the side spray arm and the side wall of the liner; the seal valve is driven by the pull rod to be horizontally slidingly connected to the inflating cylinder; and the valve block is driven by the pull rod to be slidingly connected to the rectangular cavity up and down. According to the stubbornness of stains or the impact force of water that can be borne by the cleaning object, the operator can flexibly adjust the water flow rate of the side spray arm. The operator pushes the pull rod to drive the seal valve to horizontally slide in the inflating cylinder to change the quantity of the air at the bottom of the valve block, and the valve block is driven through the power action of the air to slide up and down, so that the open sizes of the plurality of spray holes I are changed at the same time, the water flow rate of the side spray arm can be adjusted, and the operation is convenient and rapid.

[0017] As a preference, the thickness of the valve block is gradually increased from the top to the bottom; one side of the valve block is provided with an inclined surface II, and the corresponding other side of the valve block completely covers the spray holes I; the inclined surface II is provided with a V-shaped guide groove; the V-shaped guide groove is located at the center of the valve block; an included angle formed by a top edge of the V-shaped guide groove and the inclined surface II is 90 degrees; a bottom edge of the V-shaped guide groove is arranged horizontally; a push plate in flush with the bottom edge of the V-shaped guide groove penetrates through one side of the rectangular cavity, and the spray holes I are located at the corresponding other side of the rectangular cavity; the push plate is hermetically and horizontally slidingly connected to one side of a rectangular hole; one end of the push plate is located in the V-shaped guide groove, and the other end of the push plate is located outside the rectangular cavity and fixedly connected to the pull rod; a stop block is arranged at the joint of the top edge of the V-shaped guide groove and the inclined surface II; the stop block is located in the V-shaped guide groove and fixedly connected to a side wall of the V-shaped guide groove; and a stop groove matched with the stop block is formed at one end of the push plate located at the V-shaped guide valve. The valve block required to be used cooperatively with the long side spray arm will be correspondingly longer. For the side spray arm mounted at the bottom edge of the liner, the bottom space of the side spray arm is limited, so if the valve block is driven to slide up and down simply by changing the quantity of the air through the seal valve in the inflating cylinder, the effect of adjusting the open sizes of the spray holes I is not good. Therefore, based on this, the V-shaped guide groove is formed at the center of the valve block, so that the operator pushes the pull rod to drive the seal valve to horizontally slide in the inflating cylinder to change the quantity of the air at the bottom of the valve block, and the valve block is driven through the power action of the air to slide upward to overcome a large friction force caused by the sealed connection between the valve block and the side wall

of the rectangular cavity, thereby facilitating the mutual cooperation between the push plate and the top edge of the V-shaped guide groove to drive the valve block to slide upward, enabling the valve block to slide upward in a balanced state, improving the effect of adjusting the open sizes of the spray holes I, and saving labor in operation. The stop groove is matched with the stop block, so it is beneficial to prevent the push plate from being separated from the V-shaped guide groove and improve the stability of the structure.

[0018] The present invention has the following beneficial effects: The operator places the tableware with stubborn stains at the specific position, so that the side spray arm can intensively and continuously wash the stains for a long time during work, and the cleaning cleanliness of the tableware can be improved. The side spray arm is provided with the inclined surface I, so that the spray holes I can correspond to the specific position in the lower bowl basket. On one hand, it is beneficial for the side spray arm to be mounted at the bottom edge of the liner to prevent the side spray arm from interfering with the lower spray arm, and it is beneficial to save space; and on the other hand, it is beneficial to prevent food residues from accumulating on the surface, even blocking the spray holes I, thereby keeping the interior of the liner clean. The fastening screw and the adapter respectively fix the side spray arm and the liner, so that it is beneficial to ensure that the levelness of the side spray arm is kept stable, thereby effectively aligning with the specific position in the upper bowl basket or the lower bowl basket and facilitating the effective cleaning of the table with stubborn stains. Meanwhile, by the structure, the side spray arm is convenient to be fixed with the liner and disassembled at the same time. The small spray arm rotates under the action of water pressure, which is convenient to enlarge the cleaning range of tableware by the water column. Meanwhile, due to the position layout of the small spray arm, on one hand, the small spray arm is prevented from interfering with the lower spray arm, and on the other hand, it is convenient to wash the position which is located at the edge of the dish-washing basket and is difficult to be washed by the upper spray arm and the lower spray arm, thereby improving the cleaning strength of tableware. The spray holes II are located at end parts of the supporting blocks, so that the washing range of the water column is enlarged when the small spray arm rotates under the action of water pressure. Due to the edge, it is beneficial to reduce noise when the small spray arm rotates. Meanwhile, due to the design of the flow guide wall, water columns sprayed from the spray holes II are more stable. The other end of the flow guide wall forms a diagonal plane, so that the water columns sprayed from the spray holes II are sprayed obliquely upward, and the water columns can be straightened reversely under the action of inertia when the small spray arm rotates, thereby increasing the impact height of the water column, making the water column be in full contact with the tableware, and improving the cleaning

strength of the tableware. According to the stubbornness of stains or the impact force of water that can be borne by the cleaning object, the operator can flexibly adjust the water flow rate of the side spray arm, and the operation is convenient and rapid. It is beneficial to improve the effect of adjusting the open sizes of the spray holes I and save labor in operation.

BRIEF DESCRIPTION OF THE DRAWINGS

[0019]

FIG. 1 is a schematic structural diagram of the present invention;

FIG. 2 is an exploded view of FIG. 1;

FIG. 3, FIG. 4 and FIG. 5 are structural schematic diagrams of a side spray arm located at a bottom edge of a liner;

FIG. 6, FIG. 7 and FIG. 8 are structural schematic diagrams of a side spray arm located between an upper bowl basket and a lower bowl basket;

FIG. 9 is a schematic structural diagram of the bottom of a liner;

FIG. 10 is a structural sectional view of C-C in FIG. 9;

FIG. 11 is a structural enlarged view of a position A in FIG. 10;

FIG. 12 is a structural enlarged view of a position B in FIG. 10;

FIG. 13 is an exploded view of the bottom of a liner;

FIG. 14 is a schematic diagram of waterway connection of each spray arm;

FIG. 15 is a structural schematic diagram of a small spray arm;

FIG. 16 is a structural schematic diagram of a side spray arm;

FIG. 17 is a structural sectional view of D-D in FIG. 16; and

FIG. 18 is a structural schematic diagram of a valve block.

[0020] The description of reference numerals is as follow: 1. liner, 2. upper spray arm, 3. lower spray arm, 4. side spray arm, 5. cup, 6. water-dividing valve, 7. upper bowl basket, 8. lower bowl basket, 9. inclined surface I, 10. spray holes I, 11. internal thread groove, 12. con-

necting hole, 13. hole, 14. fastening screw, 15. fastening washer, 16. sealing pad, 17. adapter, 18. seal ring I, 19. L-shaped joint, 20. water outlet channel, 21. mounting groove, 22. mounting hole, 23. filter, 24. seal cover, 25. U-shaped water channel, 26. shaft pipe, 27. water-dividing channel, 28. small spray arm, 29. supporting blocks, 30. spray holes II, 31. inclined edge, 32. flow guide wall, 33. rectangular cavity, 34. valve block, 35. inflating cylinder, 36. flow hole, 37. seal valve, 38. valve rod, 39. pull rod, 40. inclined surface II, 41. V-shaped guide groove, 42. push plate, 43. stop block, 44. stop groove, 45. base, 46. seal ring II.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0021] The present invention is further described in detail below with reference to the accompanying drawings and the specific embodiments.

[0022] In the embodiments shown in FIG. 1 and FIG. 2, a waterway system of a dishwasher includes a base 45 and a liner 1, where the liner 1 is mounted on the base 45; the liner 1 has a frame-shaped structure with an opening at a front side; an upper spray arm 2, a lower spray arm 3, a side spray arm 4 and a small spray arm 28 are arranged in the liner 1; a cup 5 is arranged at the bottom of the liner 1; the cup 5 is detachably connected to the liner 1 and located in the base 45; the cup 5 is connected to a water-dividing valve 6; the water-dividing valve 6 respectively communicates with the upper spray arm 2, the lower spray arm 3, the side spray arm 4 and the small spray arm 28; the upper spray arm 2 and the lower spray arm 3 are distributed up and down; the small spray arm 28 is located on a side surface of the lower spray arm 3; the upper spray arm 2, the lower spray arm 3 and the small spray arm 28 are rotatably connected relative to the liner 1; and the side spray arm 4 is fixedly connected to a side wall of the liner 1.

[0023] As shown in FIG. 1 and FIG. 2, an upper bowl basket 7 and a lower bowl basket 8 are arranged in the liner 1; the upper bowl basket 7 and the lower bowl basket 8 are distributed in a height direction of the liner 1 and are detachably connected to the liner 1; the upper spray arm 2 is located between the upper bowl basket 7 and the lower bowl basket 8 and corresponds to the bottom of the upper bowl basket 7; the upper spray arm 2 is located at the top of the lower bowl basket 8; and the lower spray arm 3 is located at the bottom of the lower bowl basket 8.

[0024] As shown in FIG. 3, FIG. 4 and FIG. 5, the side spray arm 4 is located at a bottom edge of the liner 1 and at the bottom of the lower bowl basket 8, one side of the side spray arm 4 is detachably connected to a side wall of the liner 1, the corresponding other side of the side spray arm 4 is provided with an inclined surface I 9 corresponding to the lower bowl basket 8, and the inclined surface I 9 is provided with a plurality of spray holes I 10 distributed uniformly.

[0025] As shown in FIG. 6, FIG. 7 and FIG. 8, the side spray arm 4 is located between the upper bowl basket 7

and the lower bowl basket 8, one side of the side spray arm 4 is detachably connected to a side wall of the liner 1, the corresponding other side of the side spray arm 4 is provided with an inclined surface I 9 corresponding to the upper bowl basket 7, and the inclined surface I 9 is provided with a plurality of spray holes I 10 distributed uniformly.

[0026] As shown in FIG. 9, FIG. 10, FIG. 11, FIG. 12 and FIG. 13, one side of the side spray arm 4 detachably connected to the side wall of the liner 1 is provided with an internal thread groove 11 and a connecting hole 12; the internal thread groove 11 is located at one end of the side spray arm 4; the connecting hole 12 is located at the other end of the side spray arm 4 and communicates with the interior of the side spray arm 4; the liner 1 is provided with through holes 13 respectively in one-to-one correspondence with the internal thread groove 11 and the connecting hole 12; a fastening screw 14 is arranged in the internal thread groove 11; a fastening washer 15 and a sealing pad 16 are sleeved on the fastening screw 14 sequentially; the side spray arm 4 is hermetically connected to the liner 1 through the matching of the internal thread groove 11 and the fastening screw 14; an adapter 17 is arranged in the connecting hole 12; a seal ring I 18 is sleeved at one end of the adapter 17, the one end of the adapter 17 is hermetically connected to the connecting hole 12 through the seal ring I 18, and an L-shape joint 19 is arranged at the other end of the adapter 17; a seal ring II 46 is arranged on the L-shaped joint 19; the L-shaped joint 19 penetrates through the corresponding through hole 13 and is hermetically connected to the adapter 17 through the seal ring II 46; and the side spray arm 4 communicates with the water-dividing valve 6 sequentially through the adapter 17 and the L-shaped joint 19.

[0027] As shown in FIG. 1, FIG. 2 and FIG. 14, a water outlet channel 20 is formed at one side of the cup 5, and the water-dividing valve 6 is connected to the other side of the cup 5; the bottom edge of the liner 1 gradually sinks towards a center thereof; a mounting groove 21 is formed at the bottom center of the liner 1, and the mounting groove 21 is located in the liner 1; a mounting hole 22 matched with the cup 5 is formed at the bottom of the mounting groove 21; a filter 23 corresponding to the water outlet channel 20 and a seal cover 24 corresponding to the water-dividing valve 6 are arranged in the mounting groove 21; and the filter 23 and the seal cover 24 are detachably connected to the mounting groove 21.

[0028] As shown in FIG. 1, FIG. 2 and FIG. 14, a U-shaped water channel 25 is formed in the liner 1, and the bottom of the U-shaped water channel 25 is connected to a rear side wall of the liner 1; one side of the U-shaped water channel 25 is located between the upper bowl basket 7 and the lower bowl basket 8 and is in a suspended state, and the other side of the U-shaped water channel 25 is located at the bottom of the liner 1; the upper spray arm 2 is horizontally rotatably connected to one side of an open end of the U-shaped water channel 25; the upper spray arm 2 communicates with the water-

dividing valve 6 after sequentially passing through the U-shaped water channel 25 and an area formed by the seal cover 24 and the cup 5; a shaft pipe 26 is arranged on the seal cover 24; one end of the shaft pipe 26 is fixedly connected to the seal cover 24; the other side of the open end of the U-shaped water channel 25 is connected to the seal cover 24 through a side wall of the shaft pipe 26; the other side of the U-shaped water channel 25 is located between the lower spray arm 3 and the seal cover 24; the seal cover 24 is located outside the open end of the U-shaped water channel 25; the upper spray arm 2 and the lower spray arm 3 are located in the open end of the U-shaped water channel 25; the center of the lower spray arm 3 is hermetically inserted in the other end of the shaft pipe 26 and is horizontally rotatably connected to the seal cover 24 through the shaft pipe 26; the lower spray arm 3 communicates with the water-dividing valve 6 after sequentially passing through the shaft pipe 26 and the area formed by the seal cover 24 and the cup 5; a water-dividing channel 27 is formed at one side of the U-shaped water channel 25 located at the bottom of the liner 1; the water-dividing channel 27 is located on a side surface of the U-shaped water channel 25; one end of the water-dividing channel 27 is connected to and communicates with the U-shaped water channel 25; the small spray arm 28 is located at the other end of the water-dividing channel 27; the center of the small spray arm 28 is rotatably connected to the water-dividing channel 27; the small spray arm 28 is located at an end part of the lower spray arm 3 and located between the lower spray arm 3 and the seal cover 24; the small spray arm 28 communicates with the water-dividing valve 6 after sequentially passing through the water-dividing channel 27, the U-shaped water channel 25 and the area formed by the seal cover 24 and the cup 5; and channels formed by the upper spray arm 2, the lower spray arm 3, the small spray arm 28 and the side spray arm 4 respectively communicating with the water-dividing valve 6 are independent of each other.

[0029] As shown in FIG. 15, the small spray arm 28 is in a radial shape formed by a plurality of supporting blocks 29 extending from the inside to the outside; one end of each of the plurality of supporting blocks 29 is converged to form the center of the small spray arm 28, and the other ends of the supporting blocks 29 are provided with spray holes II 30; the spray holes II 30 communicate with the center of the small spray arm 28 through the interiors of the supporting blocks 29; an inclined edge 31 is arranged at the edge of one side of each of the supporting blocks 29; the spray holes II 30 are located at the joints of the edges 31 and the tops of the supporting blocks 29; the water-dividing channel 27 is located at the bottoms of the supporting blocks 29; each of the spray holes II 30 is provided with a flow guide wall 32 in a circumferential direction thereof; and one end of the flow guide wall 32 is fixedly connected to the top of each of the supporting blocks 29, and the other end of the flow guide wall 32 forms a diagonal plane and then is connected and fixed to the edge 31.

[0030] As shown in FIG. 16, FIG. 17 and FIG. 18, a rectangular cavity 33 is formed in the side spray arm 4; the spray holes I 10 are located at the top of the rectangular cavity 33; the spray holes I 10 communicate with the water-dividing valve 6 through the rectangular cavity 33; a valve block 34 is arranged in the rectangular cavity 33; the valve block 34 completely covers the plurality of spray holes I 10 and is hermetically and slidingly connected to a side wall of the rectangular cavity 33; an inflating cylinder 35 is arranged at the bottom of the side spray arm 4, and the inflating cylinder 35 is arranged horizontally; the inflating cylinder 35 is hermetically connected to the side spray arm 4; a flow hole 36 is formed at the bottom of the rectangular cavity 33; the rectangular cavity 33 communicates with one end of the inflating cylinder 35 through the flow hole 36; a seal valve 37 is arranged in the inflating valve 35; a valve rod 38 is arranged on the seal valve 37; one end of the valve rod 38 is located in the inflating cylinder 35 and fixedly connected to the seal valve 37, and the other end of the valve rod 38 penetrates through the other end of the inflating cylinder 35 and located outside the inflating cylinder 35; one end of the valve rod 38 located outside the inflating cylinder 35 is provided with a pull rod 39 perpendicular thereto; one end of the pull rod 39 is fixedly connected to the valve rod 38, and the other end of the pull rod 39 is located at the top of the side spray arm 4; the pull rod 39 is located between the side spray arm 4 and the side wall of the liner 1; the seal valve 37 is driven by the pull rod 39 to be horizontally slidingly connected to the inflating cylinder 35; and the valve block 34 is driven by the pull rod 39 to be slidingly connected to the rectangular cavity 33 up and down.

[0031] As shown in FIG. 17 and FIG. 18, the thickness of the valve block 34 is gradually increased from the top to the bottom; one side of the valve block 34 is provided with an inclined surface II 40, and the corresponding other side of the valve block 34 completely covers the spray holes I 10; the inclined surface II 40 is provided with a V-shaped guide groove 41; the V-shaped guide groove 41 is located at the center of the valve block 34; an included angle formed by a top edge of the V-shaped guide groove 41 and the inclined surface II 40 is 90 degrees; a bottom edge of the V-shaped guide groove 41 is arranged horizontally; a push plate 42 in flush with the bottom edge of the V-shaped guide groove 41 penetrates through one side of the rectangular cavity 33, and the spray holes I 10 are located at the corresponding other side of the rectangular cavity 33; the push plate 42 is hermetically and horizontally slidingly connected to one side of a rectangular hole; one end of the push plate 42 is located in the V-shaped guide groove 41, and the other end of the push plate 42 is located outside the rectangular cavity 33 and fixedly connected to the pull rod 39; a stop block 43 is arranged at the joint of the top edge of the V-shaped guide groove 41 and the inclined surface II 40; the stop block 43 is located in the V-shaped guide groove 41 and fixedly connected to a side wall of the V-shaped guide groove 41; and a stop groove 44 matched with the stop block 43 is

formed at one end of the push plate 42 located at the V-shaped guide valve 41.

[0032] An external water source is controlled by the water-dividing valve 6 to convey water into the corresponding spray arm to clean the tableware. The side spray arm 4 is fixedly connected to the side wall of the liner 1, which is beneficial for an operator to place tableware with stubborn stains at a specific position, so that the side spray arm 4 can intensively and continuously wash the stains for a long time during work, and the cleaning cleanliness of the tableware can be improved. Specifically, a plurality of side spray arms 4 may be provided, which may be respectively arranged on a rear side, a left side or a right side of the liner 1, may also be arranged to clean tableware in the upper bowl basket 7 and the lower bowl basket 8, and can be arranged flexibly according to actual requirements.

[0033] Based on this, a specific embodiment provided by the present invention is: the operator can place the tableware with stubborn stains at a specific position in the lower bowl basket 8, so that the side spray arm 4 can intensively and continuously wash the stains for a long time during work, thereby improving the cleaning cleanliness of the tableware.

[0034] A specific embodiment further provided by the present invention is: the operator can place the tableware with stubborn stains at a specific position in the upper bowl basket 7, so that the side spray arm 4 can intensively and continuously wash the stains for a long time during work, thereby improving the cleaning cleanliness of the tableware.

[0035] The side spray arm 4 is provided with an inclined surface I 9, so that the spray holes I 10 can correspond to the specific position in the lower bowl basket 8. On one hand, it is beneficial for the side spray arm 4 to be mounted at the bottom edge of the liner 1 to prevent the side spray arm from interfering with the lower spray arm 3, and it is beneficial to save space; and on the other hand, it is beneficial to prevent food residues from accumulating on the surface, even blocking the spray holes I 10, thereby keeping the interior of the liner 1 clean.

[0036] Meanwhile, a water column sprayed by the upper spray arm 2 can wash tableware in the upper bowl basket 7, and the upper spray arm 2 rotates under the action of water pressure, so that the contact range between the water column and the tableware in the upper bowl basket 7 can be increased, thereby improving the cleaning strength of the tableware. A water column sprayed by the lower spray arm 3 can wash tableware in the lower bowl basket 8, and the lower spray arm 3 rotates under the action of water pressure, so that the contact range between the water column and the tableware in the lower bowl basket 8 can be increased, thereby improving the cleaning strength of the tableware.

[0037] The small spray arm 28 rotates under the action of water pressure, and water columns are sprayed by the spray holes II 30 on the supporting blocks 29 to wash the position which is located at the edge of the dishwashing

basket and is difficult to be washed by the upper spray arm 2 and the lower spray arm 3, thereby improving the cleaning strength of tableware. Channels formed by the upper spray arm 2, the lower spray arm 3, the small spray arm 28 and the side spray arm 4 respectively communicating with the water-dividing valve 6 are independent of each other, so that it is convenient for the water-dividing valve 6 to control the opening and closing of each pipeline to implement the working state of each spray arm.

[0038] The bottom edge in the liner 1 gradually sinks towards the center of the liner, so that it is beneficial for sewage after washing to flow to the bottom center of the liner 1 and then be discharged from a water outlet channel 20 through the filtration of a filter 23.

[0039] The present invention further provides another embodiment, According to the stubbornness of stains or the impact force of water that can be borne by the cleaning object, the operator can flexibly adjust the water flow rate of the side spray arm 4. The operator pushes the pull rod 39 to drive the seal valve 37 to horizontally slide in the inflating cylinder 35 to change the quantity of the air at the bottom of the valve block 34, and the valve block 34 is driven through the power action of the air to slide up and down, so that the open sizes of the plurality of spray holes 10 are changed at the same time, the water flow rate of the side spray arm 4 can be adjusted, and the operation is convenient and rapid.

[0040] The valve block 34 required to be used cooperatively with the long side spray arm 4 will be correspondingly longer. For the side spray arm 4 mounted at the bottom edge of the liner 1, the bottom space of the side spray arm 4 is limited, so if the valve block 34 is driven to slide up and down simply by changing the quantity of the air through the seal valve 37 in the inflating cylinder 35, the effect of adjusting the open sizes of the spray holes 10 is not good. Therefore, based on this, the V-shaped guide groove 41 is formed at the center of the valve block 34, so that the operator pushes the pull rod 39 to drive the seal valve 37 in the inflating cylinder 35 to horizontally slide in the inflating cylinder 3 to change the quantity of the air at the bottom of the valve block 34, and the valve block 34 is driven through the power action of the air to slide upward to overcome a large friction force caused by the sealed connection between the valve block 34 and the side wall of the rectangular cavity 33, thereby facilitating the mutual cooperation between the push plate 42 and the top edge of the V-shaped guide groove 41 to drive the valve block 34 to slide upward, enabling the valve block 34 to slide upward in a balanced state, improving the effect of adjusting the open sizes of the spray holes 10, and saving labor in operation.

Claims

1. A waterway system of a dishwasher, comprising a base (45) and a liner (1), **characterized in that** the

liner (1) is mounted on the base (45); the liner (1) has a frame-shaped structure with an opening at a front side; an upper spray arm (2), a lower spray arm (3), a side spray arm (4) and a small spray arm (28) are arranged in the liner (1); a cup (5) is arranged at the bottom of the liner (1); the cup (5) is detachably connected to the liner (1) and located in the base (45); the cup (5) is connected to a water-dividing valve (6); the water-dividing valve (6) respectively communicates with the upper spray arm (2), the lower spray arm (3), the side spray arm (4) and the small spray arm (28); the upper spray arm (2) and the lower spray arm (3) are distributed up and down; the small spray arm (28) is located on a side surface of the lower spray arm (3); the upper spray arm (2), the lower spray arm (3) and the small spray arm (28) are rotatably connected relative to the liner (1); and the side spray arm (4) is fixedly connected to a side wall of the liner (1).

2. The waterway system of a dishwasher according to claim 1, **characterized in that** an upper bowl basket (7) and a lower bowl basket (8) are arranged in the liner (1); the upper bowl basket (7) and the lower bowl basket (8) are distributed in a height direction of the liner (1) and are detachably connected to the liner (1); the upper spray arm (2) is located between the upper bowl basket (7) and the lower bowl basket (8) and corresponds to the bottom of the upper bowl basket (7); the upper spray arm (2) is located at the top of the lower bowl basket (8); and the lower spray arm (3) is located at the bottom of the lower bowl basket (8).

3. The waterway system of a dishwasher according to claim 2, **characterized in that** the side spray arm (4) is located at a bottom edge of the liner (1) and at the bottom of the lower bowl basket (8); one side of the side spray arm (4) is detachably connected to the side wall of the liner (1); the corresponding other side of the side spray arm (4) is provided with an inclined surface I (9) corresponding to the lower bowl basket (8); and the inclined surface I (9) is provided with a plurality of spray holes I (10) distributed uniformly.

4. The waterway system of a dishwasher according to claim 2, **characterized in that** the side spray arm (4) is located between the upper bowl basket (7) and the lower bowl basket (8); one side of the side spray arm (4) is detachably connected to the side wall of the liner (1); the corresponding other side of the side spray arm (4) is provided with an inclined surface I (9) corresponding to the upper bowl basket (7); and the inclined surface I (9) is provided with a plurality of spray holes I (10) distributed uniformly.

5. The waterway system of a dishwasher according to claim 3 or 4, **characterized in that** one side of the

side spray arm (4) detachably connected to the side wall of the liner (1) is provided with an internal thread groove (11) and a connecting hole (12); the internal thread groove (11) is located at one end of the side spray arm (4); the connecting hole (12) is located at the other end of the side spray arm (4) and communicates with the interior of the side spray arm (4); the liner (1) is provided with through holes (13) respectively in one-to-one correspondence with the internal thread groove (11) and the connecting hole (12); a fastening screw (14) is arranged in the internal thread groove (11); a fastening washer (15) and a sealing pad (16) are sleeved on the fastening screw (14) sequentially; the side spray arm (4) is hermetically connected to the liner (1) through the matching of the internal thread groove (11) and the fastening screw (14); an adapter (17) is arranged in the connecting hole (12); a seal ring I (18) is sleeved at one end of the adapter (17), the one end of the adapter (17) is hermetically connected to the connecting hole (12) through the seal ring I (18), and an L-shape joint (19) is arranged at the other end of the adapter (17); a seal ring II (46) is arranged on the L-shaped joint (19); the L-shaped joint (19) penetrates through the corresponding through hole (13) and is hermetically connected to the adapter (17) through the seal ring II (46); and the side spray arm (4) communicates with the water-dividing valve (6) sequentially through the adapter (17) and the L-shaped joint (19).

6. The waterway system of a dishwasher according to claim 2 or 3 or 4, **characterized in that** a water outlet channel (20) is formed at one side of the cup (5), and the water-dividing valve (6) is connected to the other side of the cup (5); the bottom edge of the liner (1) gradually sinks towards a center thereof; a mounting groove (21) is formed at the bottom center of the liner (1), and the mounting groove (21) is located in the liner (1); a mounting hole (22) matched with the cup (5) is formed at the bottom of the mounting groove (21); a filter (23) corresponding to the water outlet channel (20) and a seal cover (24) corresponding to the water-dividing valve (6) are arranged in the mounting groove (21); and the filter (23) and the seal cover (24) are detachably connected to the mounting groove (21).

7. The waterway system of a dishwasher according to claim 6, **characterized in that** a U-shaped water channel (25) is formed in the liner (1), and the bottom of the U-shaped water channel (25) is connected to a rear side wall of the liner (1); one side of the U-shaped water channel (25) is located between the upper bowl basket (7) and the lower bowl basket (8) and is in a suspended state, and the other side of the U-shaped water channel (25) is located at the bottom of the liner (1); the upper spray arm (2) is horizontally rotatably connected to one side of an open end of the

U-shaped water channel (25); the upper spray arm (2) communicates with the water-dividing valve (6) after sequentially passing through the U-shaped water channel (25) and an area formed by the seal cover (24) and the cup (5); a shaft pipe (26) is arranged on the seal cover (24); one end of the shaft pipe (26) is fixedly connected to the seal cover (24); the other side of the open end of the U-shaped water channel (25) is connected to the seal cover (24) through a side wall of the shaft pipe (26); the other side of the U-shaped water channel (25) is located between the lower spray arm (3) and the seal cover (24); the seal cover (24) is located outside the open end of the U-shaped water channel (25); the upper spray arm (2) and the lower spray arm (3) are located in the open end of the U-shaped water channel (25); the center of the lower spray arm (3) is hermetically inserted in the other end of the shaft pipe (26) and is horizontally rotatably connected to the seal cover (24) through the shaft pipe (26); the lower spray arm (3) communicates with the water-dividing valve (6) after sequentially passing through the shaft pipe (26) and the area formed by the seal cover (24) and the cup (5); a water-dividing channel (27) is formed at one side of the U-shaped water channel (25) located at the bottom of the liner (1); the water-dividing channel (27) is located on a side surface of the U-shaped water channel (25); one end of the water-dividing channel (27) is connected to and communicates with the U-shaped water channel (25); the small spray arm (28) is located at the other end of the water-dividing channel (27); the center of the small spray arm (28) is rotatably connected to the water-dividing channel (27); the small spray arm (28) is located at an end part of the lower spray arm (3) and located between the lower spray arm (3) and the seal cover (24); the small spray arm (28) communicates with the water-dividing valve (6) after sequentially passing through the water-dividing channel (27), the U-shaped water channel (25) and the area formed by the seal cover (24) and the cup (5); and channels formed by the upper spray arm (2), the lower spray arm (3), the small spray arm (28) and the side spray arm (4) respectively communicating with the water-dividing valve (6) are independent of each other.

8. The waterway system of a dishwasher according to claim 7, **characterized in that** the small spray arm (28) is in a radial shape formed by a plurality of supporting blocks (29) extending from the inside to the outside; one end of each of the plurality of supporting blocks (29) is converged to form the center of the small spray arm (28), and the other ends of the supporting blocks (29) are provided with spray holes II (30); the spray holes II (30) communicate with the center of the small spray arm (28) through the interiors of the supporting blocks (29); an inclined edge (31) is arranged at the edge of one side of each of the

supporting blocks (29); the spray holes II (30) are located at the joints of the edges (31) and the tops of the supporting blocks (29); the water-dividing channel (27) is located at the bottoms of the supporting blocks (29); each of the spray holes II (30) is provided with a flow guide wall (32) in a circumferential direction thereof; and one end of the flow guide wall (32) is fixedly connected to the top of each of the supporting blocks (29), and the other end of the flow guide wall (32) forms a diagonal plane and then is connected and fixed to the edge (31).

9. The waterway system of a dishwasher according to claim 3 or 4, **characterized in that** a rectangular cavity (33) is formed in the side spray arm (4); the spray holes I (10) are located at the top of the rectangular cavity (33); the spray holes I (10) communicate with the water-dividing valve (6) through the rectangular cavity (33); a valve block (34) is arranged in the rectangular cavity (33); the valve block (34) completely covers the plurality of spray holes I (10) and is hermetically and slidingly connected to a side wall of the rectangular cavity (33); an inflating cylinder (35) is arranged at the bottom of the side spray arm (4), and the inflating cylinder (35) is arranged horizontally; the inflating cylinder (35) is hermetically connected to the side spray arm (4); a flow hole (36) is formed at the bottom of the rectangular cavity (33); the rectangular cavity (33) communicates with one end of the inflating cylinder (35) through the flow hole (36); a seal valve (37) is arranged in the inflating valve (35); a valve rod (38) is arranged on the seal valve (37); one end of the valve rod (38) is located in the inflating cylinder (35) and fixedly connected to the seal valve (37), and the other end of the valve rod (38) penetrates through the other end of the inflating cylinder (35) and located outside the inflating cylinder (35); one end of the valve rod (38) located outside the inflating cylinder (35) is provided with a pull rod (39) perpendicular thereto; one end of the pull rod (39) is fixedly connected to the valve rod (38), and the other end of the pull rod (39) is located at the top of the side spray arm (4); the pull rod (39) is located between the side spray arm (4) and the side wall of the liner (1); the seal valve (37) is driven by the pull rod (39) to be horizontally slidingly connected to the inflating cylinder (35); and the valve block (34) is driven by the pull rod (39) to be slidingly connected to the rectangular cavity (33) up and down.

10. The waterway system of a dishwasher according to claim 9, **characterized in that** the thickness of the valve block (34) is gradually increased from the top to the bottom; one side of the valve block (34) is provided with an inclined surface II (40), and the corresponding other side of the valve block (34) completely covers the spray holes I (10); the inclined surface

II (40) is provided with a V-shaped guide groove (41); the V-shaped guide groove (41) is located at the center of the valve block (34); an included angle formed by a top edge of the V-shaped guide groove (41) and the inclined surface II (40) is 90 degrees; a bottom edge of the V-shaped guide groove (41) is arranged horizontally; a push plate (42) in flush with the bottom edge of the V-shaped guide groove (41) penetrates through one side of the rectangular cavity (33), and the spray holes I (10) are located at the corresponding other side of the rectangular cavity (33); the push plate (42) is hermetically and horizontally slidingly connected to one side of a rectangular hole; one end of the push plate (42) is located in the V-shaped guide groove (41), and the other end of the push plate (42) is located outside the rectangular cavity (33) and fixedly connected to the pull rod (39); a stop block (43) is arranged at the joint of the top edge of the V-shaped guide groove (41) and the inclined surface II (40); the stop block (43) is located in the V-shaped guide groove (41) and fixedly connected to a side wall of the V-shaped guide groove (41); and a stop groove (44) matched with the stop block (43) is formed at one end of the push plate (42) located at the V-shaped guide valve (41).

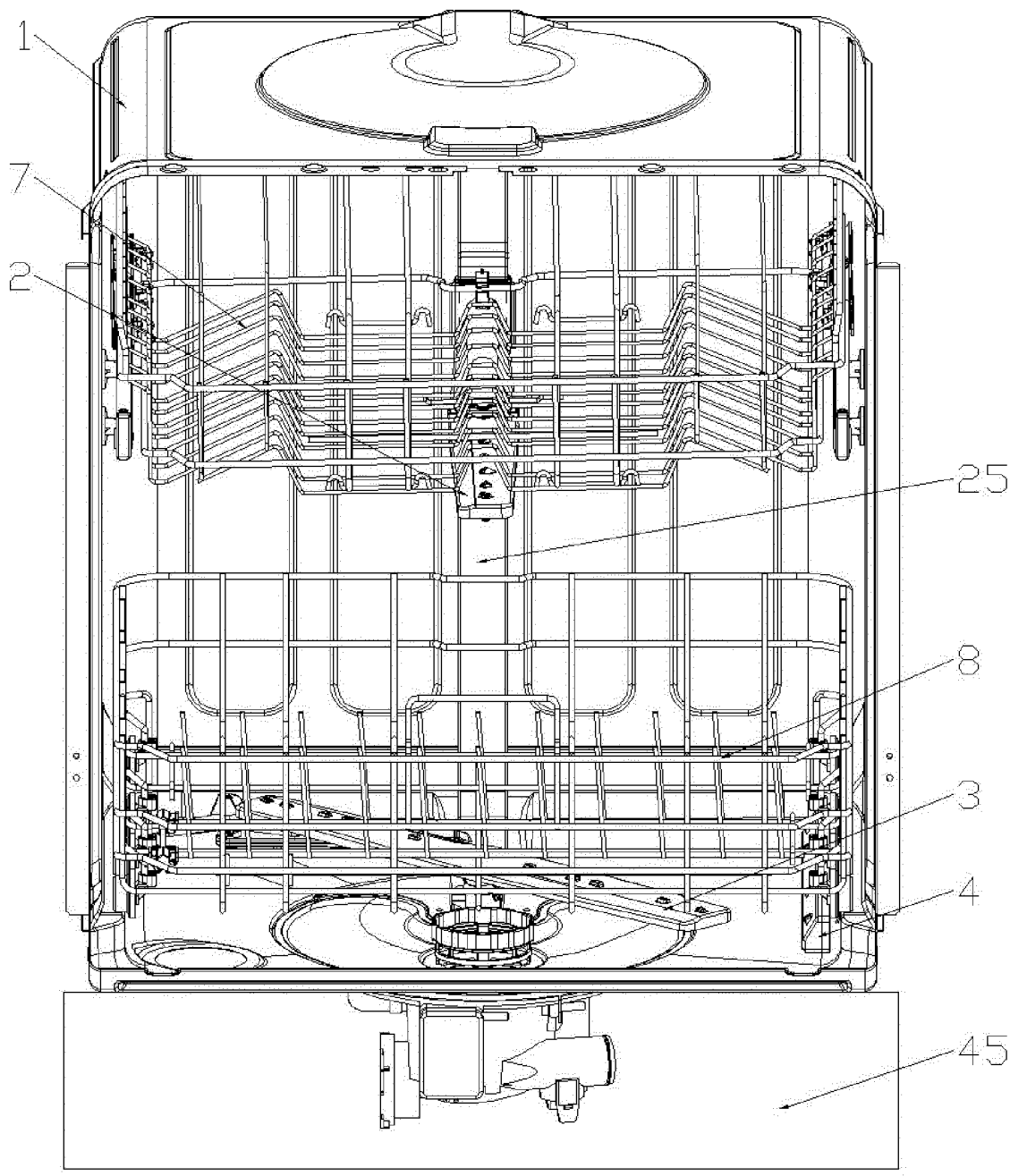


FIG. 1

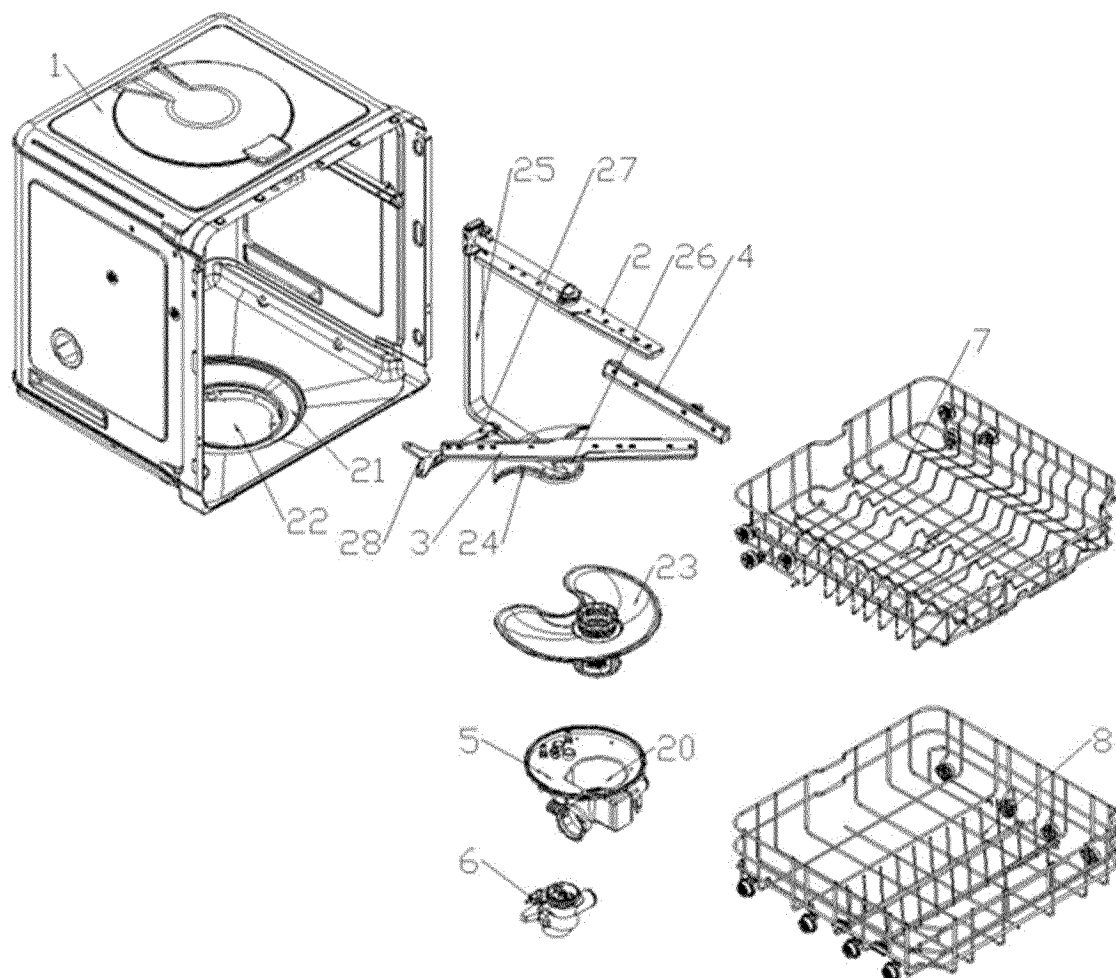


FIG. 2

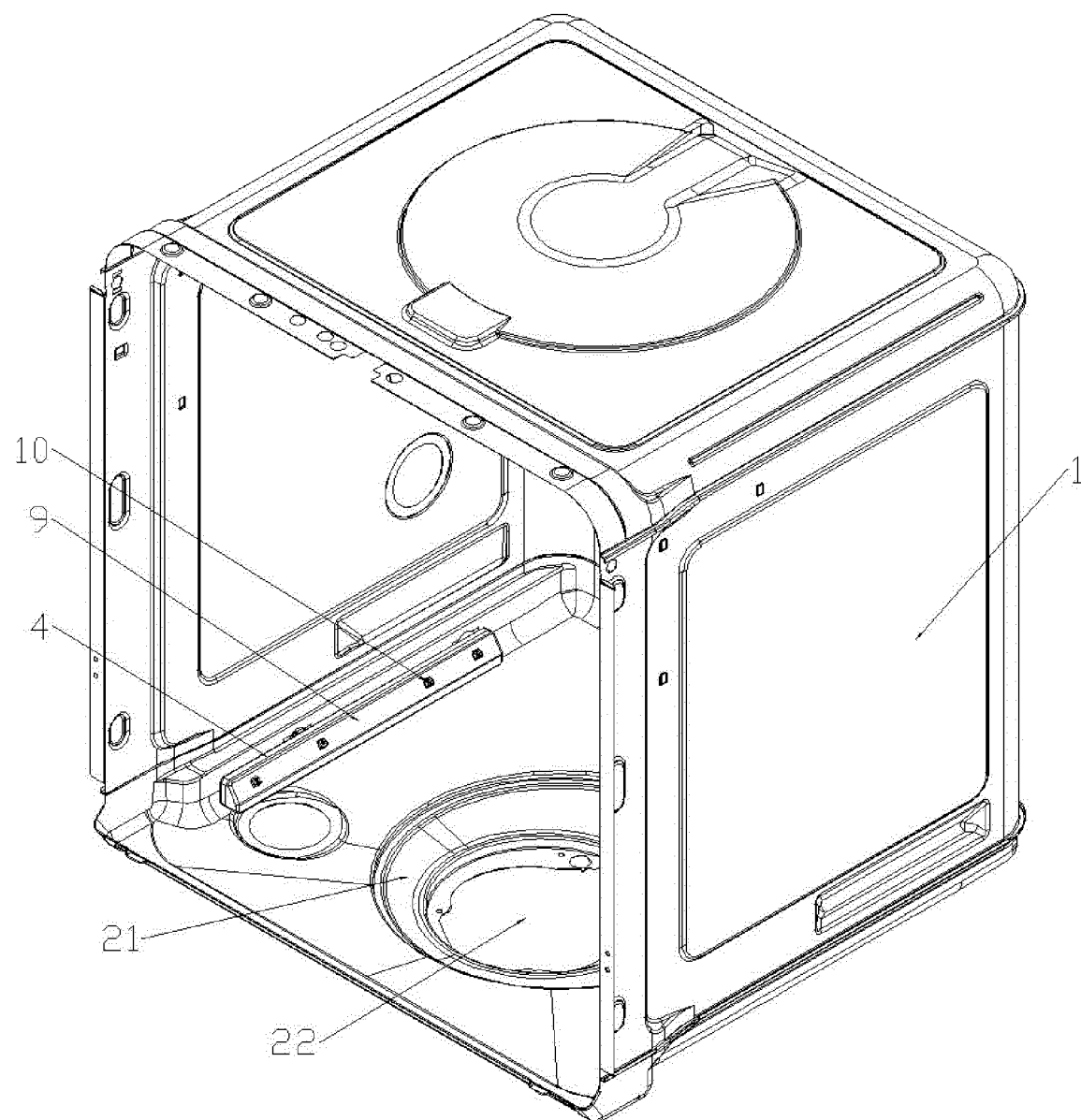


FIG. 3

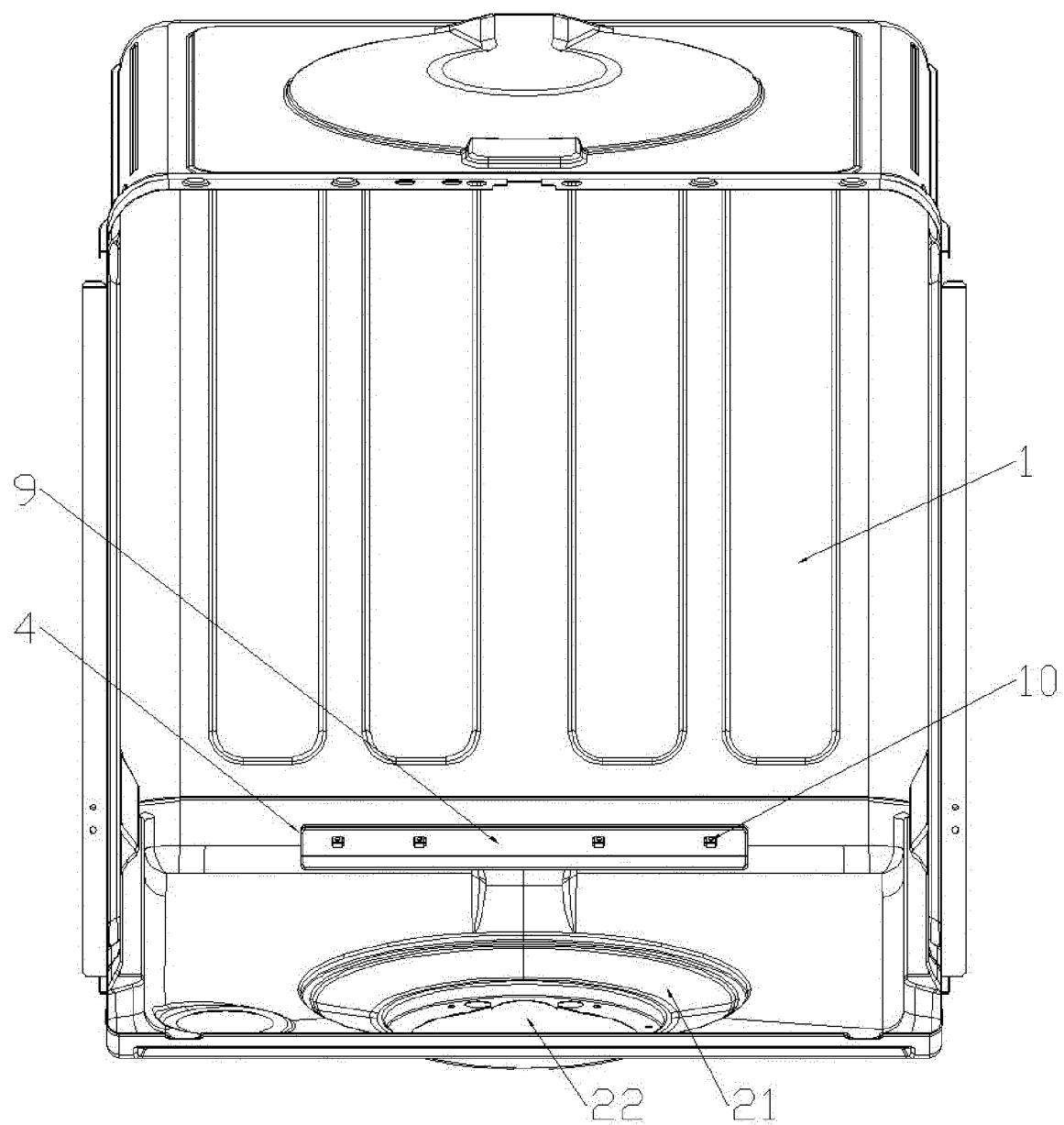


FIG. 4

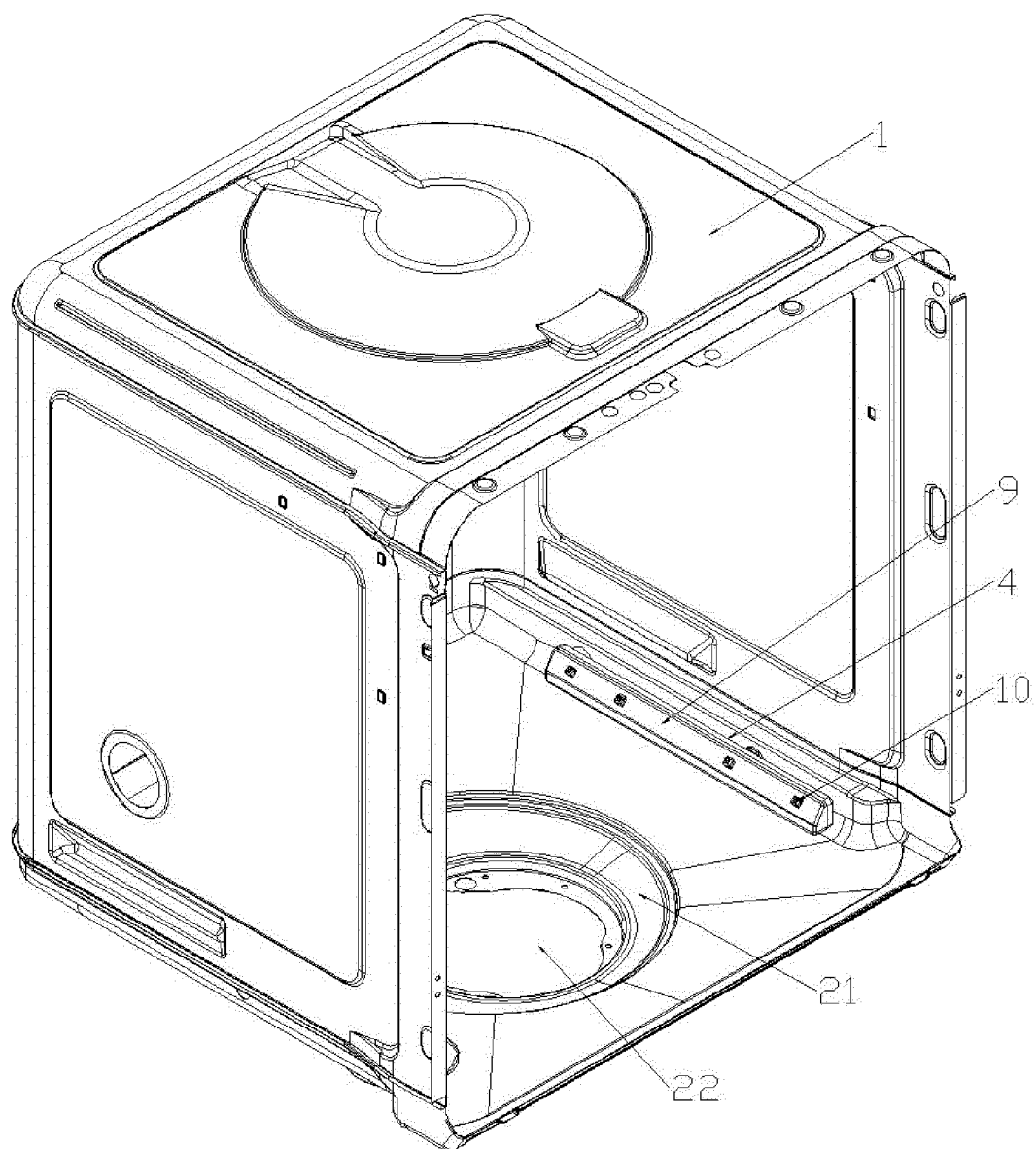


FIG. 5

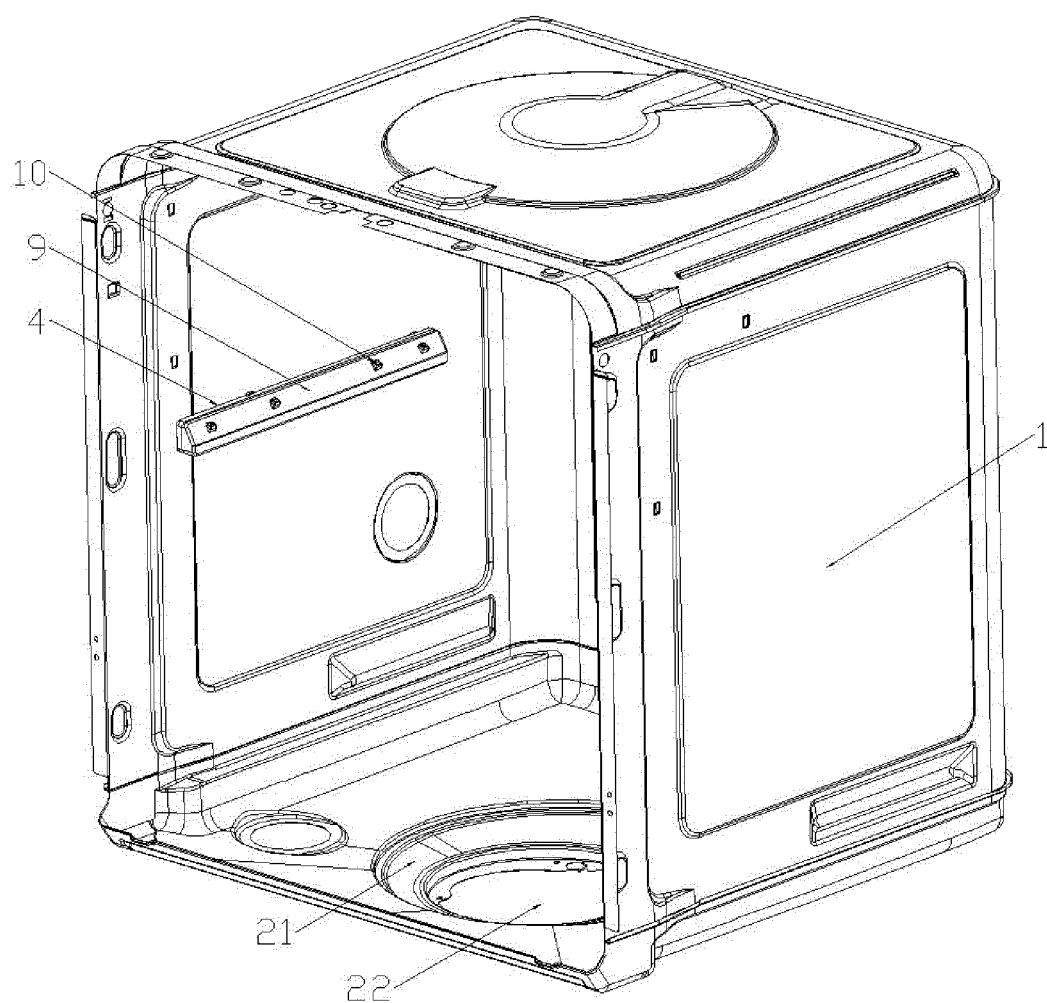


FIG. 6

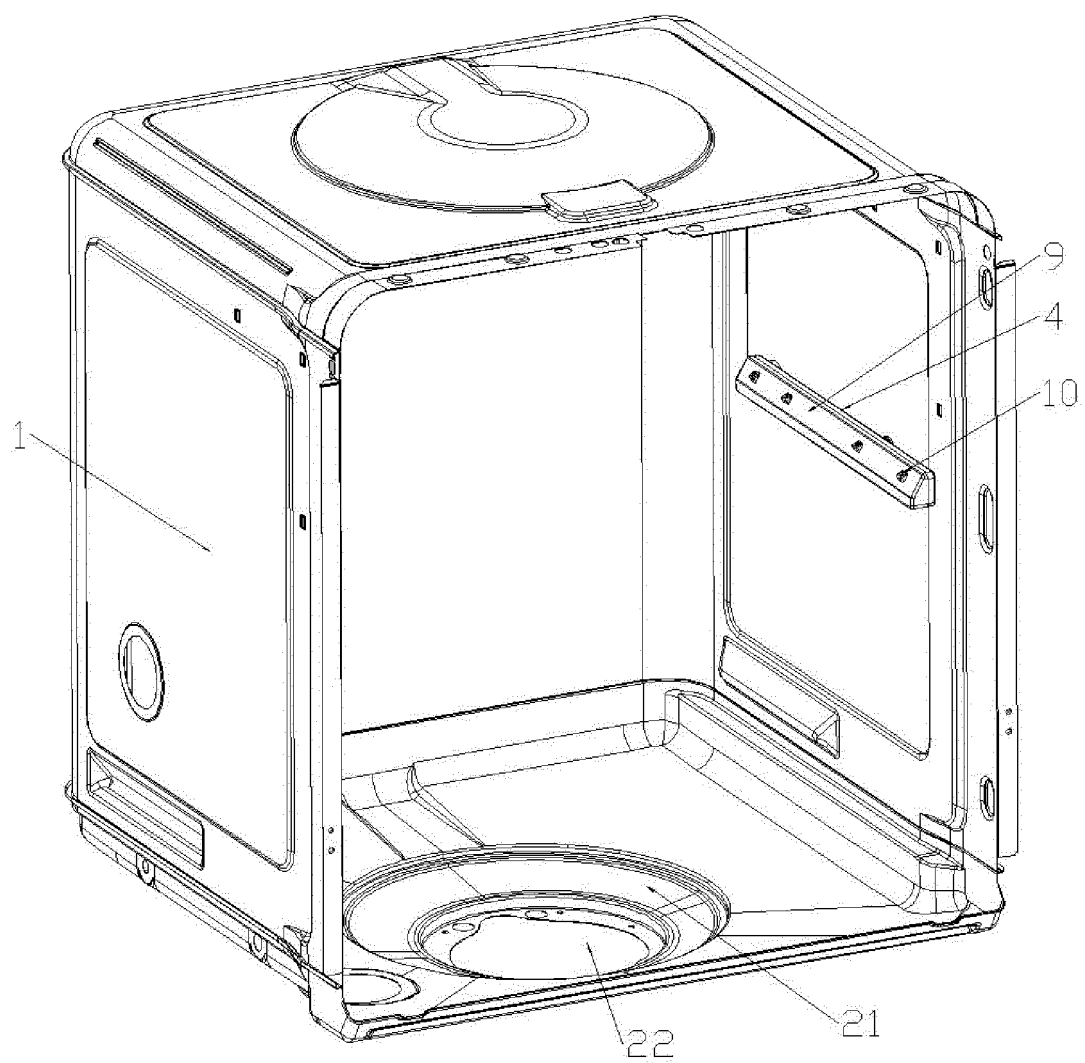


FIG. 7

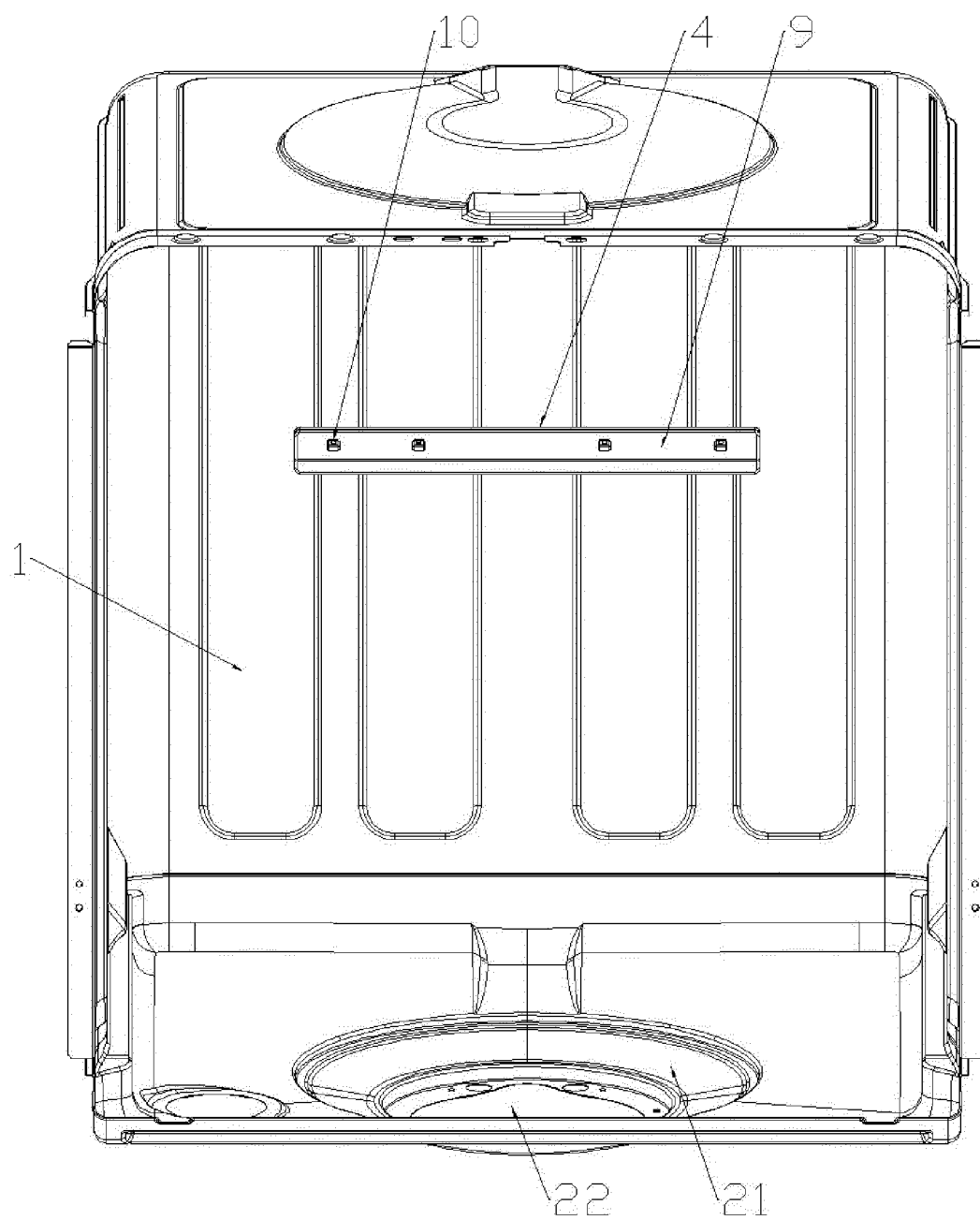


FIG. 8

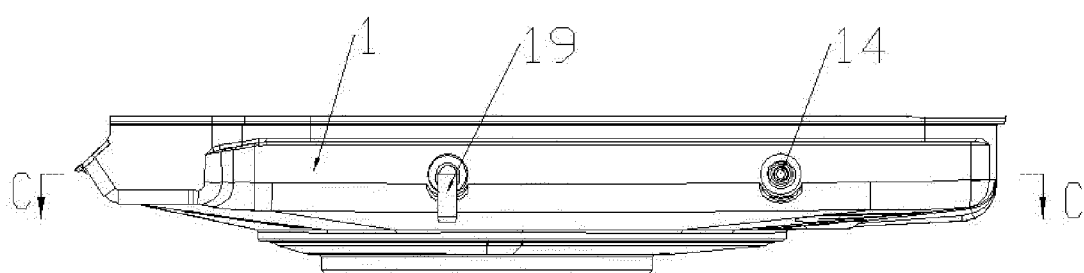


FIG. 9

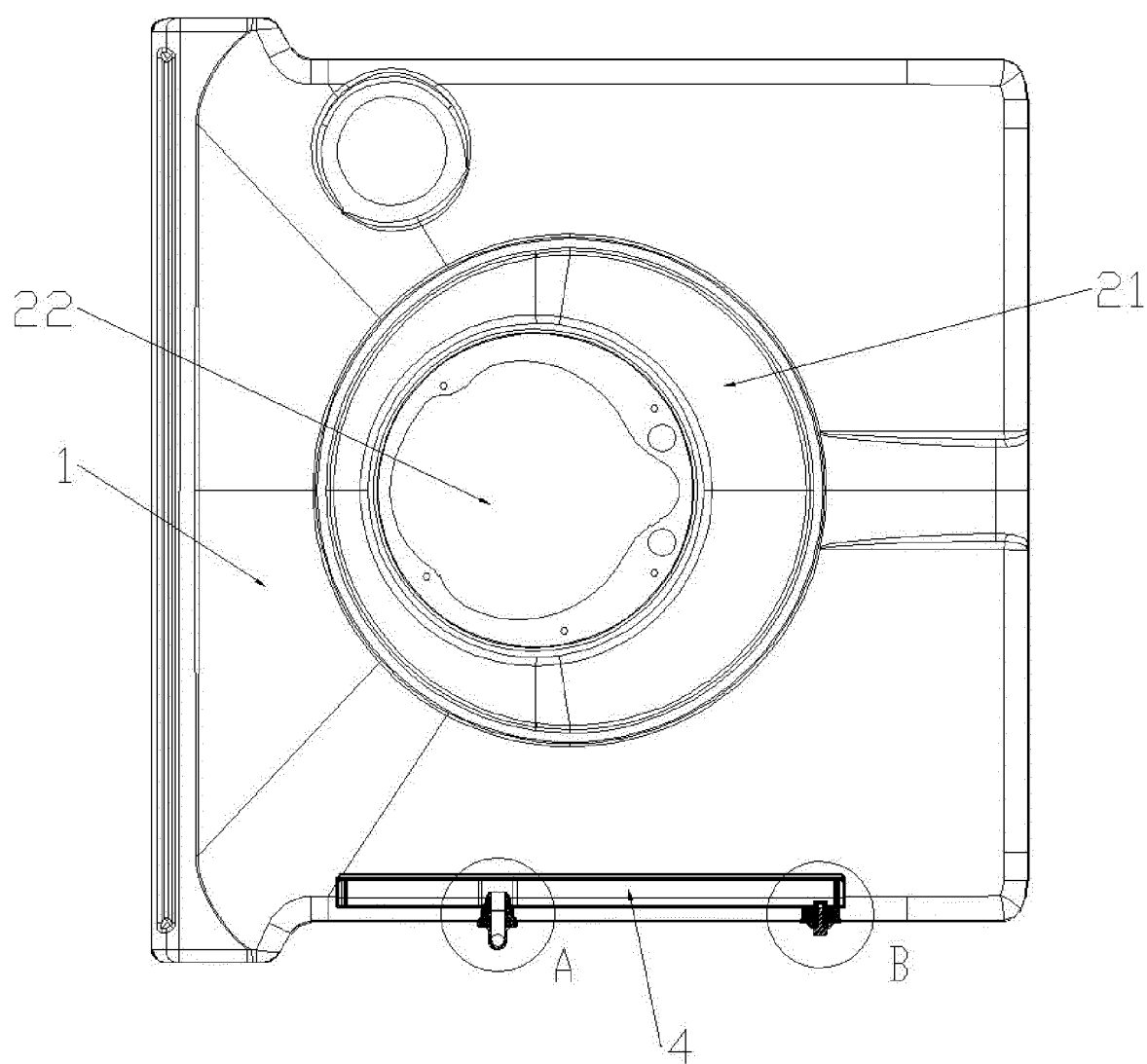


FIG. 10

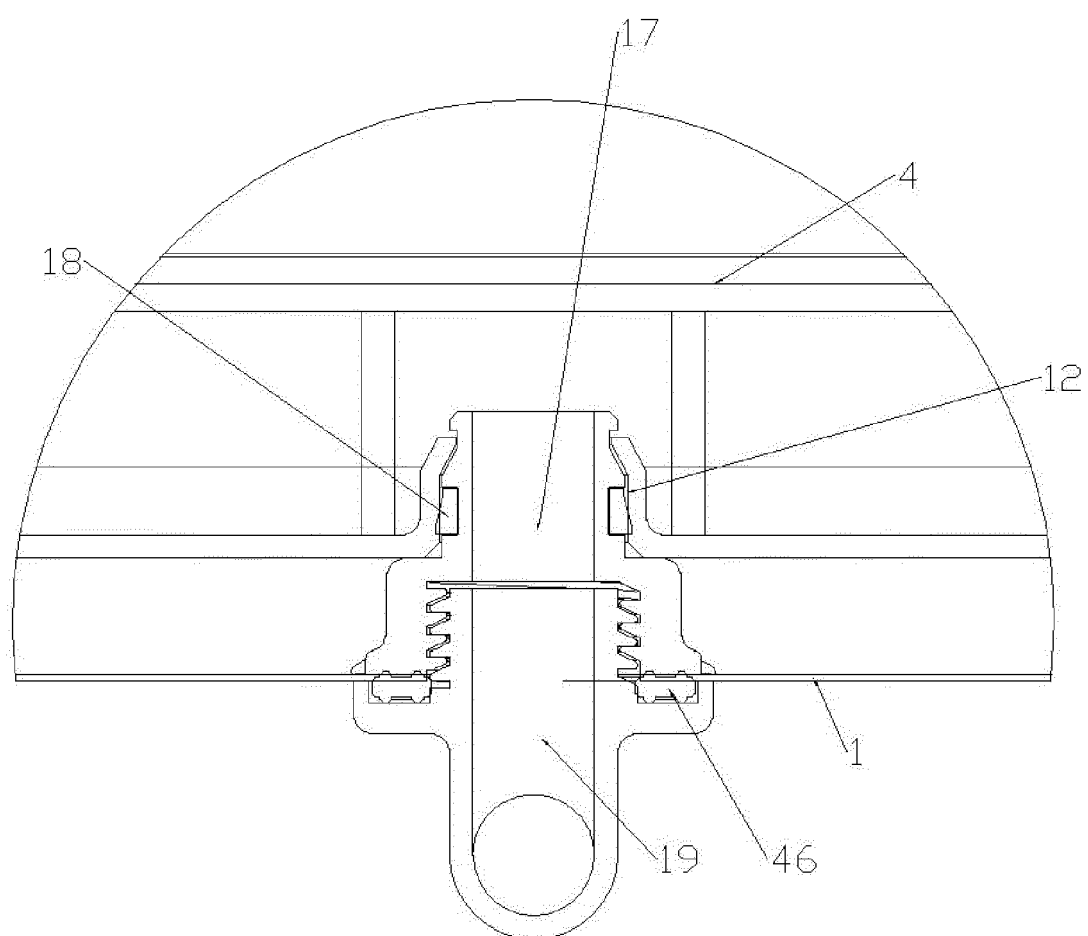


FIG. 11

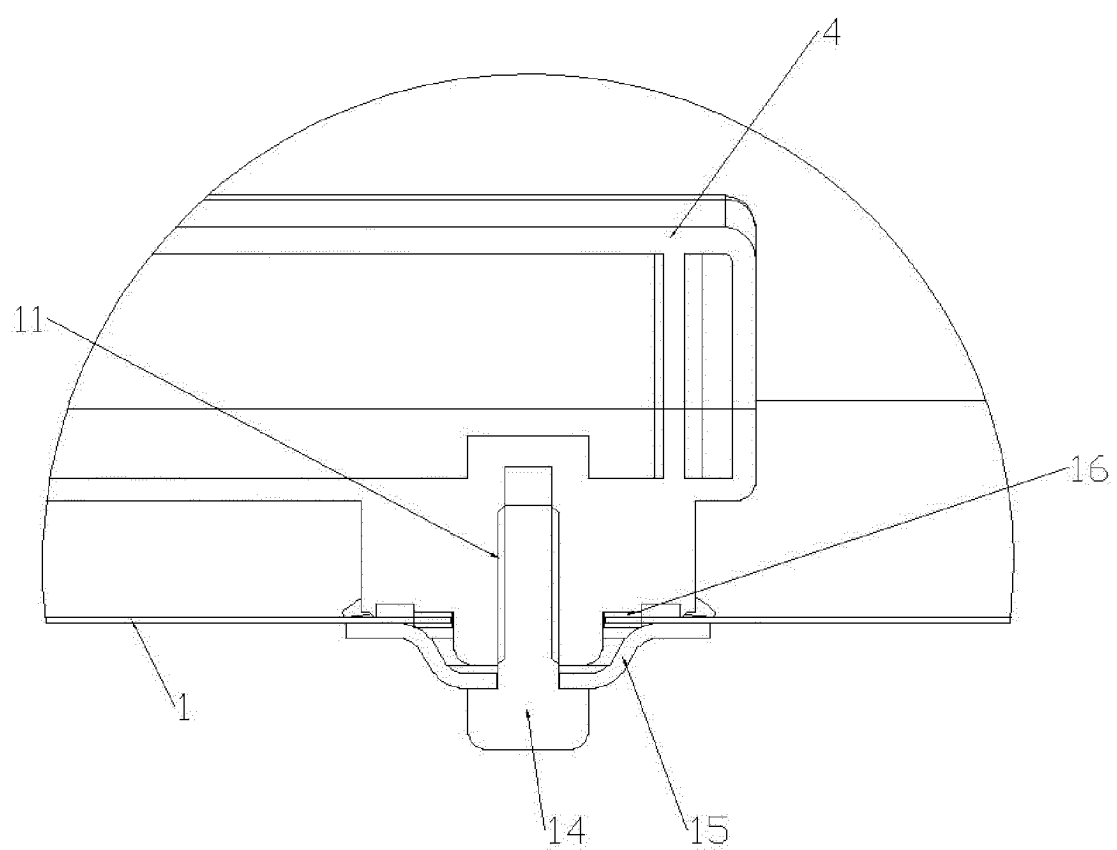


FIG. 12

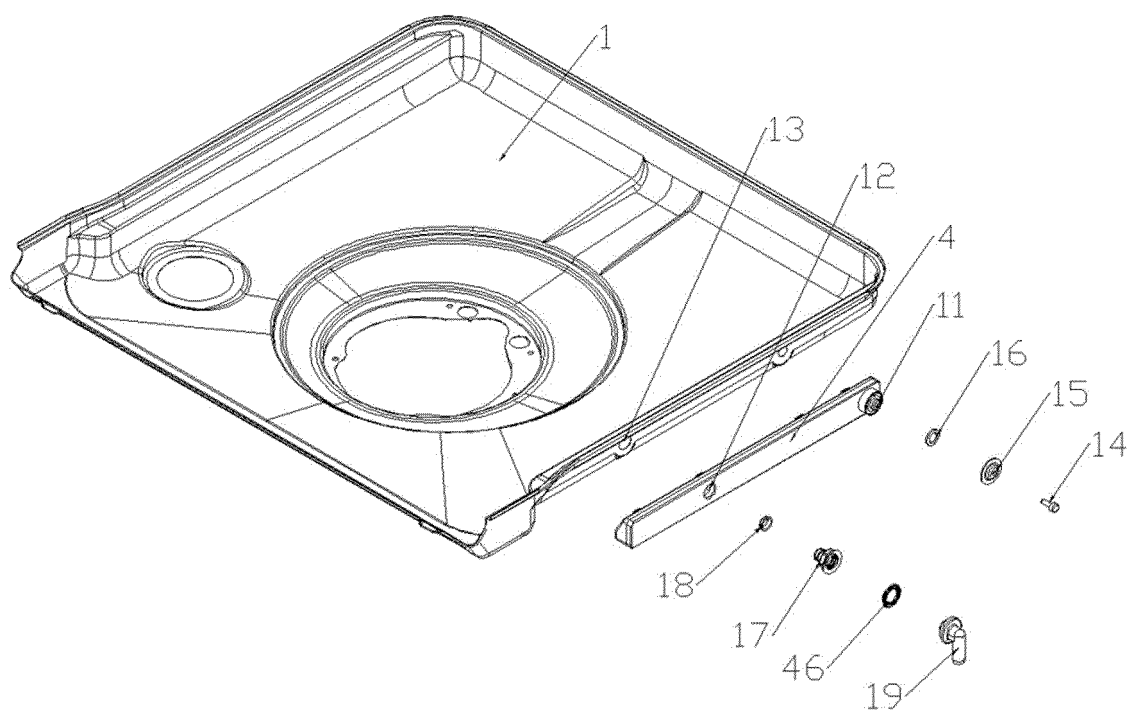


FIG. 13

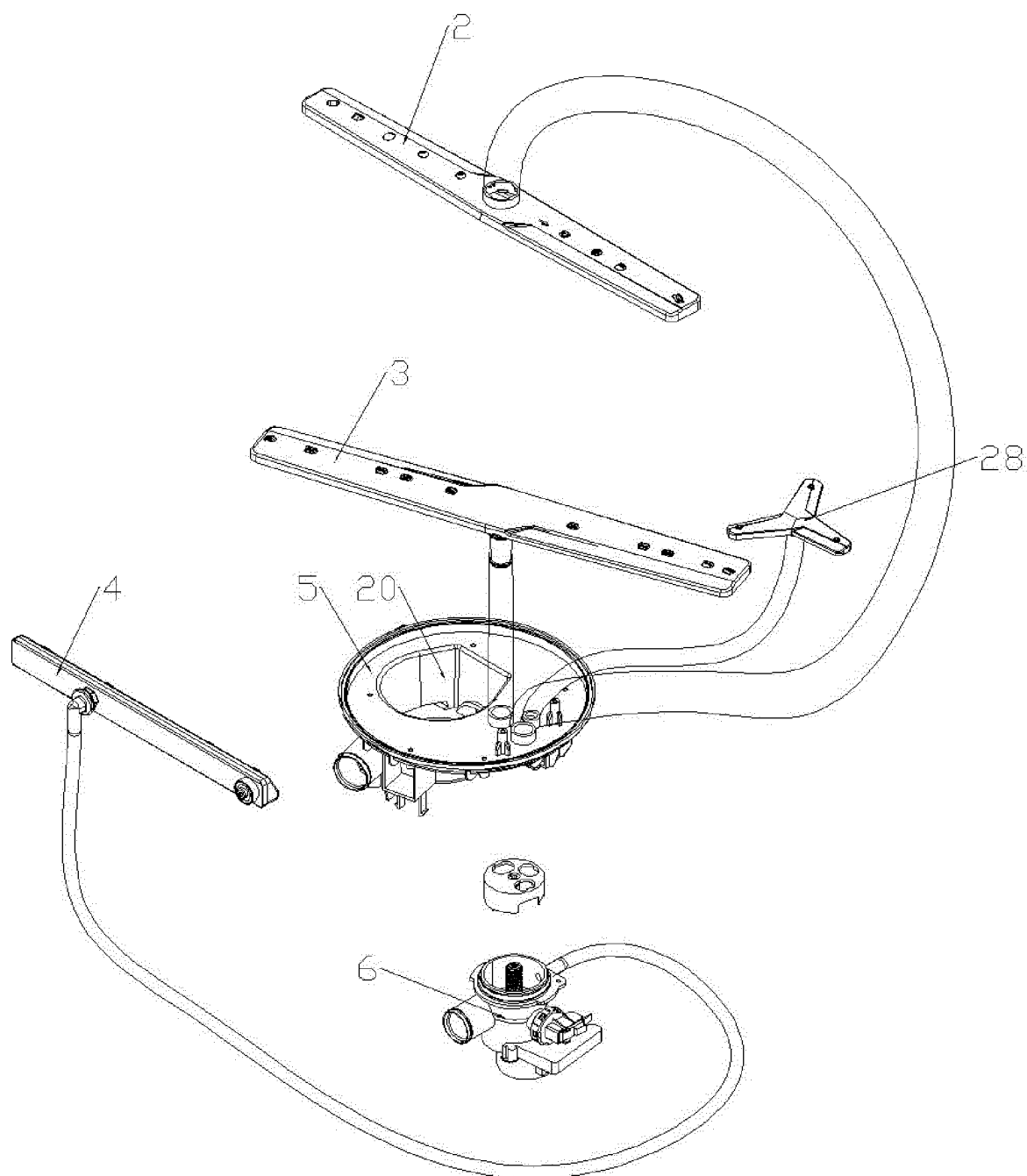


FIG. 14

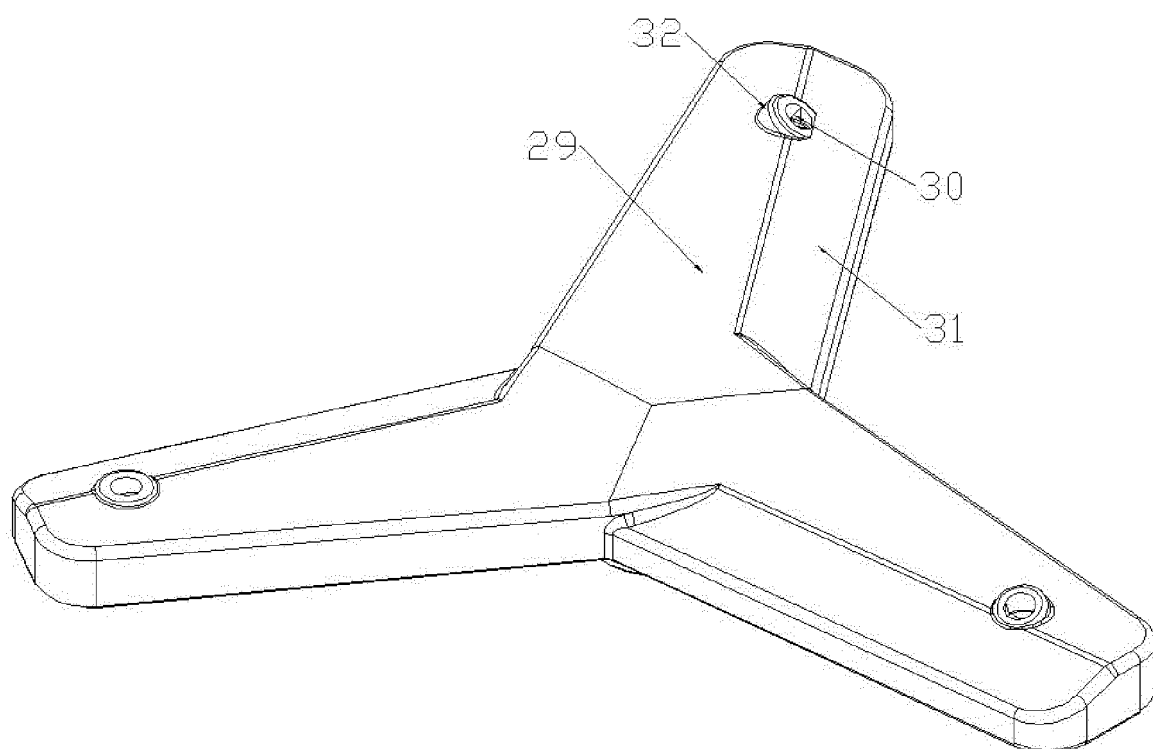


FIG. 15

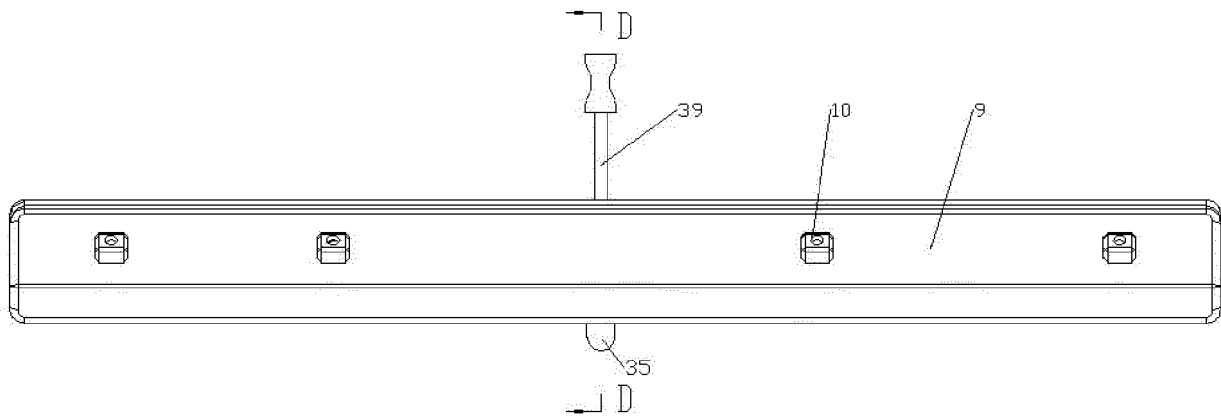


FIG. 16

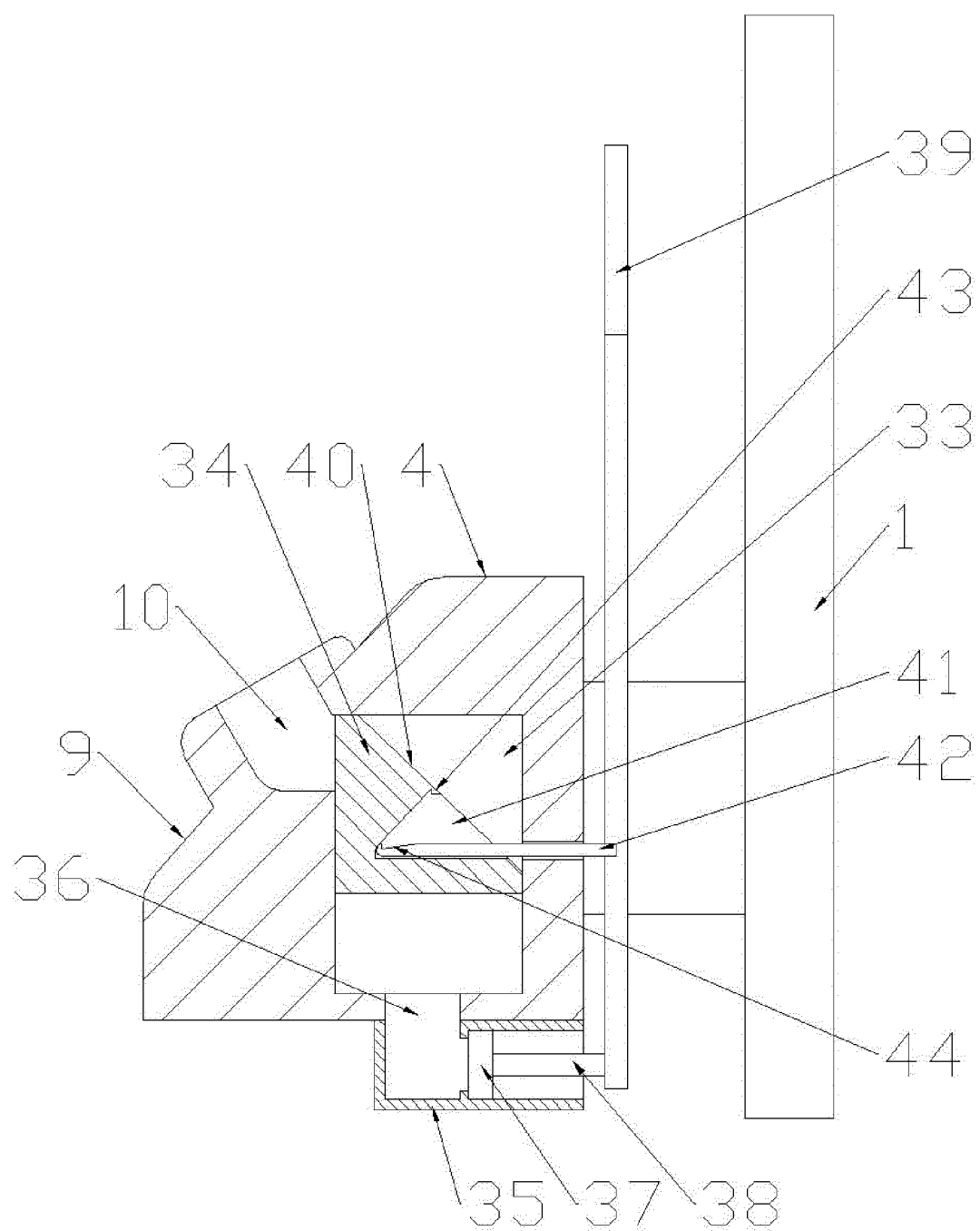


FIG. 17

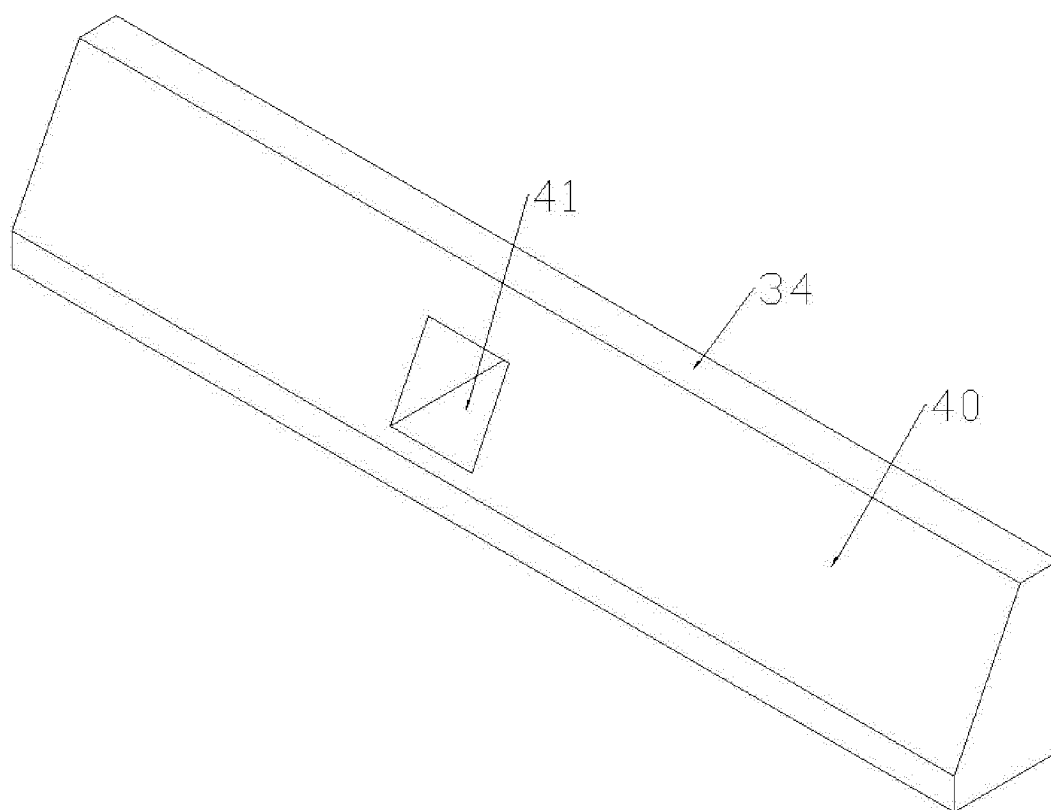


FIG. 18

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/107473

A. CLASSIFICATION OF SUBJECT MATTER

A47L15/16(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)

IPC: 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)

CNTXT, ENTXTC, CNKI, DWPI, VEN: 宁波德昌电机股份有限公司, 洗碗机, 洗杯机, 喷臂, 上, 下, 侧, 小喷臂, 独立, 分水阀, 水流量, 阀块, 充气, 气, 空气, 调节, dishwasher, washing, switch, valve, separate, single, spraying arm, spray+, side, air, adjust+, discharge

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	CN 218279559 U (NINGBO QINGCHU INTELLIGENT TECHNOLOGY CO., LTD.) 13 January 2023 (2023-01-13) description, paragraphs [0031]-[0046], and figures 1-12	1-8
Y	CN 213371828 U (HANGZHOU ROBAM APPLIANCES CO., LTD.) 08 June 2021 (2021-06-08) description, paragraphs [0027]-[0029], and figures 1-3	1-8
A	CN 105832266 A (FOSHAN SHUNDE MIDEA WASHING APPLIANCES MANUFACTURING CO., LTD. et al.) 10 August 2016 (2016-08-10) entire document	1-10
A	CN 109008882 A (WUHU GUANGYING INDUSTRIAL CO., LTD.) 18 December 2018 (2018-12-18) entire document	1-10
A	CN 109620089 A (QINGDAO HAIER DISHWASHER CO., LTD.) 16 April 2019 (2019-04-16) entire document	1-10

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

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Date of the actual completion of the international search

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Name and mailing address of the ISA/CN

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Authorized officer

Telephone No.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2023/107473

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	CN 210249743 U (GUANGDONG YIDE ELECTRIC CO., LTD.) 07 April 2020 (2020-04-07) entire document	1-10
A	CN 211381193 U (ZHUHAI GREE ELECTRIC APPLIANCES INC.) 01 September 2020 (2020-09-01) entire document	1-10
A	CN 215227376 U (ZHEJIANG VEZSIN ELECTRICAL CO., LTD.) 21 December 2021 (2021-12-21) entire document	1-10
A	JP 2009005925 A (HARMAN K.K.) 15 January 2009 (2009-01-15) entire document	1-10

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CN	218279559	U	13 January 2023	None			
CN	213371828	U	08 June 2021	None			
CN	105832266	A	10 August 2016	None			
CN	109008882	A	18 December 2018	None			
CN	109620089	A	16 April 2019	None			
CN	210249743	U	07 April 2020	None			
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CN	215227376	U	21 December 2021	None			
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REFERENCES CITED IN THE DESCRIPTION

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