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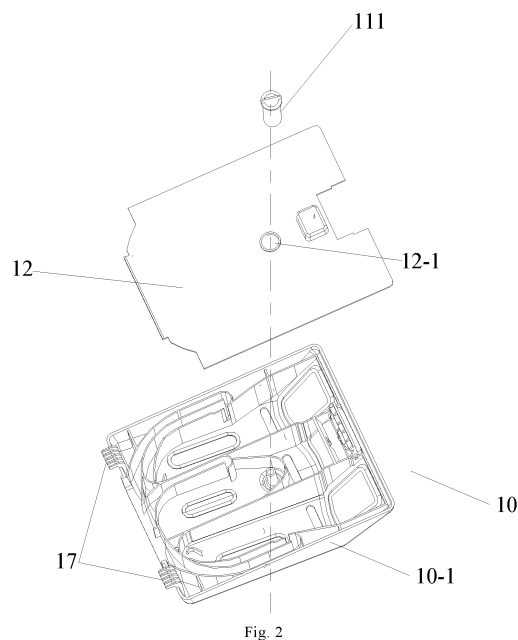
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(54) **DISPENSING DEVICE AND LAUNDRY TREATING DEVICE HAVING SAME**

(57) A dispensing device, including: a body having a dispensing port (11), a treating agent being dispensed to a preset position in the body via the dispensing port (11); a liquid feeding channel provided at the body and provided with a liquid inlet suitable for introducing a diluent, at least one of the liquid feeding channels being provided with a plurality of diluent outlets, and the liquid feeding channel being suitable for guiding the diluent to the plurality of diluent outlets to discharge the diluent, so as to mix the diluent with the treating agent to form a mixed liquid; and a liquid outlet (13) suitable for guiding the mixed liquid out of the body.



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Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] The present application is based on and claims priority to Chinese Patent Application Serial No. 201810963159.1, filed on August 22, 2018, the entire content of which is incorporated herein by reference.

FIELD

[0002] The present invention relates to a dispensing device, and particularly to a detergent dispensing device.

BACKGROUND

[0003] In a related art of dispensing a detergent of a top loading type drum washing machine, usually, a detergent box is mounted at a rear surface of a door, and water is fed into the detergent box by a water feeding spray nozzle and thus sprayed into the detergent box directly, thereby dispersing and dissolving the detergent placed in the detergent box, and then finishing the dispensation of the detergent by overturning a detergent storage portion.

[0004] There also exists a detergent dispensing device in a prior art. Specifically, the detergent box is mounted at a rear side of a worktable surface, a cover is provided above the detergent box to close a detergent dispensing port, and after the detergent is dispensed, the water is sprayed into the detergent box directly by a water feeding device behind the detergent, thereby dissolving and discharging the detergent in the detergent box.

[0005] However, in a solution disclosed in the related art, since the water is sprayed into a detergent storage area in the detergent box directly, and an unidirectional waterflow is unable to dissolve the detergent completely, the detergent is difficult to dissolve completely with a solution in the prior art, thereby being prone to have more residual detergents in the detergent box, which, on the one hand, does not facilitate cleanliness of a laundry, and on the other hand, wastes the detergent.

SUMMARY

[0006] The present invention seeks to solve at least one of the problems existing in a prior art. To this end, the present invention proposes a dispensing device.

[0007] Additional aspects and advantages of the present application will be given in part in the following descriptions or be learned from the practice of the embodiments of the present disclosure.

[0008] A dispensing device, including: a body dispensing port through which a treating agent being dispensed to a preset position in the body; a liquid feeding channel provided at the body and provided with a liquid inlet configured to introduce a diluent, at least one liquid feeding channel being provided with a plurality of diluent outlets,

and the liquid feeding channel being configured to guide the diluent to the plurality of diluent outlets to discharge the diluent, so as to mix the diluent with the treating agent to form a mixed liquid; a liquid outlet suitable for guiding the mixed liquid out of the body.

[0009] The preset position in the present invention refers to a preset area in the body for storing the treating agent, and after dispensed into the body, the treating agent moves to the preset area under the action of gravity, or the like.

[0010] The dispensing device according to an embodiment of the present invention is provided with the liquid feeding channel having the plurality of diluent outlets, such that the diluent may be discharged from the plurality of diluent outlets to flush the treating agent at a plurality of angles, thereby improving an effect of dissolving the treating agent and reducing the residual treating agent.

[0011] Preferably, the plurality of diluent outlets open towards the preset position, such that the diluent flows towards the preset position after discharged from the plurality of diluent outlets. As such, the treating agent may be flushed directly by the diluent discharged from the plurality of diluent outlets, thereby further improving the effect of dissolving the treating agent.

[0012] Preferably, the dispensing port is provided at one end of the body, the liquid inlet is provided at the other end opposite to the dispensing port, and the preset position is adjacent to the liquid inlet.

[0013] Preferably, the liquid feeding channel includes a first flow limiting wall and a second flow limiting wall, the first flow limiting wall includes a left side wall and a right side wall connected to each other by an arc wall, and the second flow limiting wall is inserted between the left side wall and the right side wall, thereby forming the liquid feeding channel into a shape of track. As such, the track-shaped channel reduces a flow resistance and an energy loss of the diluent.

[0014] Preferably, the diluent outlet includes a first diluent outlet, a second diluent outlet and a third diluent outlet; the left side wall has a first arc segment spaced apart from the second flow limiting wall to form the liquid inlet, and the left side wall further includes a first linear segment extending from the first arc segment to the dispensing port and connected to one end of the arc wall; the right side wall includes a second linear segment connected to the other end of the arc wall, and a notch is defined adjacent to a joint between the arc wall and the second linear segment and formed into the first diluent outlet. As such, the arrangement of the first arc segment enables the diluent to be introduced into the liquid feeding channel without the resistance, and the diluent may move towards the dispensing port rapidly under guidance of the first linear segment after introduced, be reversed under the action of the arc wall, and then be sprayed out of the first diluent outlet, thereby flushing the treating agent, which facilitates rapid dissolution of the treating agent.

[0015] Preferably, the liquid feeding channel further includes a third flow limiting wall; the right side wall further

includes a second arc segment extending from the second linear segment to the liquid inlet, the third flow limiting wall is spaced apart from the second arc segment to form the second diluent outlet, and the third diluent outlet is defined between the third flow limiting wall and the second flow limiting wall; and the first diluent outlet is more adjacent to the dispensing port than the second diluent outlet and/or the third diluent outlet, and the preset position is located between the first diluent outlet and the second diluent outlet and/or the third diluent outlet. That is, at least a part of the diluent outlet is located at a side of the preset position adjacent to the dispensing port, and at least a part of the diluent outlet is located at a side of the preset position adjacent to the liquid inlet; as such, the diluent is flushed out of the second and third diluent outlets to disperse the treating agent, the treating agent is further mixed with the diluent under the action of the diluent guided out of the first diluent outlet, and thus the treating agent is dissolved completely under the action of the water in three directions, which undoubtedly increases an efficiency of dissolving the treating agent greatly.

[0016] Preferably, at least a part of the third flow limiting wall is formed into a shape of an arc, the third flow limiting wall extends towards the right side wall, a fork portion is formed at an end of the second flow limiting wall adjacent to the liquid inlet and has a first fork wall and a second fork wall, the first fork wall is adjacent to the third flow limiting wall and spaced apart from the third flow limiting wall to define the third diluent outlet, the first fork wall is formed into a shape of an arc and extends away from the right side wall, and the second fork wall is adjacent to the first arc segment and spaced apart from the first arc segment to define the liquid inlet. As such, the arrangement of the fork portion saves a material of the liquid feeding channel, and meanwhile enables the liquid inlet and the second and third diluent outlets to be formed more easily and conveniently.

[0017] Preferably, the body has a bottom wall and a box-shaped structure enclosed by a side wall projecting upwards from the bottom wall, the liquid feeding channel is provided in the box-shaped structure; and an area of the box-shaped structure adjacent to the liquid inlet is formed as the preset position.

[0018] Preferably, the liquid outlet is provided adjacent to the dispensing port and formed into an open slot provided at the bottom wall. As such, the mixed liquid adjacent to the liquid inlet may flow to the liquid outlet adjacent to the dispensing port and may be discharged into a machine body, which prolongs a flow path of the mixed liquid, thereby prolonging a mixing time of the treating agent and the diluent and further improving the effect of dissolving the treating agent undoubtedly.

[0019] Preferably, the dispensing device further has a transparent observation window configured as an open hole provided at the bottom wall and closed by a transparent material; as such, the amount of dispensed treating agent may be observed outside from the transparent

observation window, thereby enabling a user to control the amount of dispensed treating agent conveniently.

[0020] Preferably, the dispensing device further includes a cover covering over the body and connected to the side wall.

[0021] Preferably, the first flow limiting wall, the second flow limiting wall, and the third flow limiting wall are formed by the bottom wall projecting upwards, and at least parts of the first flow limiting wall and the second flow limiting wall are connected to the cover, such that at least a part of the liquid feeding channel is formed into a closed channel.

[0022] Preferably, a portion of the second arc segment of the first flow limiting wall located adjacent to the liquid inlet has a height reducing gradually towards the liquid inlet, such that an overflow space is defined between the second arc segment and the cover.

[0023] Preferably, the third flow limiting wall is formed by a bottom of the body projecting upwards, and is not connected to the cover, such that an overflow is defined space between the third flow limiting wall and the cover. As such, the diluent may overflow from the second arc segment to better dissolve the treating agent deposited at a bottom of the second arc segment, such as washing powder, which improves the effect of dissolving the treating agent undoubtedly; for the same reason, the overflow space is also formed between the third flow limiting wall and the cover, thereby better dissolving the washing powder accumulated at the third flow limiting wall.

[0024] Preferably, the dispensing device further includes a partition wall formed by the bottom wall projecting upwards and connected to the cover, so as to partition the box-shaped structure into a plurality of independent cavities, wherein the plurality of liquid feeding channels are provided in the plurality of cavities respectively. As such, the plurality of independent cavities may be configured to dispense different treating agents, such as the washing powder, a liquid detergent, a softener, or the like.

[0025] The present invention further provides a laundry treating device, including a machine body and the above-mentioned dispensing device.

BRIEF DESCRIPTION OF THE DRAWINGS

[0026] The above-mentioned and/or additional aspects and advantages of the present invention will be readily appreciated from the following descriptions of the embodiments made with reference to the drawings, in which

Fig. 1 is a schematic structural diagram of a laundry treating device according to the present invention;
Fig. 2 is a schematic structural diagram of a detergent box according to the present invention;
Fig. 3 is a top view of a body of the detergent box according to the present invention;
Fig. 4 is a schematic structural diagram of a liquid feeding channel according to the present invention;

Fig. 5 is a perspective view of the body of the detergent box according to the present invention; and Fig. 6 is an enlarged view of portion A of Fig. 5.

REFERENCE NUMERALS

[0027] 1. detergent box; 2. door seal; 3. water feeding spray nozzle; 4. machine body; 5. door; 6. opening; 10. body of detergent box; 10-1. side wall; 11. dispensing port; 11-1. first dispensing port; 11-2. second dispensing port; 11-3. third dispensing port; 12. cover; 12-1. through hole; 13. liquid outlet; 13-1. first liquid outlet; 13-2. second liquid outlet; 13-3. third liquid outlet; 14. third cavity; 14-1. fourth diluent outlet; 14-2. fourth flow limiting wall; 14-3. fifth flow limiting wall; 14-4. collection groove; 14-5. collection wall; 14-5-1. left collection wall; 14-5-2. right collection wall; 14-5-3. arc connection wall; 14-6. outflow column; 14-7. second liquid inlet; 14-8. third arc segment; 14-9. collection area; 15-1. first window; 15-2. second window; 16. first cavity; 16-1. first diluent outlet; 16-2. second diluent outlet; 16-3. third diluent outlet; 16-4. first flow limiting wall; 16-40. left side wall; 16-41. right side wall; 16-4-1. first arc segment; 16-4-2. first linear segment; 16-4-3. semicircular wall; 16-4-4. second linear segment; 16-4-5. second arc segment; 16-5. second flow limiting wall; 16-5-1. first fork wall; 16-5-2. second fork wall; 16-6. third flow limiting wall; 16-7. first liquid inlet; 17. connecting end; 18. second cavity; 19-1. first partition wall; 19-2. second partition wall; 111. siphon cap.

DETAILED DESCRIPTION

[0028] Reference will be made in detail to embodiments of the present application, and the examples of the embodiments are illustrated in the drawings, wherein the same or similar elements and the elements having same or similar functions are denoted by like reference numerals throughout the descriptions. The embodiments described herein with reference to drawings are illustrative, and merely used to explain the present application. The embodiments shall not be construed to limit the present application.

[0029] In the description of the present application, it is appreciated that terms such as "center", "longitudinal", "transverse", "length", "width", "thickness", "upper", "lower", "front", "rear", "left", "right", "vertical", "horizontal", "top", "bottom", "inner", "outer", "clockwise", "anticlockwise", "axial", "radial", and "circumferential" should be construed to refer to the orientation as then described or as shown in the drawings under discussion. These relative terms are for convenience of description and do not require that the present application be constructed or operated in a particular orientation, thus cannot be construed to limit the present application. Furthermore, the feature defined with "first" and "second" may include one or more of this feature explicitly or implicitly. In the description of the present invention, the term "a plurality of" means two or more unless otherwise stated.

[0030] In the description of the present invention, it should be noted that unless specified or limited otherwise, the terms "mounted", "connected", and "coupled" and the like are used broadly, and may be, for example, fixed connections, detachable connections, or integral connections; may also be mechanical connections or electrical connections; may also be direct connections or indirect connections via intervening structures; may also be inner communications of two elements. The above terms can be appreciated by those skilled in the art according to specific situations.

[0031] The present invention will be described below in detail taking a top loading type drum washing machine with a detergent box as a dispensing device and water as a diluent as an example. It should be noted that the present invention is not only applied to the top loading type drum washing machine, but also to other household appliances, such as other types of washing machines, a dish washing machine, or the like.

[0032] Referring to Fig. 1, the top loading type drum washing machine includes: a machine body 4 provided therein with a drum (not shown) and having an opening 6 for loading a laundry provided at a top, a door seal 2 being assembled at an inner side of the opening 6 for cooperating with a door 5 provided above the opening to close the opening 6, thereby ensuring that when the laundry is washed, no water in the machine body will be spilled out of the opening 6; a dispensing device, i.e., a detergent box 1, provided at a lower side of the door 5 and facilitating a user to dispense a detergent. Specifically, the detergent box 1 is mounted at a lower side surface of the door 5 by means of a mounting end 17 provided at a lower end of the detergent box 1, and thus may be pulled out as the door 5 is opened; in this state, the user may dispense the detergent into the detergent box 1; when the door 5 is closed, the detergent box 1 is lowered into the opening 6, water is introduced into the detergent box 1 by a water feeding device, i.e., a water feeding spray nozzle 3, provided at a rear portion of the detergent box 1, thereby dispersing and mixing the detergent in the detergent box 1 and dispensing the detergent into a rotary drum in the machine body 4.

[0033] Referring to Figs. 2 to 5, a specific structure of the dispensing device, i.e., the detergent box 1, will be described below in detail. As shown in Fig. 2, the detergent box 1 includes a body (referred to as a box body 10 below) and a cover 12 covering over the box body 10, wherein the box body 10 is enclosed by a bottom wall and a side wall 10-1 projecting upwards from a bottom, and the cover 12 is configured to close the box body 10 to ensure that the water flows in the detergent box 1; a through hole 12-1 is provided adjacent to a middle portion of the cover 12 and configured to mount a siphon member which is a siphon cap 111 in the present embodiment, and a mounting structure of the siphon member 111 will be described below.

[0034] Referring to Fig. 3, the detergent box 1 includes a dispensing port 11 (as shown in Figs. 3 to 5, an end

towards the dispensing port 11 is considered as front, and an end opposite to the dispensing port 11 as rear), and a detergent cavity is provided at a rear portion of the dispensing port 11. Specifically, in the present embodiment, a space in the box body of the detergent box 1 is divided into three cavities by two partition walls extending back and forth, i.e., a first partition wall 19-1 and a second partition wall 19-2, and the first and second partition walls 19-1, 19-2 are formed by the bottom wall of the detergent box projecting upwards, and connected to the cover 12 to form the three closed cavities. That is, in the present embodiment, three cavities are provided and configured as a first cavity 16 and a second cavity 14 provided at two sides and a third cavity 18 provided therebetween. In the present embodiment, as shown in Fig. 3, a side where the first cavity 16 is located is taken as left, a side where the second cavity 14 is located is taken as right, and a liquid feeding channel is provided in the cavity. In the present embodiment, three liquid feeding channels are provided, configured as a first liquid feeding channel, a second liquid feeding channel and a third liquid feeding channel respectively, and are correspondingly provided in the first, second and third cavities 16, 14, 18 respectively, so as to enable the water to flush conveniently the treating agent stored therein temporarily.

[0035] Firstly, a structure of the first cavity 16 will be described below in detail. A first dispensing port 11-1 is provided at a top of a front end of the first cavity 16. Specifically, the treating agent, such as washing powder, may be dispensed into the first cavity 16 via the first dispensing port 11-1. A first liquid inlet 16-7 is provided at a rear end portion of the first cavity 16, the water is fed into the first cavity 16 via the first liquid inlet 16-7, and the first liquid feeding channel is provided at a front portion of the first liquid inlet 16-7. Specifically, the first liquid feeding channel includes a first flow limiting wall 16-4, a second flow limiting wall 16-5 and a third flow limiting wall 16-6. That is, the first liquid feeding channel is formed of the first flow limiting wall, the second flow limiting wall, and the third flow limiting wall 16-4, 16-5, 16-6. Specifically, the first flow limiting wall 16-4 includes a left side wall 16-40 and a right side wall 16-41 which are connected by an arc wall. In the present embodiment, the arc wall is configured as a semicircular wall 16-4-3, the second flow limiting wall 16-5 is inserted into a space enclosed by the left side wall and the right side wall 16-40, 16-41, so as to form substantially the whole first liquid feeding channel into a shape of track. Specifically, a first arc segment 16-4-1 is provided at a rear portion of the first flow limiting wall 16-4, i.e., a rear portion of the left side wall, a gap between the first arc segment 16-4-1 and the second flow limiting wall 16-5 is formed as the first liquid inlet 16-7, and the first arc segment 16-4-1 extends forwards and leftwards, so as to guide the water into the first liquid feeding channel without a resistance. The first flow limiting wall 16-4 further includes a first linear segment 16-4-2 extending forwards from the first arc segment 16-4-1 to guide the water forwards. The semicircular

lar wall 16-4-3 is connected to a tail end of a front side of the first linear segment 16-4-2, so as to reverse the water conveniently under guidance of the semicircular wall 16-4-3. The first liquid feeding channel further includes a second linear segment 16-4-4 provided substantially under the semicircular wall 16-4-3 parallel to the first linear segment 16-4-2 substantially, and a gap is defined between the second linear segment 16-4-4 and a tail end of a right side of the semicircular wall 16-4-3, such that a first diluent outlet 16-1 is formed between a second arc segment 16-4-4 and the second linear segment 16-4-4 and enables the water to be inclined backwards and rightwards and discharged out of the first diluent outlet 16-1. The second arc segment 16-4-5 is connected to a lower tail end of the second linear segment 16-4-4 and extends rightwards and backwards, such that the second arc segment 16-4-5 is parallel to the first arc segment 16-4-1 substantially. The third flow limiting wall 16-6 is provided at a right side of the second arc segment 16-4-5 substantially and not connected to the second arc segment 16-4-5, such that a second diluent outlet 16-2 is defined between the second arc segment 16-4-5 and the third flow limiting wall 16-6, at least a part of the third flow limiting wall 16-6 is formed into a shape of arc, and the third flow limiting wall extends towards the second arc segment 16-4-5 of the right side wall. Specifically, a lower end of the third flow limiting wall 16-6 is formed into a shape of arc, so as to smoothly introduce the water. An upper end of the third flow limiting wall 16-6 is formed into a straight line and extends forwards and leftwards, i.e., towards the second arc segment 16-4-5, such that the water is discharged leftwards and forwards via the second diluent outlet 16-2. A fork portion is provided at a portion of the second flow limiting wall 16-5 located behind the third flow limiting wall 16-6, and includes a first fork wall 16-5-2 formed into a shape of arc, a third diluent outlet 16-3 is defined between the first fork wall 16-5-1 and the third flow limiting wall 16-6, the first fork wall 16-5-1 extends rightwards relative to the third flow limiting wall 16-6 and is connected to the first partition wall 19-1, such that a rear portion of the first cavity has a closed structure. Due to the arrangement of the third flow limiting wall 16-6, the water is discharged forwards via the second and third diluent outlets 16-2, 16-3. Since the treating agent, such as the washing powder, is located at the preset position, i.e., adjacent to a lower portion of the first cavity 16, under gravity after dispensed, in the present embodiment, the water is discharged via the second and third diluent outlets 16-2, 16-3 to disperse the treating agent, such as the washing powder, and the treating agent, such as the washing powder, is further mixed with water under the action of the water guided out of the first diluent outlet 16-1, thereby dissolving the washing powder completely under the action of the water in three directions. A first liquid outlet 13-1 is provided between a front end of the first liquid feeding channel and the first dispensing port 11-1, and a detergent mixed liquid formed by adequately mixing

the water in the three directions overflows via the first liquid outlet 13-1 and flows into a drum in the machine body 4, for washing the laundry. Particularly, since the first liquid outlet 13-1 is provided in front of the liquid feeding channel, the arrangement of the first diluent outlet 16-1 may further avoid a washing powder mixed liquid which is not mixed adequately being discharged into the first liquid outlet 13-1 directly under the action of the second and third diluent outlets 16-2, 16-3 provided at a rear portion of a first water feeding channel. That is, the water flowing out of the first diluent outlet 16-1 may block at the treating agent, such as the washing powder mixed liquid, to some extent, which prolongs a mixing time of the treating agent and the water undoubtedly, thereby mixing the treating agent and the water more uniformly. Further, the second and third diluent outlets 16-2, 16-3 have different outflow directions due to structures thereof. Specifically, the second diluent outlet 16-2 has left front outflow, and the third diluent outlet 16-3 has right front outflow relative to the outflow of the second diluent outlet 16-2, such that the treating agent, such as the washing powder, located at the lower portion of the first cavity 16 may be flushed without dead zones, thereby avoiding the treating agent, such as the washing powder, being accumulated in the first cavity 16. Referring to Fig. 5, the first flow limiting wall, the second flow limiting wall, and the third flow limiting wall 16-4, 16-5, 16-6 are configured as walls formed by the bottom wall of the detergent box 1 projecting upwards. Portions of the second and first flow limiting walls 16-5, 16-4 other than the second arc segment 16-4-5 have substantially the same height up and down, and are connected to the cover 12, thereby forming several segments of closed channels, which may better guide the water. Since the second arc segment 16-4-5 of the first flow limiting wall 16-4 is located at the rear portion of the first cavity 16, and the treating agent is prone to be accumulated adjacent to the second arc segment, in the present embodiment, the second arc segment 16-4-5 has a vertical height reduced gradually in a direction in which the second arc segment 16-4-5 extends backwards and rightwards, i.e., the channel is not closed between the second arc segment 16-4-5 and the second flow limiting wall 16-5. That is, the water may overflow from the second arc segment 16-4-5 to better dissolve the treating agent deposited at the bottom of the second arc segment 16-4-5, which improves the effect of dissolving the treating agent undoubtedly. For the same reason, the third flow limiting wall 16-6 has a vertical height lower than the second flow limiting wall 16-5, thereby better dissolving the treating agent accumulated at the third flow limiting wall.

[0036] A transparent observation window (referred to as a first window 15-1 below) is provided adjacent to a middle portion of the first cavity 16 and formed into an open hole at the bottom wall of the detergent box 1, and the open hole is closed by a transparent material, such as glass. The amount of treating agent, such as the washing powder, dispensed into the first cavity 16 may be

observed outside from the first window 15-1, thereby facilitating the user to control the amount of dispensed washing powder.

[0037] In the present embodiment, the first and second cavities 16, 18 have the same structure, and thus the structure of the second cavity 18 is not described herein in detail. A structure of the third cavity 14 will be described below in detail. Referring to Fig. 3 and Fig. 5 to 6, the third liquid feeding channel is provided in the third cavity 14. Specifically, the third liquid feeding channel includes a second liquid inlet 14-7 provided at a rear end thereof. Specifically, the second liquid inlet 14-7 is formed by spacing a first flow guiding wall (referred to as a fourth flow limiting wall 14-2 below) apart from a second flow guiding wall (referred to as a fifth flow limiting wall 14-3 below). Specifically, the fourth flow limiting wall 14-2 extends leftwards and forwards in an arc shape from a tail end of a rear portion of the third cavity 14, and is connected to the first partition wall 19-1 between the first and third cavities 16, 14, such that the water is guided to the channel formed by spacing the fourth flow limiting wall 14-2 from fifth flow limiting wall 14-3 without the resistance, and guided forwards. An arc guidance segment (referred to as a third arc segment 14-8 below) is provided at a front end of the first partition wall 19-1 and formed substantially into a semicircular shape having a right end going beyond the fifth flow limiting wall 14-3, so as to reverse the water under guidance of the third arc segment 14-8 and discharge the water out of a fourth diluent outlet 14-1 at a right side of the fifth flow limiting wall 14-3 into the third cavity 14, thereby dispersing and dissolving the treating agent, such as a softener, accumulated at the rear portion of the third cavity 14. Referring to Fig. 6, a collection area 14-9 is provided at a front end of the third arc segment 14-8, and enclosed by a collection wall 14-5. Specifically, two ends of the collection wall 14-5 are connected to the third arc segment 14-8 and the second partition wall 19-2 respectively to form the collection area 14-9. Specifically, the left end of the collection wall 14-5 extends rightwards and forwards from the third arc segment 14-8 to form a left collection wall 14-5-1, the right end of the collection wall 14-5 extends leftwards and forwards from the second partition wall 19-2 to form a right collection wall 14-5-2, the left and right collection walls 14-5-1, 14-5-2 are connected by an arc connecting wall 14-5-3 provided in front thereof, and the arrangement of the arc connecting wall 14-5-3 realizes no dead zones of the whole collection wall 14-5, thereby avoiding interception of the treating agent, such as a softener mixed liquid. The left and right collection walls 14-5-1, 14-5-2 have cross sections formed into a linear shape, thereby guiding forwards the softener mixed liquid rapidly. A collection groove 14-4 is provided at a front side of the collection area 14-9, and is substantially circular, and an outflow column 14-6 is provided adjacent to a center of the collection groove 14-4. Specifically, the collection groove 14-4 is formed by recessing a bottom of the third cavity 14 downwards, and under a blocking effect of the

collection wall 14-5, a treating agent mixed liquid, such as the softener mixed liquid, may be collected into the collection groove 144 easily. The outflow column 14-6 is formed by a bottom wall of the collection groove 144 projecting upwards, an outflow hole is formed at an upper end surface of the outflow column 14-6, and thus when a liquid level of the treating agent mixed liquid in the collection groove 144 is higher than the outflow column 14-6, the treating agent mixed liquid may flow into the drum in the machine body 4 via the outflow hole for washing the laundry. Further, the fifth flow limiting wall 14-3 is formed by the bottom wall of the third cavity 14 projecting upwards, and an upper end of the fifth flow limiting wall 14-3 is connected to the cover 12, thereby forming the closed channel. Thus, the water may be better guided. The collection wall 14-5 is lower than the fifth flow limiting wall 14-3. That is, a gap is formed between the collection wall 14-5 and the cover 12, thus as shown in Figs. 5 to 6, when an outflow speed of the outflow column 14-6 is insufficient to discharge the treating agent mixed liquid in time, the treating agent mixed liquid may overflow from the collection wall 14-5 and flow into the drum in the machine body 4 from a flow outlet (referred to as a second outlet 13-2 below) provided at a front portion of the collection wall 14-5, thereby guaranteeing timely discharge of the mixed liquid.

[0038] In order to facilitate the mixed liquid to be better discharged out of the outflow hole of the outflow column 14-6, a siphon member 111 is mounted at the outflow hole. Specifically, in the present embodiment, the siphon member 111 is configured as a siphon cap which penetrates through the through hole 12-1 to cover over the outflow hole of the outflow column 14-6, such that the mixed liquid may be discharged out of the outflow hole of the outflow column 14-6 rapidly under a siphon effect.

[0039] In the present embodiment, a transparent window (a second window 15-2) is provided adjacent to a middle portion of the third cavity 14 and formed into an opening provided at the bottom wall of the detergent box 1, and the opening is closed by a transparent material. The amount of treating agent dispensed into the third cavity 14 may be observed outside from the second window 15-2, thereby facilitating the user to control the number of dispensed treating agent.

[0040] A working process of the present embodiment will be described below.

[0041] When the detergent is required to be dispensed, the door 5 is rotated to pull out the detergent box 1, the user dispenses the detergent, such as the washing powder and the softener, into the detergent box 1 from the corresponding first, second and third dispensing ports 11-1, 11-2, 11-3, may observe the dispensed amount from the first and second windows, and may stop dispensing when a preset dispensing amount is reached; then the door 5 is rotated reversely to be closed, the detergent box 1 is lowered into the opening 6, and thus the water is injected into the detergent box 1 by the water feeding spray nozzle 3 located in the opening 6. The wa-

ter in one direction enters the first liquid feeding channel via the first liquid inlet 16-7 formed by the interval between the first arc segment 16-4-1 and the second flow limiting wall 16-5, is reversed under guidance of the second arc segment 16-4-3 and sprayed out of the first, second and third diluent outlets 16-1, 16-2, 16-3, and thus the treating agent placed into the first cavity may be dispersed adequately, mixed uniformly and flows into the drum via the first liquid outlet 13-1 for washing the laundry.

[0042] The water in another direction enters the third liquid feeding channel via the second liquid inlet 14-7, is guided by the third arc segment 14-8, is reversed and enters the third cavity via the fourth diluent outlet 14-1 to dissolve the treating agent, such as the softener, accumulated in the third cavity, the softener mixed liquid flows into the drum through the outflow column 14-6 located in front of the third cavity, and if a flow of the mixed liquid is too large, the mixed liquid will overflow from the collection wall 14-5 located in front of the outflow column 14-6 and flows into the drum via the second outlet 13-2, thereby guaranteeing timely discharge of the mixed liquid.

[0043] Other components and operations of the washing machine according to the embodiment of the present invention are known to persons skilled in the art, and are not described in detail herein.

[0044] In the description of the present specification, reference throughout this specification to "one embodiment", "some embodiments", "exemplary embodiment", "example", "specific example", "some examples" or the like means that a particular feature, structure, material, or characteristic described in connection with the embodiment or example is included in at least one embodiment or example of the present invention. In the specification, the schematic expressions to the above-mentioned terms are not necessarily referring to the same embodiment or example. Furthermore, the described particular features, structures, materials, or characteristics may be combined in any suitable manner in one or more embodiments or examples.

[0045] Although embodiments of the present invention have been shown and illustrated, it shall be appreciated by those skilled in the art that various changes, modifications, alternatives and variants without departing from the principle and idea of the present disclosure are acceptable. The scope of the present application is defined by the claims and its equivalents.

Claims

1. A dispensing device, comprising:

a body having a dispensing port through which a treating agent being dispensed to a preset position in the body;

a liquid feeding channel provided at the body and provided with a liquid inlet configured to in-

- introduce a diluent, at least one liquid feeding channel being provided with a plurality of diluent outlets, and the liquid feeding channel being configured to guide the diluent to the plurality of diluent outlets to discharge the diluent, so as to mix the diluent with the treating agent to form a mixed liquid; and
a liquid outlet configured to guide the mixed liquid out of the body.
2. The dispensing device according to claim 1, wherein the plurality of diluent outlets open towards the preset position, such that the diluent flows towards the preset position after discharged from the plurality of diluent outlets.
 3. The dispensing device according to claim 2, wherein the dispensing port is provided at one end of the body, the liquid inlet is provided at the other end opposite to the dispensing port, and the preset position is adjacent to the liquid inlet.
 4. The dispensing device according to claim 3, wherein the liquid feeding channel comprises a first flow limiting wall and a second flow limiting wall, the first flow limiting wall comprises a left side wall and a right side wall connected to each other by an arc wall, and the second flow limiting wall is inserted between the left side wall and the right side wall.
 5. The dispensing device according to claim 4, wherein the diluent outlets comprises a first diluent outlet, a second diluent outlet, and a third diluent outlet; the left side wall has a first arc segment spaced apart from the second flow limiting wall to form the liquid inlet, and the left side wall further comprises a first linear segment extending from the first arc segment to the dispensing port and connected to one end of the arc wall; and the right side wall comprises a second linear segment connected to the other end of the arc wall, and a notch is defined adjacent to a joint between the arc wall and the second linear segment and formed into the first diluent outlet.
 6. The dispensing device according to claim 5, wherein the liquid feeding channel further comprises a third flow limiting wall; the right side wall further comprises a second arc segment extending from the second linear segment to the liquid inlet, the third flow limiting wall is spaced apart from the second arc segment to form the second diluent outlet, and the third diluent outlet is defined between the third flow limiting wall and the second flow limiting wall; and the first diluent outlet is more adjacent to the dispensing port than the second diluent outlet and/or the third diluent outlet, and the preset position is located between the first diluent outlet and the second diluent outlet and/or the third diluent outlet.
 7. The dispensing device according to claim 6, wherein at least a part of the third flow limiting wall is formed into a shape of an arc, the third flow limiting wall extends towards the right side wall, a fork portion is formed at an end of the second flow limiting wall adjacent to the liquid inlet and has a first fork wall and a second fork wall, the first fork wall is adjacent to the third flow limiting wall and spaced apart from the third flow limiting wall to define the third diluent outlet, the first fork wall is formed into a shape of an arc and extends away from the right side wall, and the second fork wall is spaced apart from the first arc segment to define the liquid inlet.
 8. The dispensing device according to any one of claims 1 to 7, wherein the body has a bottom wall and a box-shaped structure enclosed by a side wall projecting upwards from the bottom wall, the liquid feeding channel is provided in the box-shaped structure; and an area of the box-shaped structure adjacent to the liquid inlet is formed as the preset position.
 9. The dispensing device according to claim 8, wherein the liquid outlet is adjacent to the dispensing port and formed into an open slot provided at the bottom wall.
 10. The dispensing device according to claim 8 or 9, further comprising a transparent observation window configured as an open hole provided at the bottom wall and closed by a transparent material.
 11. The dispensing device according to any one of claims 8 to 10, wherein the dispensing device further comprises a cover covering over the body and connected to the side wall.
 12. The dispensing device according to claim 11, wherein the first flow limiting wall, the second flow limiting wall, and the third flow limiting wall are formed by the bottom wall projecting upwards, and at least parts of the first flow limiting wall and the second flow limiting wall are connected to the cover, such that at least a part of the liquid feeding channel is formed into a closed channel.
 13. The dispensing device according to claim 12, wherein a portion of the second arc segment of the first flow limiting wall located adjacent to the liquid inlet has a height reducing gradually towards the liquid inlet, such that an overflow space is defined between the second arc segment and the cover.
 14. The dispensing device according to claim 12 or 13, wherein the third flow limiting wall is formed by a bottom of the body projecting upwards and is not connected to the cover, such that an overflow space is defined between the third flow limiting wall and the

cover.

15. The dispensing device according to any one of claims 11 to 14, further comprising a partition wall formed by the bottom wall projecting upwards and connected to the cover, so as to partition the box-shaped structure into a plurality of independent cavities, wherein the plurality of liquid feeding channels are provided in the plurality of cavities respectively.
16. A laundry treating device, comprising a machine body and the dispensing device according to any one of claims 1 to 15.

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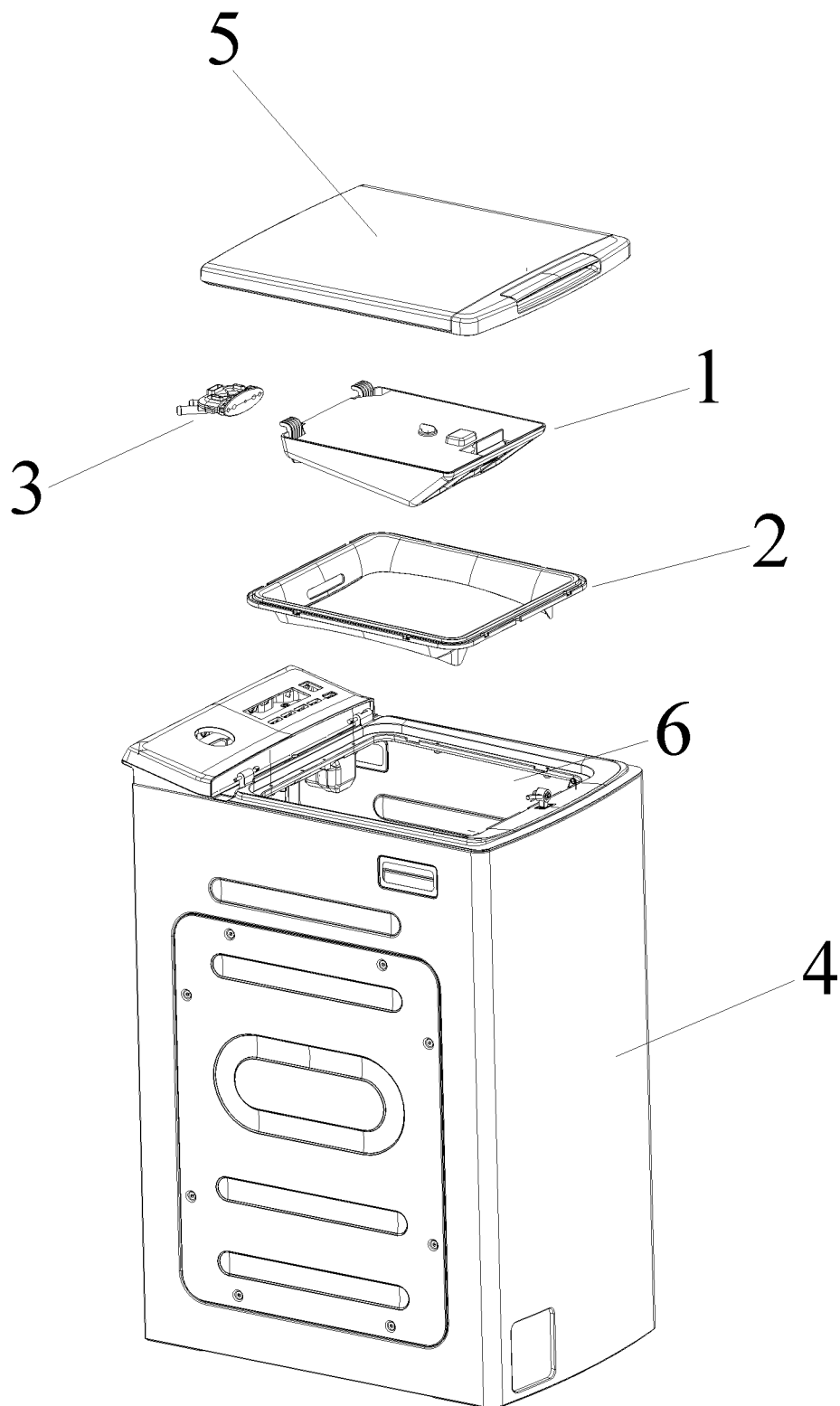


Fig. 1

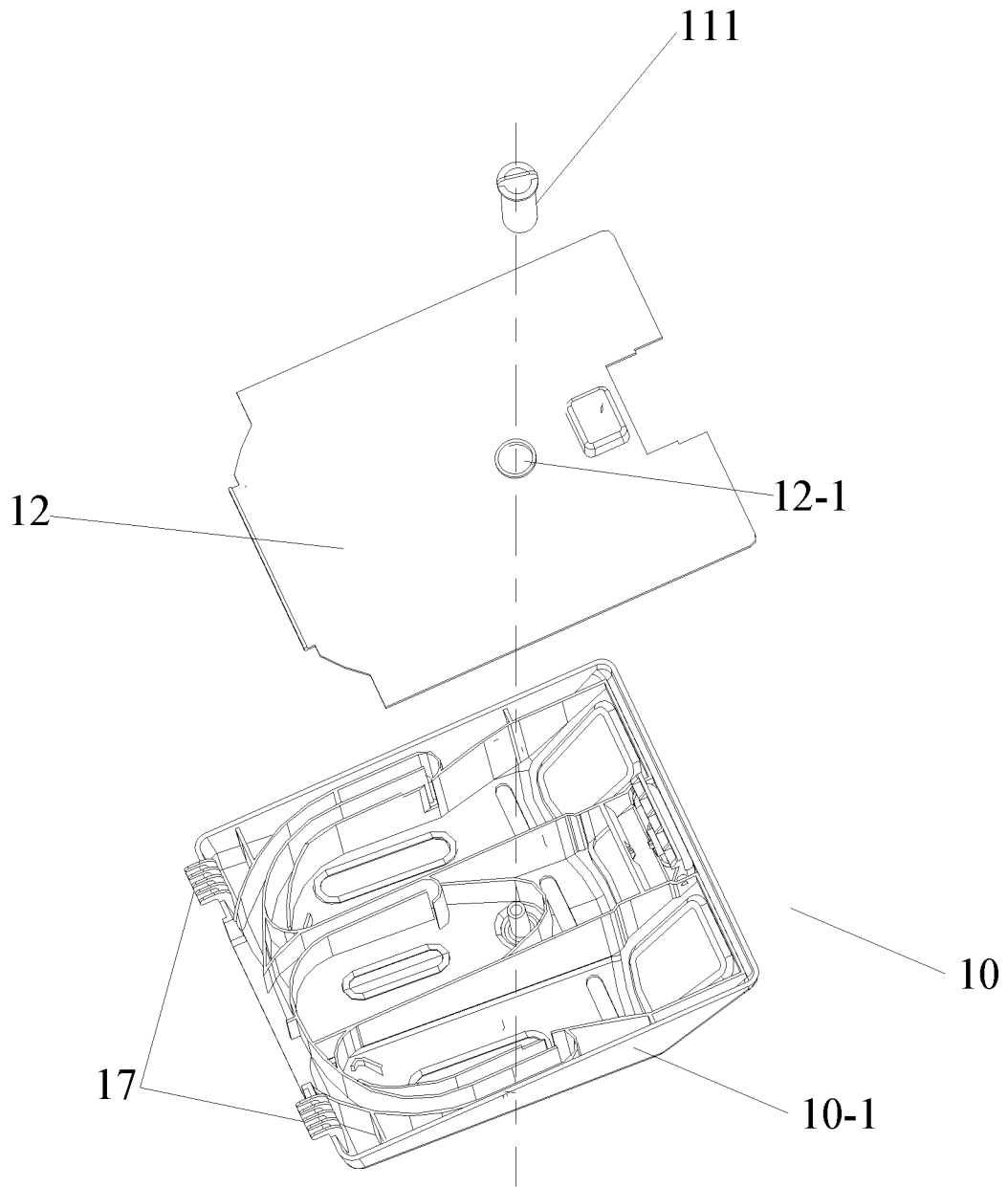


Fig. 2

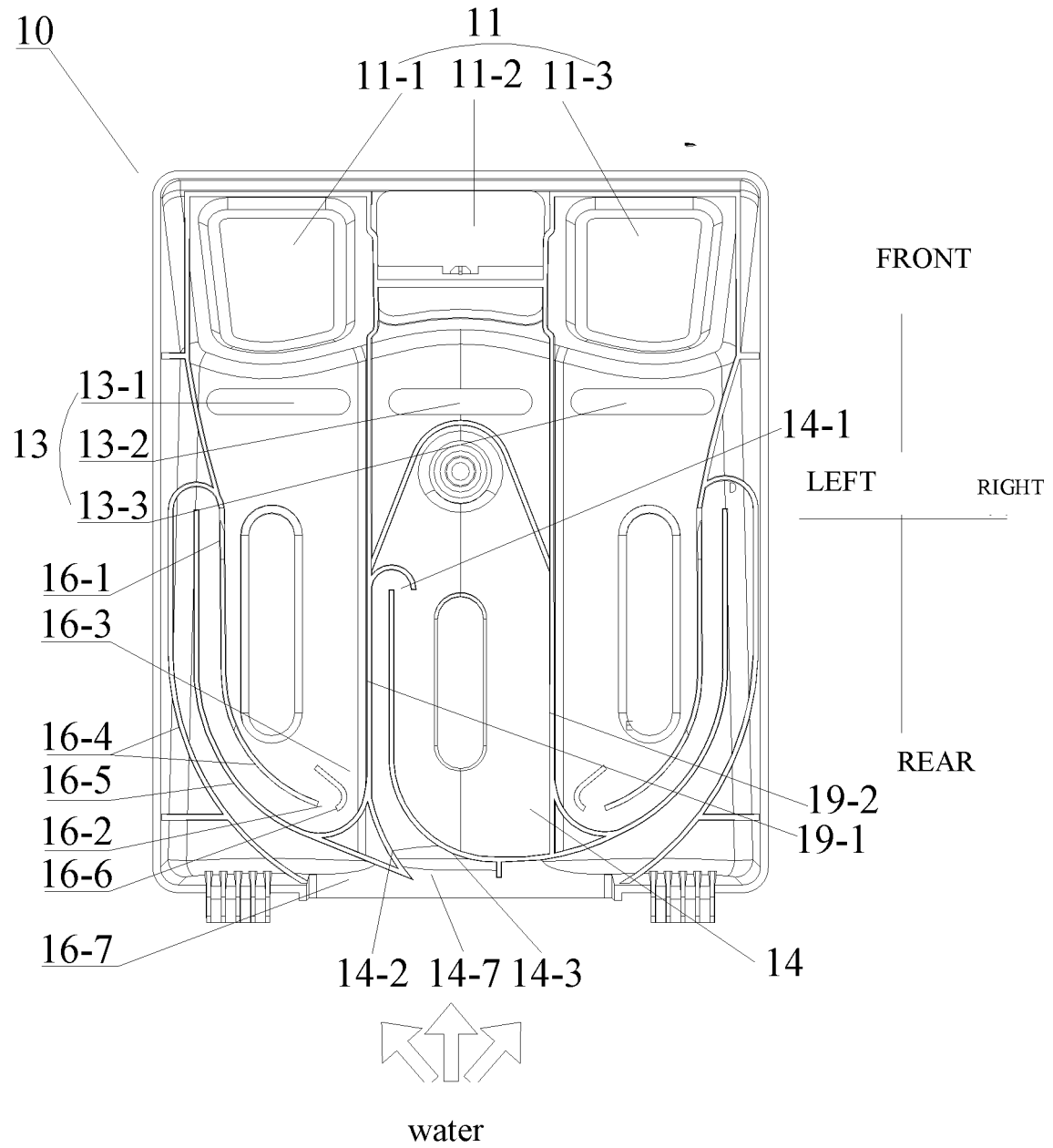


Fig. 3

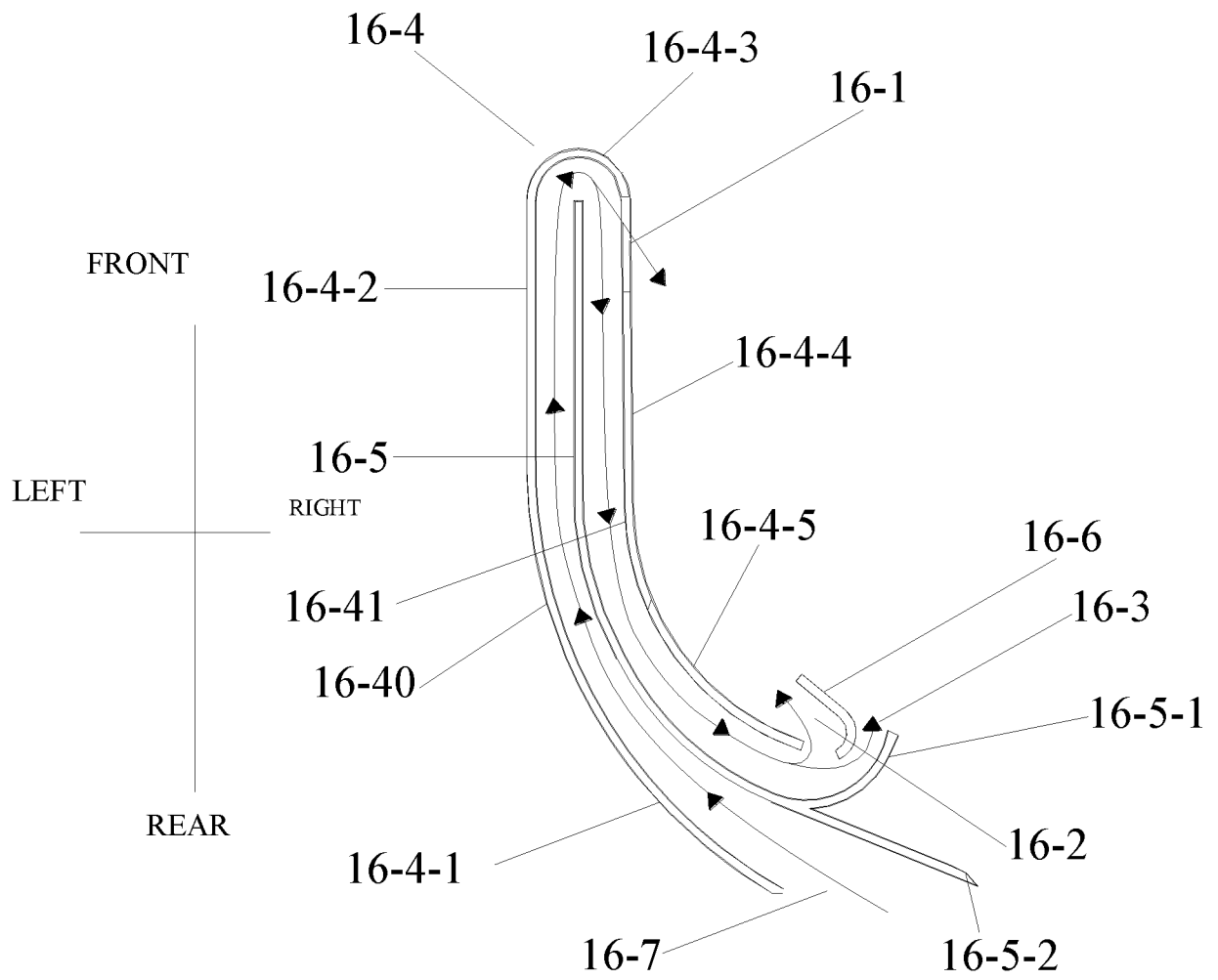


Fig. 4

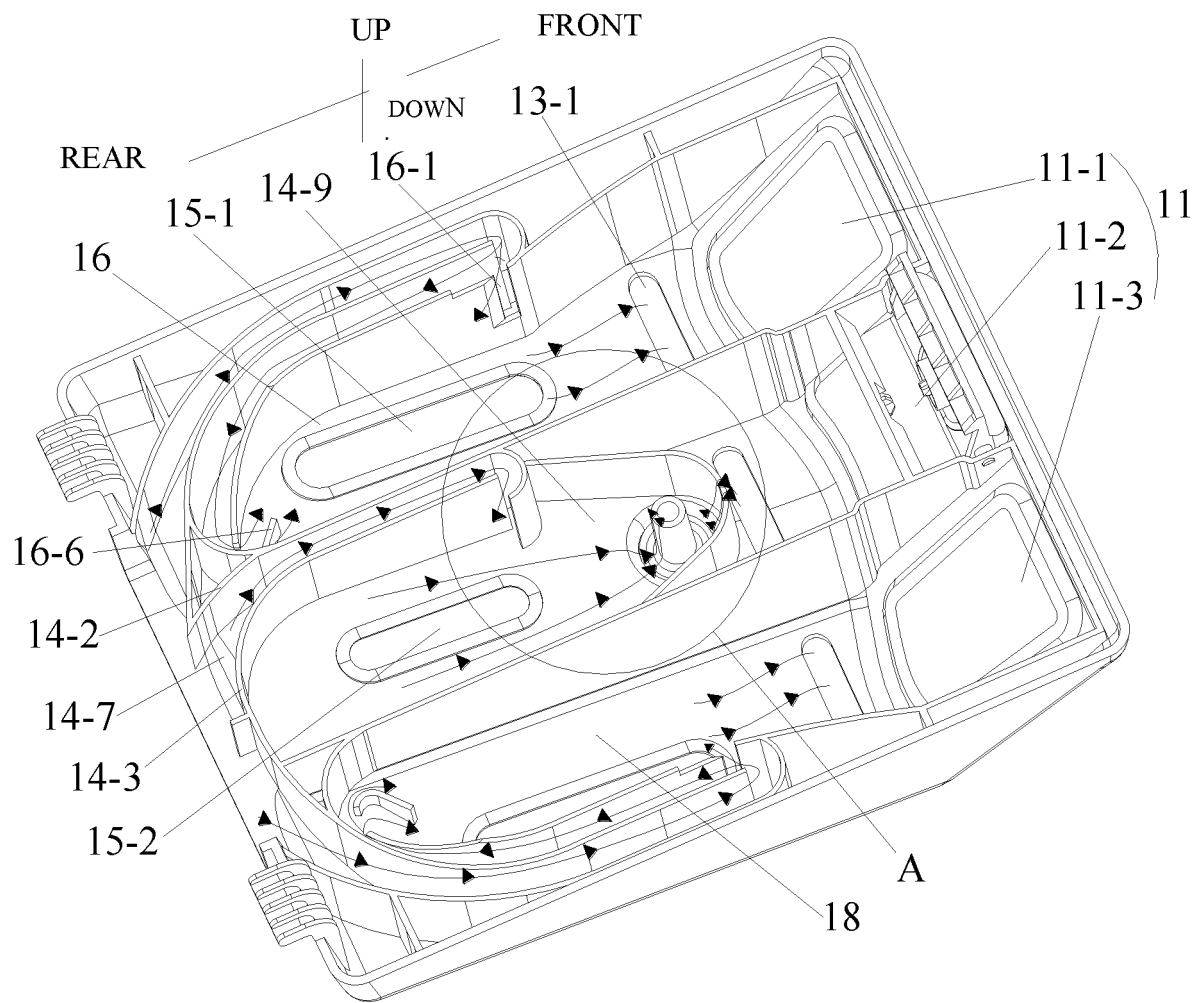


Fig. 5

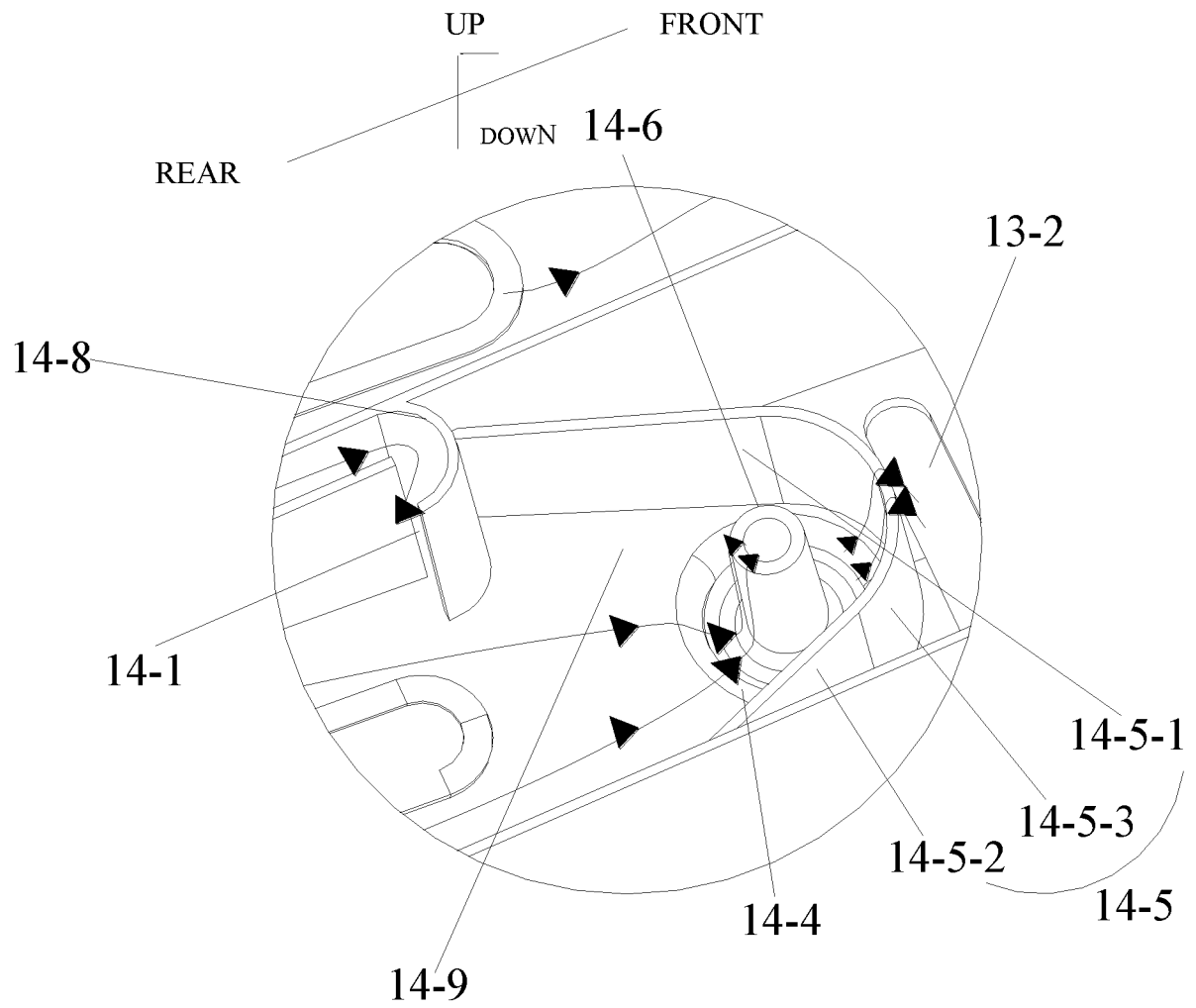


Fig. 6

INTERNATIONAL SEARCH REPORT

International application No.

PCT/CN2018/104014

A. CLASSIFICATION OF SUBJECT MATTER

D06F 39/02(2006.01)i

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

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

D06F

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

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

CNTEXT; CNABS; DWPI; SIPOABS; CNKI: 海尔, 洗碗机, 洗衣机, 分配器, 小天鹅, 复数, 第二, 两, 三, 二, 多, 出口, 口, 嘴, 孔, 道, 路, 径, 方向, 角度, 溶解, 冲, 残留, 残存, 稀释, 混合, 处理剂, 柔软剂, 柔顺剂, 洗涤剂, 观察窗, 观察, 底, 下, 投放, second, two, three, several, multi+, outlet, exit, opening, hole, drain+, exhaust

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CN 201614503 U (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD. ET AL.) 27 October 2010 (2010-10-27) description, paragraphs [0020]-[0022], and figures 1-6	1-4, 8, 9, 11, 16
X	CN 203420134 U (PANASONIC HOME APPLIANCES R&D CENTER (HANGZHOU) CO., LTD. ET AL.) 05 February 2014 (2014-02-05) description, paragraphs [0026]-[0040], and figures 1-9	1-4, 8, 9, 11, 16
X	CN 1465801 A (LG ELECTRONICS (TIANJIN) ELECTRICAL APPLIANCE CO., LTD.) 07 January 2004 (2004-01-07) description, pages 4-10, and figures 2-8	1-4, 8, 9, 11, 16
A	CN 1465801 A (LG ELECTRONICS (TIANJIN) ELECTRICAL APPLIANCE CO., LTD.) 07 January 2004 (2004-01-07) entire document	5-7, 10, 12-15

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

* Special categories of cited documents:	"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
"A" document defining the general state of the art which is not considered to be of particular relevance	"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
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"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"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	

Date of the actual completion of the international search 19 May 2019	Date of mailing of the international search report 29 May 2019
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.

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT
Information on patent family members

International application No.

PCT/CN2018/104014

Patent document cited in search report	Publication date (day/month/year)	Patent family member(s)	Publication date (day/month/year)
CN 201614503 U	27 October 2010	None	
CN 203420134 U	05 February 2014	None	
CN 1465801 A	07 January 2004	CN 100383328 C	23 April 2008

Form PCT/ISA/210 (patent family annex) (January 2015)

REFERENCES CITED IN THE DESCRIPTION

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