

DESCRIPTION

WASHING MACHINE

TECHNICAL FIELD

[0001] The present disclosure relates to a washing machine.

BACKGROUND ART

[0002] For example, PTL 1 discloses a washing machine that treats laundry using silver crystal as a sterile filtration agent.

[0003] The washing machine described in PTL 1 includes a silver crystal unit accommodating the silver crystal, and a water filling device for supplying water to the silver crystal unit. By supplying water to the silver crystal unit, the water contacts with the silver crystal to become silver ion water, and is input to the washing tub. Silver ion water exerts a sterile filtration effect on laundry.

Citation List

Patent Literature

[0004] PTL 1: Unexamined Japanese Patent Publication No. 2021-122527

SUMMARY OF THE INVENTION

[0005] There is still room for improvement in a washing machine including a solid agent case.

[0006] A washing machine of one aspect of the present disclosure includes: a washing tub rotatably provided in a housing; and a laundry agent supply unit that supplies laundry agent to the washing tub, in which the laundry agent supply unit includes a first laundry agent case provided with a first laundry agent input port through which a first laundry agent is input, the first laundry agent case accommodating and supplying, to the washing tub, the first laundry agent, a second laundry agent case provided with a second laundry agent input port through which a second laundry agent different from the first laundry agent is input, the second laundry agent case accommodating and supplying, to the washing tub, the second laundry agent, and a solid agent case provided with a solid agent input port into which a solid agent is input, the solid agent case accommodating and supplying, to the washing tub, the solid agent, and the solid agent input port is disposed

between the first laundry agent input port and the second laundry agent input port.

[0007] A washing machine of one aspect of the present disclosure includes: a washing tub rotatably provided in a housing; and a laundry agent supply unit that supplies laundry agent to the washing tub, in which the laundry agent supply unit includes a first laundry agent case provided with a first laundry agent input port through which a first laundry agent is input, the first laundry agent case accommodating and supplying, to the washing tub, the first laundry agent, and a solid agent case provided with a solid agent input port through which a solid agent that is water-soluble is input, the solid agent case accommodating and supplying, to the washing tub, the solid agent, and the first laundry agent case is provided with a laundry agent accommodation space accommodating the first laundry agent and a restrictor restricting passage of the solid agent.

[0008] A washing machine of one aspect of the present disclosure includes: a washing tub rotatably provided in a housing; and a solid agent case including a solid agent accommodation space accommodating a solid agent that is water-soluble, and supplying, to the washing tub, the solid agent dissolved in water, in which the solid agent case is removably provided in the housing, the solid agent accommodation space is defined by a facing wall surface in a state where the solid agent case is attached to the housing, and a facing state of the wall surface is releaseable in a state where the solid agent case is removed from the housing.

[0009] According to the present disclosure, an improved washing machine with a solid agent case can be provided.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] Fig. 1 is a perspective view of a washing machine of a first exemplary embodiment according to the present disclosure.

Fig. 2 is a perspective view of a laundry agent supply unit.

Fig. 3 is a perspective view of the laundry agent supply unit.

Fig. 4 is a perspective view of a manual input unit.

Fig. 5 is a sectional view of the manual input unit.

Fig. 6 is a perspective view of the manual input unit.

Fig. 7 is a perspective view of an input port member.

Fig. 8 is a perspective view of the input port member.

Fig. 9A is a perspective view of a tablet case.

Fig. 9B is a perspective view of the tablet case.
Fig. 9C is a plan view of the tablet case.
Fig. 9D is a sectional view of the tablet case.
Fig. 10A is a perspective view of a tablet.
Fig. 10B is a perspective view of the tablet.
Fig. 11 is a top view of the laundry agent supply unit.
Fig. 12 is a sectional view of the laundry agent supply unit.
Fig. 13 is an enlarged perspective view of a water supply nozzle.
Fig. 14A is a sectional view of a water supply nozzle.
Fig. 14B is a sectional view of the water supply nozzle.
Fig. 15A is a schematic sectional view of the tablet case.
Fig. 15B is a sectional view of a part of the laundry agent supply unit.
Fig. 15C is a sequence diagram of a sterile filtration course.
Fig. 16 is a perspective view of a washing machine of a second exemplary embodiment according to the present disclosure.
Fig. 17 is a perspective view of the laundry agent supply unit.
Fig. 18 is a perspective view of the laundry agent supply unit.
Fig. 19 is a perspective view of the manual input unit.
Fig. 20 is a perspective view of the manual input unit.
Fig. 21 is a sectional view of the manual input unit.
Fig. 22 is a perspective view of the tablet case.
Fig. 23 is a perspective view of a tablet case in a released state.
Fig. 24 is a sectional view of the tablet case.
Fig. 25 is a sectional view of the laundry agent supply unit.

DESCRIPTION OF EMBODIMENT

[0011] (Underlying knowledge and the like of present disclosure)

At the time when the inventors conceived of the present disclosure, a water-soluble solid agent containing sodium dichloroisocyanurate was known as a technique of a sterile filtration agent for bath cleaning. With the technique of a sterile filtration agent for bath cleaning as a hint, the inventors have obtained an idea of a washing machine that applies a component of a solid agent to laundry by inputting a single-use, water-soluble solid agent. Then, the inventors have found that there are two problems in achieving the

idea. One is a problem of necessity of suppressing the solid agent from being erroneously supplied to the washing tub in a state of being not dissolved. The other is a problem of necessity of cleaning by removing fragments of the solid agent remaining inside the case accommodating the solid agent without being completely dissolved. In order to solve these problems, the inventors have come to constitute the subject matter of the present disclosure.

[0012] (First exemplary embodiment)

Washing machine 1 according to the first exemplary embodiment of the present disclosure will be described.

[0013] [Overall configuration]

Fig. 1 is a perspective view illustrating washing machine 1 of the first exemplary embodiment according to the present disclosure. As illustrated in Fig. 1, washing machine 1 includes housing 2, water tub 3, washing tub 4, laundry agent supply unit 5, and controller C.

[0014] <Housing>

Housing 2 is a member forming an external appearance of washing machine 1. An upper surface of housing 2 is provided with opening 20 and an openable door 21 covering opening 20.

[0015] <Water tub>

Water tub 3 is a substantially cylindrical member provided inside housing 2 and having one end closed so as to accumulate washing water. Water tub 3 may be called an outer tub.

[0016] <Washing tub>

Washing tub 4 is a substantially cylindrical member rotatably provided inside water tub 3 and accommodating laundry such as clothes. In washing tub 4, a large number of through-holes 40 communicating with water tub 3 are formed. Through-holes 40 enable movement of washing water and a laundry agent between water tub 3 and washing tub 4. Washing tub 4 further includes opening 41 at a position facing opening 20 of housing 2. Laundry is input to washing tub 4 through opening 41. Washing tub 4 may be called a drum or an inner tub.

[0017] <Laundry agent supply unit>

Laundry agent supply unit 5 is a unit that supplies washing tub 4 with a washing treatment agent such as a liquid agent, a powdery detergent, and a solid agent. Supplying a

washing treatment agent means ejecting one downward toward washing tub 4. The liquid agent is a liquid agent used for washing laundry such as clothes. The liquid agent may include a detergent, a softener, or a neutral detergent.

[0018] Laundry agent supply unit 5 includes manual input unit 6 and automatic input unit 7.

[0019] <Controller>

Controller C is a member that controls the operation of washing machine 1.

Controller C includes, for example, a memory (not illustrated) storing a program and a processing circuit (not illustrated) corresponding to a processor such as a CPU, and the processor may execute the program to function as these elements.

[0020] Subsequently, the configuration of laundry agent supply unit 5 will be described with reference to Figs. 2 and 3. Figs. 2 and 3 are perspective views of laundry agent supply unit 5.

[0021] As illustrated in Fig. 2, laundry agent supply unit 5 includes unit case 50, lid 50a, manual input unit 6, automatic input unit 7, water supply member 10, and channel member 11 (Fig. 3).

[0022] As illustrated in Fig. 3, unit case 50 is a member accommodating manual input unit 6, automatic input unit 7, and channel member 11. An upper portion of unit case 50 is opened and covered with lid 50a.

[0023] Manual input unit 6 is a mechanism for a user to manually input a load of laundry agent such as a liquid agent, a powdery detergent, or a solid agent every time washing machine 1 is operated. The laundry agent to be input to manual input unit 6 flows into washing tub 4 with an input amount.

[0024] The load of laundry agent to be input to manual input unit 6 is accommodated in a plurality of cases 60, 61, 62, and 63 formed by manual input unit 6. In the first exemplary embodiment, cases 60, 61, 62, and 63 accommodate a load of detergent, softener, powdery detergent, and water-soluble solid agent (e.g., tablet).

[0025] Automatic input unit 7 is a mechanism that automatically inputs a predetermined amount of liquid agent from a tank storing the liquid agent into washing tub 4. Automatic input unit 7 inputs, to washing tub 4, an appropriate amount of a liquid agent of an appropriate type in accordance with the amount and type of laundry, for example.

Automatic input unit 7 includes two tanks 70 and 71 aligned in width direction K (e.g., in the horizontal direction) and accommodating a liquid agent, and a pump (not illustrated)

that sucks and discharges the liquid agent. In the first exemplary embodiment, tank 70 accommodates a detergent, and tank 71 accommodates a softener.

[0026] Water supply member 10 is a mechanism for supplying water to laundry agent supply unit 5 via channel member 11. Water supply member 10 includes a plurality of water supply valves 10a, 10b, and 10c, and a supply destination of water can be changed by opening and closing water supply valves 10a, 10b, and 10c. Specifically, when water supply valve 10a is opened, water is supplied to cases 61 and 62, when water supply valve 10b is opened, water is supplied to cases 60 and 63, and when water supply valve 10c is opened, water is supplied to automatic input unit 7. Water supply valves 10a, 10b, and 10c are electromagnetic valves, for example.

[0027] Channel member 11 is a member guiding, to the supply destination, water supplied from water supply valves 10a, 10b, and 10c. Channel member 11 is provided at the upside of cases 60, 61, 62, and 63, and is connected to water supply valves 10a, 10b, and 10c. More specifically, channel member 11 forms a plurality of independent paths communicating from water supply valves 10a, 10b, and 10c to the supply destination.

[0028] The water supplied to cases 60, 61, 62, and 63 of manual input unit 6 flows into washing tub 4 together with the accommodated laundry agent.

[0029] Subsequently, the configuration of manual input unit 6 will be described in more detail with reference to Figs. 3 to 6. Fig. 4 is a perspective view of manual input unit 6. Fig. 5 is a sectional view illustrating a state in which case 63 and input port members 65 and 66 are removed from manual input unit 6. Fig. 6 is a perspective view illustrating a state in which case 63 and input port members 65 and 66 are removed from manual input unit 6.

[0030] As illustrated in Fig. 3, manual input unit 6 includes body 64. Body 64 is a member held drawably in front-rear direction L in unit case 50.

[0031] As illustrated in Fig. 4, body 64 accommodates input port members 65 and 66 and case 63 (hereinafter, tablet case 63). Input port members 65 and 66 and tablet case 63 are removably accommodated in body 64.

[0032] As illustrated in Figs. 4 and 5, body 64 is provided with cases 60, 61, and 62 accommodating the laundry agent side by side in width direction K. As described above, case 60 (hereinafter, detergent case 60) accommodates a detergent, case 61 (hereinafter, softener case 61) accommodates a softener, and case 62 (hereinafter, powdery detergent case 62) accommodates a powdery detergent. In body 64, detergent case 60 and powdery

detergent case 62 are adjacent to each other. On the other hand, space 67 is provided between detergent case 60 and softener case 61, and tablet case 63 is disposed in space 67.

[0033] As illustrated in Fig. 5, softener case 61 includes accommodation space 78 accommodating a softener and liquid agent discharge channel 74. Liquid agent discharge channel 74 has a U shape extending upward from suction port 74a, folded back at the upper portion of softener case 61, and connected to bottom surface 78a of accommodation space 78. Liquid agent discharge channel 74 sucks up the softener from suction port 74a and discharges the softener from opening 61a formed in bottom surface 78a of accommodation space 78.

[0034] Detergent case 60 includes accommodation space 77 accommodating detergent and liquid agent discharge channel 73. Liquid agent discharge channel 73 has a U shape similarly to liquid agent discharge channel 74.

[0035] Input port member 65 is disposed in accommodation space 77, and forms input port 65a provided for inputting detergent. Input port member 66 is disposed in accommodation space 78 and forms input port 66a provided for input of the softener.

[0036] More specifically, input port member 65 is disposed so as to cover liquid agent discharge channel 73 of detergent case 60, and input port member 66 is disposed so as to cover liquid agent discharge channel 74 of softener case 61. When input port members 65 and 66 cover liquid agent discharge channels 73 and 74, channels are formed between input port members 65 and 66 and liquid agent discharge channels 73 and 74. With such a structure, when the liquid level in cases 60 and 61 exceeds a predetermined height, the water and the liquid agent can go beyond the tops of liquid agent discharge channels 73 and 74. That is, until the liquid level exceeds the predetermined height by opening water supply valve 10a or water supply valve 10b and supplying water to case 60 or case 61, the detergent or the softener does not flow out from cases 60 and 61 and can be held in cases 60 and 61. Even after water supply valve 10a or water supply valve 10b is closed and the water supply is stopped, the liquid agent and the water in case 60 or case 61 are discharged from opening 60a or opening 61a due to the siphon phenomenon in the channel between input port members 65 and 66 and liquid agent discharge channels 73 and 74. Therefore, water can be prevented from remaining in case 60 or case 61.

[0037] On the other hand, in powdery detergent case 62, a member forming an input port is not disposed, and is open upward over the entire upper surface.

[0038] Tablet case 63 is a member accommodating a water-soluble solid agent used in

one sterile filtration washing course. When the solid agent is applied with water, the solid agent is dissolved, and a dissolved object of the solid agent is supplied to washing tub 4. The solid agent is a solid or hollow solid substance. For example, the solid agent is a solid object formed from a compacted bulk powder. The solid agent may be called a solid treatment agent. In the first exemplary embodiment, tablet J will be described as an example of solid agent.

[0039] Here, tablet J contains a component exhibiting sterile filtration performance. Tablet J contains a water-soluble component, and has a certain shape before water supply, but once applied with water, tablet J is decomposed into small fragments and dissolves in water.

[0040] Regarding the constituent material of tablet J, tablet J may contain a component that generates hypochlorous acid. In the first exemplary embodiment, tablet J contains sodium dichloroisocyanurate as a sterile filtration component. Tablet J may further contain a component that foams in reaction to water.

[0041] Regarding the shape of tablet J, tablet J may have a shape movable to a predetermined position in tablet case 63, and has an outer peripheral shape or a contour that allows tablet J to move by rolling, for example. In the first exemplary embodiment, tablet J has a disk shape (Fig. 10A and Fig. 10B) in which diameter D0 is larger than thickness T0.

[0042] Tablet J to be input to tablet case 63 may be specific tablet J assumed to be used by the manufacturer of washing machine 1. For example, tablet J may be one or a plurality of types of specified tablets J. For example, the type of tablet J may be a type selected from a catalog or a list stored in controller C.

[0043] Tablet case 63 forms input port 63a for inputting tablet J on front side L1. When tablet case 63 is disposed in body 64, input port 63a is disposed between input port 65a and input port 66a aligned in width direction K.

[0044] Tablet case 63 is fixed by being caught on a wall of body 64 defining space 67. Specifically, tablet case 63 includes catcher 80a protruding outward of tablet case 63, catcher 81a, and grip 81b, and catcher 80a, catcher 81a, and grip 81b are caught on body 64.

[0045] As illustrated in Fig. 6, bottom surface 64a of body 64 is provided with openings 60a, 61a, 62a, and 67a at positions corresponding to cases 60, 61, and 62 and space 67, respectively. When water is supplied from water supply member 10 to each of cases 60,

61, 62, and 63, the accommodated liquid agent flows out toward washing tub 4 from openings 60a, 61a, 62a, and 67a, respectively, together with water.

[0046] Figs. 7 and 8 are perspective views of input port member 65. Hereinafter, only input port member 65 will be illustrated and described, but input port member 66 has a similar structure. Input port member 66 includes guide 168 (Fig. 4) similarly to guide 68 of input port member 65.

[0047] As illustrated in Figs. 7 and 8, input port member 65 includes guide 68, guide 69, and engagement portion 75. Guide 68 is a wall defining the range of input port 65a, and guides the liquid agent to input port 65a from the periphery of input port 65a. Guide 69 is a channel member extending downward from input port 65a, and guides the liquid agent from input port 65a to the inside of input port member 65 (case 60). Engagement portion 75 is a channel member covering liquid agent discharge channel 73.

[0048] As illustrated in Fig. 7, when the user erroneously inputs tablet J into input port 65a, guide 68 extends in a direction intersecting the travel direction (arrow A1) of tablet J about to pass through input port 65a. In the first exemplary embodiment, guide 68 extends along the lateral direction with respect to tablet J input in the up-down direction.

[0049] The opening size of input port 65a defined in guide 68 is smaller than the outer shape size of tablet J. The opening size is the maximum dimension across input port 65a. More specifically, length D1 of the diagonal line of input port 65a is smaller than diameter D0 of tablet J. Therefore, regardless of the posture of tablet J, tablet J is less likely to pass through input port 65a. In the first exemplary embodiment, input port 65a has a substantially quadrangular shape or a rounded quadrangular shape. Therefore, when tablet J is a disk, even when the dimensional difference between length D1 and diameter D0 is small, tablet J is less likely to fit into input port 65a, and tablet J is easily collected from near input port member 65.

[0050] Guide 68 defining input port 65a through which tablet J is less likely to pass functions as a restrictor. In the present specification, the restrictor is a member that restricts in advance that tablet J erroneously reaches the inside of washing tub 4. The restrictor has a structure that hinders entry of tablet J when tablet J input to a wrong case (i.e., a case other than tablet case 63) is to proceed to the back of the case, for example, accommodation space 77. The restrictor may be a narrowing of a passage, a projection protruding in a direction intersecting the direction in which tablet J is to proceed, a mesh, or the like. On the other hand, the restrictor is configured so as not to hinder passage of the

liquid agent normally input to the case.

[0051] As illustrated in Fig. 8, guide 69 guides the liquid agent input from input port 65a to detergent case 60. One side surface of guide 69 is opened, and the liquid agent having been input is guided along arrow A1. Guide 69 has flat surface 69a at a position facing input port 65a. Even when a part of tablet J is dissolved and becomes small and tablet J passes through input port 65a, flat surface 69a receives tablet J, whereby it is possible to suppress tablet J from reaching the bottom surface of accommodation space 77 and becoming difficult to take out.

[0052] Figs. 9A and 9B are perspective views of tablet case 63. Fig. 9C is a plan view of tablet case 63. Fig. 9D is a sectional view of tablet case 63 taken along line A-A in Fig. 9C. Figs. 10A and 10B are perspective views of tablet J.

[0053] In the first exemplary embodiment, tablet case 63 includes one side wall 80, and has a one-side open structure in which an opposite side surface is open.

[0054] As illustrated in Fig. 9A, one surface of side wall 80 is provided with peripheral wall 81, protrusion 87, protrusion 88, protrusion 83a, and protrusion 83b so as to protrude in width direction K (short direction). Peripheral wall 81 protrudes from the outer peripheral portion of side wall 80, and forms the front surface, the bottom surface, and the back surface of tablet case 63. Protrusions 87 and 88 are provided inside peripheral wall 81. Protrusions 83a and 83b are provided on the upper portion of side wall 80.

[0055] As illustrated in Fig. 9B, the other surface of side wall 80 is provided with catcher 80a. Catcher 80a protrudes in an opposite orientation (outside of tablet case 63) to peripheral wall 81. By catching catcher 80a on detergent case 60, tablet case 63 is supported by body 64 (Fig. 5).

[0056] As illustrated in Fig. 9A, an upper portion of tablet case 63 and a surface facing side wall 80 are opened. In the first exemplary embodiment, outer wall 89 (Fig. 9D) of softener case 61 functions as the other side wall of tablet case 63.

[0057] Side wall 80 has mesh 82 penetrating in the thickness direction (width direction K) of side wall 80. Tablet J having been dissolved flows out from mesh 82 together with water and is supplied to washing tub 4.

[0058] Peripheral wall 81 includes inclined surface 84, vertical wall 85, and bottom wall 86 that are aligned in front-rear direction L. Inclined surface 84 is a wall inclined downward toward rear side L2 with respect to the horizontal below input port 63a. Inclined surface 84 guides tablet J input to input port 63a to water supply position K1 on rear side

L2 along the direction of gravity. Vertical wall 85 is a wall extending downward from the lower end of inclined surface 84, and forms a level difference between inclined surface 84 and bottom wall 86. Bottom wall 86 is a wall extending in front-rear direction L from the lower end of vertical wall 85. Bottom wall 86 defines water supply position K1 at a position on rear side L2 away from the lower end of vertical wall 85.

[0059] Here, water supply position K1 is a position of bottom wall 86 where tablet J at the time of water supply is disposed. Water supply position K1 is a position where tablet J is assumed to reach after being input.

[0060] Water supply position K1 forms accommodation space K10 for accommodating a tablet together with peripheral wall 81 and protrusion 88. Accommodation space K10 is a region where tablet J exists in a state where tablet J is accommodated in tablet case 63. Accommodation space K10 may be larger than the outer shape of tablet J. In other words, the dimension of accommodation space K10 is defined so as to include tablet J in accommodation space K10. In the first exemplary embodiment, dimension D4 in front-rear direction L of accommodation space K10 is larger than diameter D0 (Fig. 10A and Fig. 10B) of tablet J. Accommodation space K10 has a vertically long shape that is long in front-rear direction L in plan view viewed from the vertical direction. In the first exemplary embodiment, the short direction of accommodation space K10 is horizontal (width direction K). Specifically, dimension D4 in front-rear direction L of accommodation space K10 is larger than dimension D6 in width direction K of accommodation space K10.

[0061] Water supply nozzles 12 and 13 of channel member 11 are formed on an upper portion of accommodation space K10. Accommodation space K10 may be provided immediately below water supply nozzles 12 and 13. Dimension D7 in the vertical direction of accommodation space K10 is larger than dimension D6 in width direction K of accommodation space K10. In the first exemplary embodiment, dimension D7 in the vertical direction of accommodation space K10 is equal to dimension D4 in front-rear direction L of accommodation space K10. Dimension D7 in the vertical direction may be larger than dimension D4 in front-rear direction L.

[0062] Furthermore, a plurality of projections 92 having a dot shape protruding in width direction K and applied to softener case 61 are formed on peripheral wall 81 around accommodation space K10. In the first exemplary embodiment, four projections 92 are formed and have a spherical shape. Four projections 92 are arranged so as to surround

accommodation space K10.

[0063] The end of front side L1 of peripheral wall 81 forms catcher 81a bent with respect to the front surface and protruding toward front side L1. The end of rear side L2 of peripheral wall 81 forms grip 81b bent with respect to the back surface and protruding toward rear side L2.

[0064] Catcher 81a and grip 81b are caught by a wall defining space 67 (Fig. 5). Furthermore, when removing tablet case 63 from body 64, the user can lift tablet case 63 by holding grip 81b. Grip 81b may be provided with a pattern so that the user can easily recognize that grip 81b is a member that can be held. In the first exemplary embodiment, protrusion 81c extending linearly is formed on the upper surface of grip 81b.

[0065] As illustrated in Fig. 9C, protrusion 87 is provided at a position separated with gap R1 in front-rear direction L from the lower end of inclined surface 84 between the lower end of inclined surface 84 and water supply position K1. Protrusion 87 is a member for guiding tablet J from inclined surface 84 to water supply position K1. Therefore, width D5 of gap R1 between protrusion 87 and inclined surface 84 is smaller than diameter D0 of tablet J. Protrusion 87 may be inclined downward toward rear side L2. Protrusion 87 may be formed along inclined surface 84, and is formed along an extension line of inclined surface 84, for example.

[0066] Protrusion 87 is separated from peripheral wall 81. Space R2 is formed below protrusion 87 between peripheral wall 81 and protrusion 87.

[0067] Protrusion 88 is provided at a position at an interval from the lower end of protrusion 87 between protrusion 87 and water supply position K1. Protrusion 88 functions as a holder holding tablet J in accommodation space K10. Therefore, protrusion 88 is provided at a height less than or equal to diameter D0 of tablet J from bottom wall 86. Protrusion 88 may extend in the up-down direction. Such a structure makes it easy to stably hold tablet J in accommodation space K10 as compared with the case where protrusion 88 extends in front-rear direction L.

[0068] Protrusion 88 is separated from peripheral wall 81 and is provided at a position above bottom wall 86 with gap R3. Therefore, space R2 below protrusion 87 and accommodation space K10 communicate with each other through gap R3 below protrusion 88. By providing gap R3, the water supplied to accommodation space K10 flows into space R2 and is drained through mesh 82 provided in space R2. Therefore, it is possible to suppress a rise in the water level in tablet case 63. Furthermore, gap R1 is provided

between inclined surface 84 and protrusion 87. Even if the water level rises and water rides on protrusion 87, the water can be dropped into space R2 through gap R1. Therefore, it is possible to suppress water from pushing up a fragment of tablet J onto inclined surface 84. As compared with the case where inclined surface 84 and protrusion 87 are continuous, the area of inclined surface 84 and protrusion 87 can be reduced, and fragments of tablet J can be suppressed from remaining on inclined surface 84 or protrusion 87.

[0069] In peripheral wall 81, inclined surface 84, vertical wall 85, and bottom wall 86 are gently connected. The corner between vertical wall 85 and bottom wall 86 has a curvature. Therefore, as compared with the case where the corner has a small curvature, fragments of tablet J are less likely to be clogged at the corner, and tablet J can be suppressed from remaining undissolved.

[0070] As illustrated in Fig. 9D, peripheral wall 81 protrudes from side wall 80 toward outer wall 89 of softener case 61. Therefore, outer wall 89 forms the other side wall of tablet case 63. Side wall 80 and outer wall 89 face each other. On the other hand, when tablet case 63 is removed from body 64, outer wall 89 is left in body 64, and therefore, the facing state between side wall 80 and outer wall 89 is automatically released. By releasing the facing state, the inner wall of tablet case 63 can be easily accessed, and the inner wall of tablet case 63 can be easily washed and maintained.

[0071] The dimension in width direction K of peripheral wall 81 is smaller than the dimension in front-rear direction L of side wall 80. That is, width direction K in which peripheral wall 81 protrudes is the short direction of tablet case 63, and the depth from the side wall opening facing side wall 80 to the inner wall surface of side wall 80 is shallow. Such a structure makes it easier to access the inner wall surface of side wall 80 and to perform maintenance. Mesh 82 is provided on the inner wall surface of side wall 80 to face the side wall opening. Therefore, mesh 82 can be easily accessed through the side wall opening, and maintenance such as washing becomes easy.

[0072] Protrusions 83a and 83b hit the upper portion of outer wall 89. Protrusions 83a and 83b push back outer wall 89 even if outer wall 89 bulges outward when body 64 is molded. In other words, protrusions 83a and 83b have a function of correcting the shape of softener case 61. Such a structure can secure a space inside tablet case 63. By forming protrusions 83a and 83b near the center of tablet case 63, it is possible to correct deflection of softener case 61 over a wider range as compared with the case where protrusions 83a and 83b are provided at the end in front-rear direction L of tablet case 63. Softener case 61

is long in front-rear direction L when molded with resin, and thus tends to bulge in width direction K, but by providing protrusions 83a and 83b, a component molded with resin is more suitably used.

[0073] Projection 92 also hits on outer wall 89. Therefore, gap R4 is formed between peripheral wall 81 and outer wall 89 of softener case 61. With such a structure, water is drained from between peripheral wall 81 and outer wall 89. By providing peripheral wall 81 with gap R4, it is possible to provide a drain path other than mesh 82, and perform drain even when mesh 82 is clogged. By providing gap R4 in peripheral wall 81, it is possible to easily manufacture tablet case 63 as compared with the case where bottom wall 86 is provided with the gap. Dimension D6 in width direction K of gap R4 may be smaller than the opening size of mesh 82. With such a structure, even when water passes through gap R4, the function of mesh 82 as a filter is not impaired.

[0074] Since projection 92 has a spherical shape, a contact area with softener case 61 can be reduced, and friction between tablet case 63 and softener case 61 can be reduced. Therefore, tablet case 63 can be easily removed.

[0075] When protrusion 83a hits outer wall 89, as illustrated in Fig. 9A, protrusion 83a divides the opening of the upper portion of tablet case 63 into input port 63a on front side L1 and opening 63b on rear side L2. Opening 63b is positioned above accommodation space K10. Input port 63a is an opening for inputting tablet J, and opening 63b is an opening for filling water from water supply nozzles 12 and 13 into tablet J. In addition, opening 63b is also an opening for confirming whether or not tablet J is input.

[0076] Returning to Fig. 3, when body 64 is pulled out from unit case 50, input port 63a is exposed over the entire surface. Input port 63a may have a vertically long shape, that is, width D2 of input port 63a may be smaller than length D3 in front-rear direction L of input port 63a. On the other hand, when body 64 is pulled out from unit case 50, opening 63b is partially exposed. By viewing the inside of tablet case 63 through opening 63b, the user can check whether or not tablet J has already been input. The opening size of opening 63b that is exposed may be smaller than the outer shape size of tablet J.

[0077] As illustrated in Figs. 9A and 9B, mesh 82 may be constituted by ribs 82a and 82b extending in two intersecting directions. In the first exemplary embodiment, mesh 82 includes a plurality of ribs 82a (Fig. 9A) extending in the lateral direction (front-rear direction L) and a plurality of ribs 82b (Fig. 9B) extending in the longitudinal direction.

[0078] In mesh 82, rib 82a extending in the lateral direction forms the inner wall of tablet

case 63, and rib 82b extending in the longitudinal direction forms the outer wall of tablet case 63. Since the supplied water is first applied to rib 82a extending in the lateral direction, the water becomes less likely to flow downward, and more water is ejected to the outside of tablet case 63 through mesh 82. Therefore, the water level in tablet case 63 can be maintained low. It is possible to suppress water from overflowing from tablet case 63 and water containing fragments of tablet J from overflowing from the opening such as input port 63a in the upper portion of tablet case 63. Furthermore, due to the low water level, it is possible to suppress fragments of tablet J from drifting onto the upper portion of tablet case 63 and remaining in tablet case 63 without being dissolved.

[0079] As illustrated in Figs. 10A and 10B, tablet J has a disk shape, and has diameter D0 and thickness T0. Fig. 10A illustrates a posture in which tablet J is vertically placed with the thickness direction orthogonal to input direction A2. Fig. 10B illustrates a posture in which tablet J is horizontally placed with the thickness direction parallel to input direction A2. The vertically placed posture is a posture in which the dimension in the vertical direction is larger than the dimension in a short direction (e.g., in the thickness direction) of tablet J in a horizontal cross section. In order to accommodate vertically placed tablet J in accommodation space K10, dimension D7 in the vertical direction of accommodation space K10 is larger than dimension D6 in width direction K, and dimension D4 in front-rear direction L of accommodation space K10 is also larger than dimension D6 in width direction K (Fig. 9A). In order to accommodate vertically placed tablet J in accommodation space K10 by effectively utilizing the space, dimension D4 in front-rear direction L of accommodation space K10 is substantially identical to diameter D0 of tablet J, and dimension D6 in width direction K is substantially identical to thickness T0 of tablet J. Furthermore, the vertically placed posture is a posture in which a movable contour is in contact with a placement surface. In the exemplary embodiment, tablet J moves along the outer periphery, and the posture in which the outer periphery of tablet J is in contact with the placement surface is the vertically placed posture.

[0080] In the first exemplary embodiment, width D2 of input port 63a is smaller than diameter D0 of tablet J and larger than thickness T0 of tablet J. Length D3 of input port 63a is larger than diameter D0 of tablet J. Therefore, tablet J passes through input port 63a in the vertically placed posture. In other words, tablet J is less likely to pass through input port 63a in the horizontally placed posture.

[0081] In order to input and accommodate vertically placed tablet J into tablet case 63

while effectively utilizing the space in width direction K, width D2 of input port 63a is substantially the same in size as thickness T0 of tablet J. That is, width D2 of input port 63a and dimension D6 (Fig. 9A) in width direction K of accommodation space K10 are substantially identical to each other.

[0082] As illustrated in Fig. 9C, when vertically placed tablet J is input to input port 63a, tablet J rolls on inclined surface 84 and protrusion 87 and reaches water supply position K1. Therefore, tablet J is held in accommodation space K10 by the arrangement of protrusion 88.

[0083] When tablet J is disposed in accommodation space K10, tablet J is dissolved by the water supplied from water supply nozzles 12 and 13 (Fig. 12).

[0084] Here, water supply to tablet J will be described.

[0085] Fig. 11 is a top view of laundry agent supply unit 5 in a state where lid 50a is removed. As illustrated in Fig. 11, three water supply valves 10a, 10b, and 10c (Fig. 3) of water supply member 10 are connected to paths F1, F2, and F3, respectively, of channel member 11. Paths F1, F2, and F3 are formed independently of one another. Path F1 connected to water supply valve 10a forms a channel for supplying water to detergent case 60 and powdery detergent case 62. Path F2 connected to water supply valve 10b forms a channel for supplying water to softener case 61 and tablet case 63. Path F3 connected to water supply valve 10c forms a channel for supplying water to automatic input unit 7. By supplying water to a plurality of cases through one path, the number of water supply valves in water supply member 10 can be reduced to simplify the configuration.

[0086] Path F2 forms openings 14 and 15 facing tablet case 63 and a plurality of openings 16 facing softener case 61. When water supply valve 10b is opened and communicates with path F2, water flows into tablet case 63 through openings 14 and 15 (see arrow B). On the other hand, water having exceeded openings 14 and 15 then flows into softener case 61 through opening 16.

[0087] Fig. 12 is a sectional view of laundry agent supply unit 5. As illustrated in Fig. 12, the upper portion of tablet case 63 is provided with water supply nozzle 12 extending downward from opening 14 and water supply nozzle 13 extending downward from opening 15. Water supply nozzles 12 and 13 are cylindrical members and form internal channels 26 and 27. Therefore, the water flowed into openings 14 and 15 is discharged to the inside of tablet case 63 through internal channels 26 and 27.

[0088] Water supply nozzles 12 and 13 are provided above water supply position K1 side

by side in front-rear direction L. More specifically, water supply nozzles 12 and 13 are provided at positions facing water supply position K1.

[0089] Fig. 13 is an enlarged perspective view of water supply nozzles 12 and 13. Fig. 14A is a sectional view of water supply nozzle 12. Fig. 14B is a sectional view of water supply nozzle 13.

[0090] As illustrated in Fig. 13, water supply nozzles 12 and 13 have similar shapes, and discharge openings 24 and 25 for discharging water are formed at lower ends of water supply nozzles 12 and 13, respectively. Discharge openings 24 and 25 are inclined in a direction deviated from the vertical direction. In other words, the plane passing through discharge openings 24 and 25 is inclined with respect to the horizontal. Discharge opening 24 is inclined in a direction opposite to discharge opening 25.

[0091] As illustrated in Fig. 14A, internal channel 26 of water supply nozzle 12 includes straight channel 26a and end channel 26b. Straight channel 26a extends downward from opening 14. End channel 26b extends to be inclined with respect to the up-down direction from the lower end of straight channel 26a to discharge opening 24. That is, central axis C1 of end channel 26b is inclined with respect to the vertical direction.

[0092] In the first exemplary embodiment, the cross section of end channel 26b is narrowed from the upstream toward discharge opening 24, and the cross section of end channel 26b is formed in a tapered shape. Therefore, the water passing through end channel 26b flows so as to gather on central axis C1, and is easily discharged from discharge opening 24 in a direction along central axis C1 (obliquely downward).

[0093] As illustrated in Fig. 14B, internal channel 27 of water supply nozzle 13 includes straight channel 27a and end channel 27b, similarly to internal channel 26 of water supply nozzle 12. End channel 27b of water supply nozzle 13 is inclined in a direction opposite to end channel 26b of water supply nozzle 12. Therefore, central axis C2 of end channel 27b is inclined in a direction opposite to central axis C1. With such a structure, the water discharged from discharge opening 25 is discharged to the side opposite to the water discharged from discharge opening 24. This enables tablet J to be wetted more uniformly from both sides. The inclination angles of end channel 26b and end channel 27b may be the same.

[0094] Fig. 15A is a schematic sectional view of tablet case 63 as viewed in front-rear direction L. Fig. 15B is a sectional view of a part of laundry agent supply unit 5.

[0095] As illustrated in Fig. 15A, end channels 26b and 27b (Fig. 14A and Fig. 14B) of

respective water supply nozzles 12 and 13 extend toward a position shifted with respect to water supply position K1. Specifically, end channels 26b and 27b extend toward a position on side wall 80 surrounding water supply position K1 and outer wall 89 of softener case 61. Therefore, water is discharged obliquely downward from water supply nozzle 12 toward side wall 80 of tablet case 63 (arrow W1). Water is discharged obliquely downward in the opposite direction from water supply nozzle 13 toward the outer wall of softener case 61 on the opposite side (arrow W2).

[0096] Water is applied to point P1 on side wall 80 and point P2 on outer wall 89 of softener case 61 and flows downward along the wall surface. Points P1 and P2 are positioned on mesh 82 above the top of tablet J and above accommodation space K10. Water collides with side wall 80 at points P1 and P2, whereby the flow velocity of the water can be reduced. After the collision, when the water flows downward along the wall surface, the water is applied to the side surface of tablet J and is absorbed by tablet J. Since the water collides with side wall 80 once and then indirectly hits the side surface of tablet J, the momentum of the water applied to tablet J can be reduced as compared with the case where the water is directly applied to tablet J from water supply nozzles 12 and 13.

[0097] After the collision, part of the water flowing downward passes through mesh 82 and flows out from tablet case 63. Therefore, the amount of water reaching tablet J can be reduced, and the momentum of water can be further reduced.

[0098] Part of water may be applied to tablet J by splash from the wall surface.

[0099] As illustrated in Fig. 15B, the height of outer wall 89 of softener case 61 is lower than the height of side wall 80. The distal ends of water supply nozzles 12 and 13 are higher than the upper portion of outer wall 89 and lower than the upper portion of side wall 80.

[0100] Channel member 11 is provided with protrusion 11a protruding toward catcher 80a below outside tablet case 63. Therefore, a labyrinth structure is formed by protrusion 11a and side wall 80. This structure suppresses water from flowing from detergent case 60 to tablet case 63 at the timing when detergent case 60 is supplied with water through path F1. Similarly, water is suppressed from flowing from tablet case 63 to detergent case 60 at the timing when tablet case 63 is supplied with water through path F2.

[0101] Since softener case 61 is supplied with water at the same timing as tablet case 63, the labyrinth structure needs not be formed by the upper portion of outer wall 89.

[0102] [Operation]

Subsequently, the operation of washing machine 1 when executing the sterile filtration course will be described with reference to Fig. 15C. Fig. 15C is a sequence diagram of the sterile filtration course.

[0103] The sterile filtration course means a washing course performed for removing bacteria adhering to clothes and towels. One tablet J is used in one sterile filtration course. After the end of the sterile filtration course, it is assumed that tablet J does not remain in tablet case 63 in the same shape as before the input. Therefore, the user inputs new tablet J into tablet case 63 prior to the next sterile filtration course.

[0104] As illustrated in Fig. 15C, the sterile filtration course includes a washing process, a first rinsing process, a second rinsing process, and a spin-drying process. In the washing process, a detergent is supplied to washing tub 4, and in the rinsing process, another liquid agent, tablet, and the like are supplied to washing tub 4. In the first exemplary embodiment, tablet J is supplied to washing tub 4 in the first rinsing process. When a softener is also supplied, the softener is supplied to washing tub 4 in the second rinsing process.

[0105] First, the user inputs the detergent and one tablet J for one sterile filtration course into manual input unit 6. The user inputs tablet J into input port 63a. Input port 63a is not positioned in the vicinity of the end of manual input unit 6, and input port 63a is between input port 65a and input port 66a. Therefore, even if tablet J is erroneously dropped from the hand, it is possible to suppress tablet J from directly dropping into washing tub 4.

[0106] Furthermore, by providing detergent case 60 and softener case 61 on the left and right of input port 63a with the restrictors (guides 68 and 168), even if tablet J is erroneously dropped from the hand to the left and right of input port 63a, tablet J is caught by any of left and right guides 68 and 168. Therefore, erroneous input to detergent case 60 or softener case 61 can be prevented, and tablet J can be more reliably input to tablet case 63. When tablet J is input to input port 63a, tablet J rolls to rear side L2 along inclined surface 84, and is more reliably disposed at water supply position K1 (i.e., accommodation space K10).

[0107] On the other hand, the detergent may be automatically input by automatic input unit 7.

[0108] <Washing process>

In the washing process, controller C opens water supply valve 10a to supply water to path F1. Water flows into detergent case 60 through path F1, and is supplied to washing

tub 4 together with the detergent accommodated in detergent case 60. Controller C agitates washing tub 4 to execute washing of the laundry.

[0109] <First rinsing process>

Subsequently, in the first rinsing process, controller C drains water in washing tub 4 including detergent, and supplies new water to washing tub 4 through path F1. Controller C supplies water until the water level of washing tub 4 reaches a first predetermined water level. The first predetermined water level is a water level assumed to be necessary for soaking laundry in water. The first predetermined water level may be calculated by controller C in accordance with the weight of the laundry acquired in advance. For example, the first predetermined water level is a water level at which the bath ratio is 10 L/kg in accordance with the weight of the laundry calculated by controller C.

[0110] Subsequently, controller C closes water supply valve 10a, opens water supply valve 10b, and supplies path F2 with a small water supply amount (hereinafter, preliminary water supply step). Water flows into tablet case 63 through path F2 and is indirectly applied to tablet J as illustrated in Fig. 15A. The small water supply amount means the water supply amount that is insufficient to dissolve tablet J and cause tablet J to flow out from tablet case 63 while wetting the surface of tablet J.

[0111] Here, the water supply amount in the preliminary water supply step is smaller than the water supply amount in the subsequent main water supply step. In the preliminary water supply step, the small water supply amount supplied from water supply valve 10b may be from 400 mL to 2500 mL inclusive of water supply, and desirably from 400 mL to 1250 mL inclusive of water supply. The flow rate of the water supplied by water supply valve 10b may be from 5 L/min to 15 L/min inclusive. About 15% of the water supplied from water supply valve 10b is distributed to tablet case 63, and for example, from 50 mL to 200 mL inclusive of water flows into tablet case 63. For example, when water is supplied at 12 L/min for 5 seconds and 1000 mL of water is supplied from water supply valve 10b, 140 mL of water flows into tablet case 63. The water supply time may be less than 10 seconds, and desirably may be approximately 5 seconds.

[0112] Subsequently, after the preliminary water supply step, controller C closes water supply valve 10b and starts standby time. The standby time is a time during which the water supply from water supply valve 10b to path F2 is stopped. For example, the standby time is greater than or equal to 20 seconds.

[0113] By providing the standby time, it is possible to secure a time for wet tablet J to

foam in the preliminary water supply step. It is possible to secure a time for the preliminarily supplied water to further permeate the inside from the surface of tablet J. Tablet J having foamed or tablet J having water permeated inside thereof is easily soluble in water. By performing the main water supply step on tablet J that is easily soluble, tablet J can be easily and completely dissolved as compared with the case of performing the main water supply step immediately.

[0114] In the standby time, drain, water supply using other paths F1 and F3, or agitation of washing tub 4 may be performed. In the first exemplary embodiment, in the standby time, controller C supplies water through path F1 until the water level of washing tub 4 reaches a second predetermined water level. The second predetermined water level may be higher than the first predetermined water level.

[0115] Subsequently, controller C opens water supply valve 10b to supply path F2 with water (hereinafter, main water supply step). Water flows into tablet case 63 through path F2 and is indirectly applied to tablet J as illustrated in Fig. 15A. Since the water supply amount is larger than that in the preliminary water supply step, tablet J is dissolved. Tablet J having been dissolved is supplied to washing tub 4 through mesh 82 together with water.

[0116] The water supply amount in the main water supply step may be 30 L of water supply, or may be water supply for greater than or equal to 120 seconds, and is, for example, 30 times the water supply amount in the preliminary water supply.

[0117] <Second rinsing process>

Subsequently, in the second rinsing process, controller C drains the water in washing tub 4 including tablet J having been dissolved, supplies new water to washing tub 4 through path F2, and agitates washing tub 4. In the first exemplary embodiment, a softener is supplied in the second rinsing process. The softener is supplied not by manual input unit 6 but by automatic input unit 7. Since softener case 61 for manual input shares path F2 with tablet case 63, when the softener is to be supplied by manual input unit 6, it is difficult to separately supply the softener and the tablet, and there is a risk that the softener and tablet J are mixed. Mixing of the softener and tablet J makes it difficult for the tablet to exhibit an ideal effect. On the other hand, if the softener and tablet J can be separately provided, tablet J can be supplied to washing tub 4 in the first rinsing process, and the softener can be supplied to washing tub 4 in the final rinsing process (i.e., the second rinsing process). After tablet J is supplied in the first rinsing process, the laundry can be rinsed in the second rinsing process, and thus adhesion of tablet J to the laundry can be

further suppressed. Since the process can proceed to the spin-drying process immediately after the softener is supplied to washing tub 4, the components and aroma adhering to the laundry are maintained as compared with the case where the rinsing process is provided after the supply. Therefore, controller C supplies the softener by automatic input unit 7.

[0118] <Spin-drying process>

Subsequently, in the spin-drying process, the water in washing tub 4 is drained to perform spin-drying of the laundry.

[0119] By repeating the above operation, undissolved remains of tablet J may accumulate in tablet case 63. Therefore, it is necessary to remove tablet case 63 from washing machine 1 and maintain tablet case 63.

[0120] First, laundry agent supply unit 5 is removed from washing machine 1.

[0121] With protrusion 81c of grip 81b as a mark, the position of grip 81b is recognized, and a finger is put on grip 81b to lift tablet case 63 from body 64.

[0122] When tablet case 63 is taken out, the facing state between side wall 80 and outer wall 89 is released, and the inner wall of tablet case 63 is exposed and can be easily accessed by the user. The inner wall of tablet case 63 is washed with water. The undissolved remains of tablet J adhering to the inner wall may be scraped off using a tool such as a brush. Here, the portion where the undissolved remains of tablet J are likely to be generated is mesh 82 around accommodation space K10, bottom wall 86 at water supply position K1, inclined surface 84 with which tablet J comes into contact, protrusion 87, and protrusion 88. When the undissolved remains of tablet J are generated on mesh 82, the opening of mesh 82 is blocked, and the drainage property of tablet case 63 may be deteriorated. However, in the present disclosure, since the facing state between side wall 80 and outer wall 89 can be released to access the inner wall of tablet case 63, mesh 82 can be easily washed to remove tablet J.

[0123] [Summary]

The above description is summarized to describe features of the present disclosure.

[0124] Washing machine 1 according to the first exemplary embodiment includes the tablet case for manually inputting tablet J for sterile filtration, and the detergent case and the softener case for manually inputting the liquid agent.

[0125] Since tablet J is a solid treatment agent, tablet J is highly likely to remain in the case without being completely dissolved in water as compared with the liquid agent or the

powdery detergent. When tablet J remains in the case, tablet J used for sterile filtration of the laundry is reduced, and the sterile filtration performance of tablet J for the laundry is deteriorated. Therefore, it is required to dissolve tablet J by appropriately supplying water.

[0126] In order to appropriately supply water, it is required to input tablet J to tablet case 63 without fail. On the other hand, since the cases are adjacent to each other due to space saving of manual input unit 6, there is a risk that the user erroneously inputs tablet J into detergent case 60 or softener case 61. In this case, there is a possibility that tablet J is supplied to washing tub 4 at a wrong timing and damages the clothes.

[0127] Therefore, since input ports 65a and 66a of detergent case 60 and softener case 61 are smaller than tablet J, tablet J can be suppressed from reaching the bottom of the case even when the user erroneously inputs tablet J to a wrong input destination. Therefore, the user can easily take out tablet J from the wrong input destination and input again tablet J into correct input port 63a.

[0128] When tablet J is input to tablet case 63, tablet J can pass through input port 63a in the vertically placed posture, but is less likely to pass through input port 63a in the horizontally placed posture. Such a configuration enables tablet J to roll and move in tablet case 63. Therefore, it is easy to roll tablet J on inclined surface 84 and protrusion 87 and guide tablet J to accommodation space K10. Protrusion 88 is held so as not to roll away from accommodation space K10. Such a structure enables tablet J to receive appropriate water supply in accommodation space K10.

[0129] It is possible to make it easy to dispose and hold tablet J in accommodation space K10 and indirectly apply water to tablet J in accommodation space K10. Specifically, the water can be indirectly applied to tablet J by directing end channels 26b and 27b of water supply nozzles 12 and 13 toward the wall surface surrounding accommodation space K10. Therefore, as compared with the case where water is directly applied to tablet J, it is possible to suppress fragments from scattering from tablet J and adhering to the upper portion of tablet case 63. Since it is difficult to wash off fragments adhering to the upper portion of tablet case 63, fragments may remain in tablet case 63. Therefore, by indirectly applying water to tablet J while sufficiently supplying water by such a water supply structure, the ratio of part to be supplied to washing tub 4 in one tablet J is increased, and the sterile filtration performance is stabilized.

[0130] Furthermore, in the water supply sequence, after tablet J is brought into a soluble state by performing the preliminary water supply step, the main water supply step is

performed. Therefore, remaining of tablet J in tablet case 63 can be further suppressed.

[0131] Even when the undissolved remains of tablet J are generated in tablet case 63, the undissolved remains can be removed because maintenance of tablet case 63 having the one-side open structure is easy. By configuring one side wall of tablet case 63 by softener case 61, it is possible to expose the inner wall of side wall 80 and wash off the undissolved remains of tablet J accumulated therein only by removing tablet case 63 from body 64.

Therefore, the undissolved remains of tablet J are suppressed from blocking mesh 82 and the like and hindering passage of tablet J, and the ratio of part to be supplied to washing tub 4 in one tablet J is further increased, and the sterile filtration performance is stabilized. Furthermore, tablet J having sterile filtration performance can be also suppressed from remaining in tablet case 63 for a long period of time and adversely affecting tablet case 63.

[0132] With the one-side open structure, the dimension in width direction K of tablet case 63 can be reduced. Therefore, tablet case 63 can be configured in a limited space, and space saving of laundry agent supply unit 5 can be achieved.

[0133] [Effect 1]

Washing machine 1 according to the first exemplary embodiment can achieve the following effects.

[0134] As described above, washing machine 1 of the present exemplary embodiment includes washing tub 4 rotatably provided in housing 2, and laundry agent supply unit 5 that supplies washing tub 4 with laundry agent. Laundry agent supply unit 5 includes detergent case 60 (first laundry agent case), softener case 61 (second laundry agent case), and tablet case 63 (solid agent case). Detergent case 60 is provided with input port 65a (first laundry agent input port) through which detergent (first laundry agent) is input, and accommodates and supplies, to washing tub 4, the detergent. Softener case 61 is provided with input port 66a (second laundry agent input port) through which softener (second laundry agent) different from detergent is input, and accommodates and supplies, to washing tub 4, the softener. Tablet case 63 is provided with input port 63a (solid agent input port) into which tablet J (solid agent) is input, and accommodates and supplies, to washing tub 4, the tablet J. Input port 63a is disposed between input port 65a and input port 66a.

[0135] With such a configuration, by disposing input port 63a between input port 65a and input port 66a, even if the user accidentally drops tablet J in an upside of input port 63a, tablet J is caught by detergent case 60 or softener case 61. Therefore, it is possible to

suppress tablet J from being supplied to washing tub 4 at a timing not intended by the manufacturer of washing machine 1.

[0136] Washing machine 1 of the present exemplary embodiment is a washing machine in which the rinsing process is executed in a state where tablet case 63 accommodates tablet J or in a state where softener case 61 accommodates the softener after the washing process. Softener case 61 is configured to be able to supply the accommodated softener to washing tub 4 in the rinsing process. Tablet case 63 is provided adjacent to softener case 61.

[0137] Such a configuration provides specifications in which tablet J is supplied in place of the liquid agent (i.e., the softener) normally supplied in the rinsing process from manual input unit 6, path F2 can be shortened by being adjacent to softener case 61.

[0138] In washing machine 1 of the present exemplary embodiment, tablet case 63 includes accommodation space K10 defined at least by side wall 80 (wall surface) of tablet case 63. Dimension D6 (width) in width direction K (short direction) of accommodation space K10 is substantially the same as width D2 in the width direction of input port 63a.

[0139] Such a configuration can achieve space saving in width direction K of tablet case 63. Therefore, path F2 can be shortened and the efficiency can be improved. Since dimension D6 of accommodation space K10 and width D2 of input port 63a are substantially the same in size, when tablet J has a disk shape, tablet J is input in the vertically placed posture and accommodated with the vertically placed posture maintained.

[0140] In washing machine 1 of the present exemplary embodiment, detergent case 60, tablet case 63, and softener case 61 are disposed adjacent in width direction K (one direction). Tablet case 63 is provided such that width direction K is the short direction of tablet case 63.

[0141] Such a configuration can provide tablet case 63 without unnecessarily increasing the sectional area of the horizontal plane of laundry agent supply unit 5.

[0142] In washing machine 1 of the present exemplary embodiment, input port 63a has a vertically long shape that is long in a direction orthogonal to width direction K.

[0143] With such a configuration, when tablet J has a disk shape, tablet J can be smoothly input in the vertically placed posture.

[0144] In washing machine 1 of the present exemplary embodiment, laundry agent supply unit 5 is configured to be drawable from the body of washing machine 1. Tablet case 63 includes accommodation space K10 accommodating tablets and opening 63b (opening)

provided in the upper portion of tablet case 63. Opening 63b exposes accommodation space K10 in a state where laundry agent supply unit 5 is drawn out from the body of washing machine 1.

[0145] Such a configuration allows the inside of accommodation space K10 to be visually recognized from opening 63b in a state where laundry agent supply unit 5 is pulled out. Therefore, it is possible to prevent the user from wrongly inputting a plurality of tablets J.

[0146] In washing machine 1 of the present exemplary embodiment, tablet case 63 includes inclined surface 84 (guide) guiding tablet J from input port 63a to accommodation space K10. Opening 63b is provided above accommodation space K10.

[0147] With such a configuration, tablet J is more reliably input to accommodation space K10, and can be visually recognized from opening 63b.

[0148] Washing machine 1 of the present exemplary embodiment includes washing tub 4 rotatably provided in housing 2, and laundry agent supply unit 5 that supplies laundry agent to washing tub 4. Laundry agent supply unit 5 includes detergent case 60 (first laundry agent case) and tablet case 63 (solid agent case). Detergent case 60 is provided with input port 65a (first laundry agent input port) through which detergent (first laundry agent) is input, and accommodates and supplies, to washing tub 4, the detergent. Tablet case 63 is provided with input port 63a (solid agent input port) into which tablet J (solid agent) that is water-soluble is input, and accommodates and supplies, to washing tub 4, tablet J. Detergent case 60 is provided with accommodation space 77 (laundry agent accommodation space) accommodating detergent and guide 68 (restrictor) restricting passage of tablet J.

[0149] Such a configuration can suppress erroneous input of tablet J into input ports 65a and 66a. Even when tablet J is erroneously input, tablet J is less likely to pass through input ports 65a and 66a. Therefore, tablet J having been erroneously input is easily taken out, and tablet J is easily input again to the correct place. By inputting again, tablet J reaches accommodation space K10 and can receive water supply at an appropriate timing.

[0150] In washing machine 1 of the present exemplary embodiment, opening size D1 (width dimension of the maximum width) of input port 65a is smaller than dimension D3 of input port 63a in the long direction.

[0151] Such a configuration can restrict tablet J from passing through input port 65a.

[0152] In washing machine 1 of the present exemplary embodiment, guide 68 (wall) defining input port 65a functions as a restrictor.

[0153] Such a configuration can easily restrict tablet J from passing through input port 65a by adjusting opening size D1 of input port 65a without separately providing a restrictor.

[0154] Washing machine 1 of the present exemplary embodiment further includes softener case 61 (second laundry agent case) provided with input port 66a (second laundry agent input port) through which a softener (second laundry agent) is input, and accommodates and supplies, to washing tub 4, the softener. Input port 63a is disposed between detergent case 60 and softener case 61.

[0155] With such a configuration, a space between detergent case 60 and softener case 61 can be effectively utilized. It is difficult to drop tablet J into washing tub 4 as compared with the case where input port 63a is disposed outside detergent case 60 or softener case 61.

[0156] In washing machine 1 of the present exemplary embodiment, input port 63a is disposed between guide 68 (wall) provided in detergent case 60 and guide 168 (wall) provided in softener case 61.

[0157] With such a configuration, since input port 63a is disposed between guide 68 and guide 168, tablet J erroneously dropped in the vicinity of input port 63a is easily caught on guides 68 and 168.

[0158] In washing machine 1 of the present exemplary embodiment, tablet case 63 includes accommodation space K10 accommodating tablet J in a holding state. Dimension D6 (width) in width direction K of accommodation space K10 is substantially the same in size as width D2 in width direction K of input port 63a.

[0159] With such a configuration, width D2 in width direction K of input port 63a can be made substantially the same in size as thickness T0 of tablet J, and tablet J can be input and accommodated in the vertically placed posture. Since tablet J can be input only in a predetermined posture, the user can be guided to carefully input tablet J.

[0160] [Effect 2]

Washing machine 1 of the present exemplary embodiment is washing machine 1 configured to which tablet J (solid agent) that is water-soluble and single-use can be input, and includes washing tub 4, tablet case 63 (solid agent case), and water supply nozzles 12 and 13 (water feeder). Washing tub 4 is rotatably provided in housing 2. Tablet case 63 includes accommodation space K10 accommodating tablet J. Water supply nozzles 12 and 13 include discharge openings 24 and 25 through which water flows out, and supply water

into tablet case 63 through discharge openings 24 and 25. Water supply nozzles 12 and 13 fill water toward side wall 80 and outer wall 89 (inner wall surface) defining accommodation space K10.

[0161] Such a configuration can reduce water discharged from water supply nozzles 12 and 13 and directly applied to tablet J. Therefore, it is possible to suppress fragments from scattering from tablet J and to suppress the fragments from adhering to a portion where water is less likely to reach of the inside of tablet case 63. Therefore, it is possible to suppress fragments of tablet J from remaining in tablet case 63 after water supply and improve sterile filtration performance in washing machine 1.

[0162] In washing machine 1 of the present exemplary embodiment, accommodation space K10 is defined by a part of side wall 80 and a part of outer wall 89. Water supply nozzles 12 and 13 fill water toward side wall 80 and outer wall 89 more upward than accommodation space K10.

[0163] With such a configuration, tablet J adhering to side wall 80 and outer wall 89 can be washed off by the water discharged from water supply nozzles 12 and 13. Furthermore, with such a configuration, the water discharged from water supply nozzles 12 and 13 is applied to side wall 80 and outer wall 89 before tablet J is supplied with water, whereby the momentum of the water discharged from water supply nozzles 12 and 13 can be reduced.

[0164] In washing machine 1 of the present exemplary embodiment, dimension D6 (length) of a first side constituting width direction K (short direction) in the horizontal cross section of accommodation space K10 is less than or equal to dimension D7 (length) of a second side orthogonal in the vertical direction to the first side.

[0165] Such a configuration can reduce the sectional area in the horizontal direction of accommodation space K10 accommodating tablet J. Therefore, the water filled from water supply nozzles 12 and 13 is less likely to be directly applied to tablet J before applied to side wall 80 and outer wall 89. Tablet case 63 can be provided in a space-saving manner.

[0166] In washing machine 1 of the present exemplary embodiment, dimension D7 of the second side is greater than or equal to dimension D4 (length) of a third side constituting the long direction in the horizontal cross section of accommodation space K10. Water supply nozzles 12 and 13 fill water more upward than the second side of side wall 80 and outer wall 89.

[0167] Such a configuration enables tablet J to be brought into contact with water in the

long direction (i.e., the diameter direction) of tablet J, and therefore tablet J can be efficiently dissolved.

[0168] In washing machine 1 of the present exemplary embodiment, the inner wall surface includes a side wall 80 (first surface), which is an inner surface of tablet case 63. Side wall 80 is provided with mesh 82 (drain) having a plurality of water passing holes for ejecting water in tablet case 63. Water supply nozzles 12 and 13 fill water toward mesh 82.

[0169] Such a configuration can wash away tablet J adhering to mesh 82. With such a configuration, part of the water supplied from water supply nozzle 12 is ejected from mesh 82 before applied to tablet J.

[0170] In washing machine 1 of the present exemplary embodiment, the inner wall surface includes outer wall 89 (second surface) different from side wall 80. Water supply nozzles 12 and 13 include water supply nozzle 12 (first water feeder) that fills water toward mesh 82, and water supply nozzle 13 (second water feeder) that fills water toward outer wall 89.

[0171] Such a configuration can wash off tablet J adhering to the side walls on both sides surrounding accommodation space K10. As compared with the case where washing machine 1 includes only one water supply nozzle, water can be applied to tablet J to efficiently dissolve tablet J.

[0172] In washing machine 1 of the present exemplary embodiment, water supply nozzle 12 and water supply nozzle 13 are aligned in front-rear direction L (long direction in horizontal cross section of accommodation space K10).

[0173] Such a configuration can efficiently apply water to tablet J. Even when the space in width direction K is limited, two water supply nozzles 12 and 13 can be spatially efficiently arranged, water supply nozzles 12 and 13 do not get bulky, and tablet case 63 can be formed compactly.

[0174] In washing machine 1 of the present exemplary embodiment, tablet case 63 is provided with protrusion 88 (holder) holding tablet J in accommodation space K10.

[0175] Such a configuration enables tablet J to be held in accommodation space K10. Therefore, tablet J can be held at a position where the water is appropriately applied to tablet J. In other words, by providing protrusion 88, the space on rear side L2 of protrusion 88 is defined as accommodation space K10.

[0176] In washing machine 1 of the present exemplary embodiment, accommodation space K10 is positioned vertically below discharge openings 24 and 25.

[0177] Such a configuration can reduce the dimension in width direction K of tablet case 63 as compared with the case where end channels 26b and 27b are arranged at positions separated in width direction K from accommodation space K10. As compared with the case where end channels 26b and 27b are arranged at positions separated in front-rear direction L from accommodation space K10, the distance between end channels 26b and 27b and tablet J is reduced, and the water easily reaches tablet J.

[0178] Washing machine 1 of the present exemplary embodiment includes body 64 (case housing) accommodating softener case 61 (first laundry agent case) accommodating softener (first laundry agent) and tablet case 63, and path F2 (channel) that is provided on an upside of body 64 and supplies water into body 64. Tablet case 63 is provided adjacent to softener case 61.

[0179] With such a configuration, since tablet case 63 and softener case 61 are arranged close to each other, the path for supplying water to tablet case 63 and the path for supplying water to softener case 61 can be made common. Therefore, since the members into which a laundry agent is input can be put together in body 64, convenience of the user can be improved.

[0180] Washing machine 1 of the present exemplary embodiment includes water supply valve 10b (first water supply valve) that introduces water from outside. Water supply valve 10b supplies water to tablet case 63 and softener case 61.

[0181] With such a configuration, the structure of water supply member 10 can be simplified by sharing water supply valve 10b by tablet case 63 and softener case 61. Therefore, the manufacturing cost of washing machine 1 can be reduced.

[0182] In washing machine 1 of the present exemplary embodiment, tablet case 63 includes input port 63a for the user to input tablet J to tablet case 63. Tablet case 63 includes inclined surface 84 extending obliquely downward toward accommodation space K10 below input port 63a.

[0183] Such a configuration enables tablet J to be guided to water supply position K1 so that tablet J can receive appropriate water supply.

[0184] In washing machine 1 of the present exemplary embodiment, tablet case 63 includes vertical wall 85 (wall) extending downward from the lower end of inclined surface 84, and bottom wall 86 extending laterally from the lower end of vertical wall 85 and provided in a lower part of accommodation space K10.

[0185] Such a configuration can form a level difference in a lower part with respect to

inclined surface 84. Formation of the level difference can increase the volume of tablet case 63. Therefore, it is possible to suppress the rise of the water level of tablet case 63 and to reduce the possibility that a fragment of tablet J drifts onto inclined surface 84.

Therefore, it is possible to prevent tablet J from remaining on inclined surface 84.

[0186] In washing machine 1 of the present exemplary embodiment, tablet case 63 further includes protrusion 87 protruding from side wall 80 (wall surface) of tablet case 63 at a position at gap R1 (interval) from the lower end of inclined surface 84. Protrusion 87 is positioned between inclined surface 84 and accommodation space K10.

[0187] Such a configuration makes it easier to more reliably guide tablet J to accommodation space K10 while shortening inclined surface 84. Shortening of inclined surface 84 can prevent tablet J from remaining on inclined surface 84. Since gap R1 is provided between inclined surface 84 and protrusion 87, water can drop downward through gap R1, and thus water and fragments of tablet J are less likely to rise on inclined surface 84.

[0188] Washing machine 1 of the present exemplary embodiment is configured to which tablet J (solid agent) that is water-soluble and single-use can be input. Washing machine 1 includes washing tub 4, detergent case 60, tablet case 63 (solid agent case), water supply valve 10a (first water supply valve), water supply valve 10b (second water supply valve), and controller C. Washing tub 4 is rotatably provided in housing 2. Detergent case 60 accommodates detergent. Tablet case 63 accommodates tablet J. Water supply valve 10a supplies water to detergent case 60. Water supply valve 10b supplies water to tablet case 63. Controller C controls water supply valve 10a and water supply valve 10b to execute a wash process (first step). The wash process includes the preliminary water supply step, the standby step, and the main water supply step. In the preliminary water supply step, tablet J is supplied with water by water supply valve 10b. In the standby step, after the preliminary water supply step, the water supply by water supply valve 10b is stopped. In the main water supply step, after the standby step, water supply valve 10b supplies water to tablet J having been subjected to the preliminary water supply step. The water supply amount in the preliminary water supply step is smaller than the water supply amount in the main water supply step.

[0189] With such a configuration, prior to the main water supply step for dissolving tablet J, tablet J is wetted in the preliminary water supply step, foams in the standby time, and becomes easy to dissolve. Therefore, the main water supply step makes it easy to

completely dissolve tablet J. Therefore, it is possible to suppress tablet J not completely dissolved from remaining in tablet case 63 after the main water supply step.

[0190] In washing machine 1 of the present exemplary embodiment, the wash process includes the washing process of inputting detergent and at least two rinsing processes. The main water supply step is executed in the rinsing process one or more before the final rinsing process.

[0191] With such a configuration, by performing the rinsing process after the main water supply step in which tablet J is input, tablet J adhering to the laundry can be more reliably washed off. Therefore, color loss of laundry can be suppressed. When there are three or more rinsing processes, the rinsing process is performed between the process of inputting the detergent and the process of inputting tablet J, whereby it is possible to suppress the detergent remaining in washing tub 4 after the washing process from adversely affecting tablet J.

[0192] In washing machine 1 of the present exemplary embodiment, the water supply amount in the preliminary water supply step is less than 1/10 of the water supply amount in the main water supply step.

[0193] With such a configuration, in the preliminary water supply step, it is possible to suppress tablet J from being dissolved and flowing into washing tub 4.

[0194] In washing machine 1 of the present exemplary embodiment, the preliminary water supply step is executed in a state where the water level of washing tub 4 is equal to or higher than a predetermined water level.

[0195] With such a configuration, in the preliminary water supply step, even when tablet J is dissolved and flows into washing tub 4, it is possible to suppress tablet J from adhering to the laundry. Therefore, color loss of laundry can be suppressed.

[0196] [Effect 3]

Washing machine 1 of the present exemplary embodiment includes washing tub 4 rotatably provided in housing 2, and tablet case 63 (solid agent case) including accommodation space K10 (solid agent accommodation space) accommodating tablet J (solid agent) that is water-soluble and supplies, to washing tub 4, tablet J dissolved in water. Tablet case 63 is removably provided in housing 2. In a state where tablet case 63 is attached to housing 2, accommodation space K10 is defined by side wall 80 and outer wall 89 (wall surface) facing each other. In a state where tablet case 63 is removed from housing 2, the facing state between side wall 80 and outer wall 89 can be released.

[0197] With such a structure, when the facing state between side wall 80 and outer wall 89 is released, the inner surface of side wall 80 can be easily accessed, and accumulation of undissolved remains of tablet J can be easily washed off.

[0198] In washing machine 1 of the present exemplary embodiment, side wall 80 includes mesh 82 (drain) formed to allow water to pass therethrough.

[0199] With such a structure, by releasing the facing state between side wall 80 and outer wall 89, mesh 82 formed on side wall 80 can be easily accessed, and tablet J clogged in mesh 82 can be easily washed off.

[0200] In washing machine 1 of the present exemplary embodiment, side wall 80 and outer wall 89 face each other in width direction K (short direction) of accommodation space K10.

[0201] With such a structure, the depth from the opening generated by releasing the facing state to the inner surface of side wall 80 is small. Therefore, the user can easily reach the inner surface of side wall 80, and it is easy to maintain tablet case 63.

[0202] In washing machine 1 of the present exemplary embodiment, tablet case 63 forms input port 63a into which tablet J is input. Width D2 in width direction K of input port 63a is substantially the same as dimension D6 (width) in width direction K of accommodation space K10.

[0203] With such a structure, when the size of tablet J to be input is substantially the same as input port 63a, the wide surface of tablet J faces side wall 80. In side wall 80, the area that can come into contact with tablet J is large, and the undissolved remains of tablet J are likely to accumulate. By releasing the facing state of side wall 80, it is possible to wash away accumulation of more undissolved remains of tablet J.

[0204] In washing machine 1 of the present exemplary embodiment, tablet case 63 is disposed such that the short direction of accommodation space K10 is substantially horizontal.

[0205] Such a structure can provide a structure in which the inner surface of side wall 80 is easily accessed when the facing state is released, and furthermore can configure tablet case 63 to be small in the horizontal direction. Therefore, it is possible to effectively use the space in the horizontal direction while securing the maintainability.

[0206] In washing machine 1 of the present exemplary embodiment, tablet case 63 includes catcher 80a, catcher 81a, and grip 81b (catcher) that protrude outward from accommodation space K10.

[0207] With such a structure, by catching catcher 80a, catcher 81a, and grip 81b on body 64, the attachment position of tablet case 63 in body 64 can be maintained. By pulling grip 81b, the user can easily remove tablet case 63 from washing machine 1.

[0208] Washing machine 1 of the present exemplary embodiment further includes softener case 61 (laundry agent case) disposed adjacent to tablet case 63 and accommodating a softener (laundry agent) supplied to washing tub 4. Side wall 80 is formed of tablet case 63 and includes mesh 82 (drain) formed to allow water to pass therethrough. Outer wall 89 is configured of softener case 61.

[0209] With such a structure, the facing state between side wall 80 and outer wall 89 can be released only by removing tablet case 63 from washing machine 1.

[0210] In washing machine 1 of the present exemplary embodiment, tablet case 63 has peripheral wall 81 facing softener case 61. Peripheral wall 81 has a projection 92 protruding toward softener case 61.

[0211] With such a structure, gap R4 is provided between peripheral wall 81 and softener case 61, and the drainage property of tablet case 63 can be improved. Therefore, it is possible to suppress a rise in the water level of tablet case 63, and it is possible to suppress fragments of tablet J from drifting and remaining undissolved on the upper portion of tablet case 63.

[0212] In washing machine 1 of the present exemplary embodiment, path F2 (water supply path) between softener case 61 and tablet case 63 is common.

[0213] Such a structure can simplify the structure of path F2. In washing machine 1 having path F2, by providing automatic input unit 7, the softener can be supplied to washing tub 4 in the sterile filtration course.

[0214] The present disclosure is not limited to the above exemplary embodiments, and can be implemented in various other aspects. The following various other aspects may also be applied also to the second exemplary embodiment.

[0215] An example in which washing machine 1 is a top-loading-type washing machine has been described, but the present invention is not limited to this. For example, washing machine 1 may be a drum-type washing machine.

[0216] An example of using tablet J as the solid agent has been described, but the present invention is not limited to this.

[0217] An example in which tablet J contains a component exhibiting sterile filtration performance has been described, but the present invention is not limited to this. For

example, tablet J may contain components having various functionalities such as fragrance.

[0218] An example in which tablet J contains sodium dichloroisocyanurate has been described, but the present invention is not limited to this. Tablet J may contain other dichloroisocyanurate salt such as potassium dichloroisocyanurate. When a tablet of dichloroisocyanurate salt different from sodium dichloroisocyanurate is input, the tablet may be input to washing tub 4 at the same timing as the softener.

[0219] An example including automatic input unit 7 has been described, but the present invention is not limited to this, and laundry agent supply unit 5 may include only manual input unit 6.

[0220] An example in which detergent case 60 accommodates detergent has been described, but the present invention is not limited to this. For example, detergent case 60 may accommodate bleach.

[0221] An example in which tablet J has a disk shape and is input to tablet case 63 in the vertically placed posture has been described, but the present invention is not limited to this. For example, tablet J may have another shape, and input port 63a is designed to match the shape of tablet J. The shape of input port 63a may be changed so that tablet J can be input to tablet case 63 in the horizontally placed posture.

[0222] In the exemplary embodiment, the example in which mesh 82 is constituted by ribs 82a and 82b extending in two intersecting directions has been described, but the invention is not limited to this. Mesh 82 may form a drain or a water passing region having a plurality of water passing holes.

[0223] An example in which tablet case 63 has a one-side open structure has been described, but the present invention is not limited to this. For example, tablet case 63 may have a lid facing side wall 80, and the lid may be removable with respect to tablet case 63. On the other hand, according to the one-side open structure of the first exemplary embodiment, tablet case 63 can be more easily manufactured.

[0224] An example in which water supply nozzles 12 and 13 include straight portions has been described, but the present invention is not limited to this. For example, water supply nozzles 12 and 13 may extend obliquely from openings 14 and 15.

[0225] An example in which path F2 between softener case 61 and tablet case 63 is common has been described, but the present invention is not limited to this. The water supply path of softener case 61 and the water supply path of tablet case 63 may be provided independently.

[0226] Although the sterile filtration course has been described as an example of the course in which the water-soluble solid agent is dissolved and supplied to washing tub 4, the course is not limited to this. The course is not limited to the course for sterile filtration, and may be a course that imparts various functionalities such as fragrance to the laundry.

[0227] An example including two rinsing processes has been described, but the present invention is not limited to this. For example, three or more rinsing processes may be included. In this case, the main water supply step is executed in a rinsing process before the rinsing process immediately before the final rinsing process. With such a configuration, fragments of tablet J adhering to the laundry can be more reliably washed off by the final rinsing process.

[0228] (Second exemplary embodiment)

Washing machine 51 according to the second exemplary embodiment of the present disclosure will be described. In the second exemplary embodiment, points different from the first exemplary embodiment will be mainly described, and the description overlapping the first exemplary embodiment will be omitted. In the second exemplary embodiment, a configuration identical or equivalent to a configuration of the first exemplary embodiment will be denoted by the same reference mark.

[0229] Fig. 16 is a schematic view of washing machine 51 of the second exemplary embodiment according to the present disclosure.

[0230] The second exemplary embodiment is different from the first exemplary embodiment in structure of the laundry agent supply unit. Washing machine 51 according to the second exemplary embodiment is a washing machine with a drying function.

[0231] As illustrated in Fig. 16, washing machine 51 includes drying device 58 that circulates drying air in washing tub 4. In order to form an air circulation path between drying device 58 and washing tub 4, washing machine 51 has lid 52 covering opened upper portions of washing tub 4 and water tub 3. Lid 52 seals opened upper portions of washing tub 4 and water tub 3.

[0232] Washing machine 51 includes laundry agent supply unit 55.

[0233] Laundry agent supply unit 55 includes manual input unit 56 and automatic input unit 7.

[0234] Subsequently, the configuration of laundry agent supply unit 55 will be described with reference to Figs. 17 and 18. Figs. 17 and 18 are perspective views of laundry agent supply unit 55.

[0235] As illustrated in Fig. 17, laundry agent supply unit 55 includes unit case 100, lid 100a, manual input unit 56, automatic input unit 7, water supply member 10, and channel member 101 (Fig. 18).

[0236] As illustrated in Fig. 18, unit case 100 is a member accommodating manual input unit 56, automatic input unit 7, and channel member 101. An upper portion of unit case 100 is opened, and covered with lid 100a.

[0237] In the following description, description of manual input unit 56 overlapping manual input unit 6 will be omitted, and description of channel member 101 overlapping channel member 11 will be omitted.

[0238] The configuration of manual input unit 6 will be described in more detail with reference to Figs. 18 to 21. Fig. 19 is a perspective view of manual input unit 56. Fig. 20 is a perspective view illustrating a state in which tablet case 113 and input port members 115 and 116 are removed from manual input unit 56. Fig. 21 is a perspective sectional view of manual input unit 56.

[0239] As illustrated in Fig. 18, manual input unit 56 includes body 114. Body 114 is a member held drawably in front-rear direction L in unit case 100.

[0240] As illustrated in Fig. 19, body 114 accommodates channel members 115 and 116 and case 113 (hereinafter, tablet case 113). Channel members 115 and 116 and tablet case 113 are removably accommodated in body 114.

[0241] As illustrated in Fig. 20, body 114 forms cases 110, 111, and 112, softener case 110 accommodates a softener, detergent case 111 accommodates a detergent, and powdery detergent case 112 accommodates a powdery detergent.

[0242] In body 114, softener case 110 and detergent case 111 are provided side by side in width direction K. Powdery detergent case 112 includes space 117 formed on front side L1 of cases 110 and 111, and channel 118 extending between case 110 and case 111. Channel 118 communicates with space 117. Channel 118 is inclined downward from a connection position with space 117 toward rear side L2, and has an outlet port (not illustrated) communicating with washing tub 4 at a lower end. Upper portions of cases 110 and 111 form input ports 110a and 111a, and an upper portion of space 117 forms input port 117a. Cases 110 and 111 are provided with liquid agent discharge channels 73 and 74, respectively.

[0243] Tablet case 113 is disposed on the upper portion of channel 118, that is, disposed between cases 110 and 111. Tablet case 113 accommodates tablet J and forms input port

113a for inputting tablet J on front side L1. Input port 113a is disposed between case 110 and case 111 aligned in width direction K.

[0244] Tablet case 113 includes grip 113b protruding upward from both sides of input port 113a. When removing tablet case 113 from body 114, the user can lift tablet case 113 by holding grip 113b. Grip 113b may be provided with a pattern so that the user can easily recognize that grip 113b is a member that can be held. In the second exemplary embodiment, protrusion 113c extending linearly is formed on a side surface of grip 113b.

[0245] Channel members 115 and 116 are disposed so as to cover liquid agent discharge channels 73 and 74 of cases 110 and 111, respectively.

[0246] Channel members 115 and 116 form restrictors 119 and 120, respectively, restricting entry of tablet J. As illustrated in Fig. 21, channel member 116 includes restrictor 120 protruding in front-rear direction L between input port 111a and inner bottom surface 111b of case 111. Restrictor 120 extends to intersect the drop direction of tablet J so as to suppress tablet J input to case 111 from reaching inner bottom surface 111b of case 111. Restrictor 120 is provided on an upstream of an inlet of liquid agent discharge channel 74. Similarly, channel member 115 includes restrictor 119 protruding in front-rear direction L.

[0247] Tablet case 113 includes restrictor 121 protruding downward at a connection position between space 117 and channel 118. Restrictor 121 extends to intersect the direction from space 117 toward channel 118 so as to suppress tablet J erroneously input to space 117 from entering channel 118. In other words, restrictor 121 has a function of narrowing the inlet port of channel 118. In the second exemplary embodiment, the distance from the lower end of restrictor 121 to bottom surface 118b of channel 118 is smaller than diameter D0 of tablet J.

[0248] Tablet case 113 has catcher 122 protruding in width direction K and caught on the upper portions of the side walls of cases 110 and 111. Catcher 122 includes restrictor 123 protruding further in width direction K with respect to catcher 122 and partially covering input ports 110a and 111a of cases 110 and 111. Restrictor 123 forms edge 124 facing in front-rear direction L so as to suppress tablet J input to case 110 from moving to rear side L2.

[0249] Fig. 22 is a perspective view of tablet case 113. Fig. 23 is a perspective view of tablet case 113 in the released state. Fig. 24 is a sectional view of tablet case 113 as viewed in front-rear direction L.

[0250] As illustrated in Fig. 22, input port 113a is formed in the upper portion of tablet case 113. Input port 113a is formed to extend in front-rear direction L from the front surface of tablet case 113. Input port 113a may have a vertically long shape similarly to input port 63a.

[0251] As illustrated in Fig. 23, tablet case 113 is an openable member, and includes first side wall 140, second side wall 142, peripheral wall 141, narrow portion 137, and holder 138. First side wall 140 and second side wall 142 are connected to each other by axis X of rotation. The posture of tablet case 113 can be changed between a posture in which first side wall 140 and second side wall 142 face each other (Fig. 22) and a posture in which first side wall 140 and second side wall 142 are along each other (Fig. 23) in a state of being removed from body 114. Specifically, second side wall 142 is rotatable (see arrow G) about axis X of rotation along peripheral wall 141. By rotating second side wall 142 to release the facing state, the inner wall of tablet case 113 can be easily accessed, and the inner wall of tablet case 113 can be easily washed and maintained.

[0252] First side wall 140 and second side wall 142 form mesh 132a penetrating in the thickness direction of the side wall. Tablet J having been dissolved flows out from mesh 132a together with water and is input to washing tub 4. First side wall 140 further forms mesh 132b on front side L1 of mesh 132a. Mesh 132b is formed at a height lower than the top of mesh 132a of first side wall 140.

[0253] Peripheral wall 141 is connected to the outer peripheral portion of first side wall 140 and forms bottom wall 136 of tablet case 113 extending in front-rear direction L. Bottom wall 136 below input port 113a forms water supply position K2 supporting tablet J having been input.

[0254] Narrow portion 137 is a wall protruding in width direction K from the inner walls of side walls 140 and 142 toward the facing side walls. Narrow portion 137 has a function of sectioning first space R11 where water supply position K2 is positioned and second space R12 on rear side L2. First space R11 is a space for accommodating tablet J and corresponds to accommodation space K10 in the first exemplary embodiment. Second space R12 is a space for allowing sufficiently small fragments generated from tablet J having been dissolved to pass therethrough and ejecting the fragments from mesh 132a. Narrow portion 137 suppresses tablet J and large fragments generated from tablet J from flowing into second space R12 from first space R11. The large fragments mean fragments that cannot pass through mesh 132a and have a size that blocks mesh 132a.

[0255] As illustrated in Fig. 24, interval R5 between narrow portion 137 provided in first side wall 140 and narrow portion 137 provided in second side wall 142 decreases toward bottom wall 136. Therefore, passage of large and heavy fragments of tablet J is easily restricted by the structure of narrow portion 137.

[0256] Holder 138 protrudes further in width direction K from narrow portion 137. Holder 138 connects narrow portion 137 provided in first side wall 140 and narrow portion 137 provided in second side wall 142. Therefore, even when tablet J becomes thin, tablet J can be restricted from moving from first space R11 to second space R12.

[0257] Fig. 25 is a sectional view of laundry agent supply unit 55. As illustrated in Fig. 25, water supply nozzles 12 and 13 are provided above water supply position K2. Water is supplied to tablet case 113 through input port 113a. Therefore, input port 113a is used for both input of tablet J and water supply. Similarly to first exemplary embodiment, the water discharged from water supply nozzles 12 and 13 is applied to side walls 140 and 142 around water supply position K2.

[0258] [Effects]

Washing machine 51 according to the second exemplary embodiment can achieve the following effects.

[0259] As described above, washing machine 51 of the present exemplary embodiment includes washing tub 4 rotatably provided in housing 2, and laundry agent supply unit 55 supplying laundry agent to washing tub 4. Laundry agent supply unit 55 includes detergent case 111 (first laundry agent case) and tablet case 113 (solid agent case). Detergent case 111 is provided with input port 111a (first laundry agent input port) through which detergent (first laundry agent) is input, and accommodates and supplies, to washing tub 4, the detergent. Tablet case 113 is provided with input port 113a (solid agent input port) through which tablet J (solid agent) that is water-soluble is input, and accommodates and supplies, to washing tub 4, tablet J. Detergent case 111 is provided with an accommodation space (laundry agent accommodation space) for accommodating detergent and restrictor 120 for restricting passage of tablet J.

[0260] Such a configuration can suppress erroneous input of tablet J into input port 111a. Even when tablet J is erroneously input to detergent case 111, passage of tablet J is restricted, and therefore tablet J can be easily taken out from detergent case 111 and input again in a correct place. By inputting again, tablet J reaches water supply position K2 and can receive water supply at an appropriate timing.

[0261] In washing machine 51 of the present exemplary embodiment, restrictor 120 protrudes in front-rear direction L (lateral direction) between input port 111a and inner bottom surface 111b of case 111.

[0262] With such a configuration, tablet J erroneously input to case 111 hits restrictor 120 and is less likely to reach inner bottom surface 111b of detergent case 111. Input port 113a is not positioned in the vicinity of the end of manual input unit 56 but is between input port 111a and input port 110a. Therefore, even if tablet J is erroneously dropped from the hand, it is possible to suppress tablet J from directly dropping into washing tub 4. Since the left and right of input port 113a are provided with restrictors 119 and 120, even if tablet J is erroneously dropped from the hand to the left and right of input port 113a, tablet J is caught by any of left and right restrictors 119 and 120. Therefore, erroneous input of tablet J can be suppressed. Even in the case of erroneous input, since tablet J stops at a position closer to input ports 110a and 111a than the bottom surfaces of cases 110 and 111, tablet J is easily taken out.

[0263] In washing machine 51 of the present exemplary embodiment, laundry agent supply unit 55 includes liquid agent discharge channel 74 (ejection portion) that ejects detergent and water from the accommodation space. Restrictor 120 is provided at the inlet of liquid agent discharge channel 74.

[0264] Such a configuration can suppress tablet J from reaching liquid agent discharge channel 74 even if tablet J is erroneously dropped into input port 111a.

[0265] In washing machine 51 of the present exemplary embodiment, tablet case 113 includes first side wall 140, second side wall 142 facing first side wall 140, and axis X of rotation (connection) openably connecting first side wall 140 and second side wall 142.

[0266] Such a configuration can release the facing state of side walls 140 and 142 by rotating tablet case 113 around axis X of rotation. Therefore, the inner wall of tablet case 113 can be easily accessed, tablet case 113 can be easily washed and maintained, and fragments of tablet J adhering to the inner wall can be washed off.

[0267] In washing machine 51 of the present exemplary embodiment, first side wall 140 and second side wall 142 have mesh 132a (drain) formed to allow water to pass therethrough.

[0268] With such a configuration, by providing side walls 140 and 142 on both sides with mesh 132a, it is possible to further improve the drainage property of tablet case 113. Therefore, even when the volume of tablet case 113 is small, it is possible to suppress a

rise in the water level in tablet case 113 and to suppress fragments of tablet J from adhering to the upper portion of tablet case 113 and remaining undissolved.

[0269] In washing machine 51 of the present exemplary embodiment, first side wall 140 includes catcher 122 (first catcher) protruding outward from water supply position K2 (tablet accommodation space), and second side wall 142 includes catcher 122 (second catcher) protruding outward from water supply position K2.

[0270] With such a configuration, by providing side walls 140 and 142 on both sides with catcher 122, it is possible to stably hold tablet case 113 in manual input unit 56.

[0271] A washing machine of a first aspect includes: a washing tub rotatably provided in a housing; and a laundry agent supply unit that supplies laundry agent to the washing tub, in which the laundry agent supply unit includes a first laundry agent case provided with a first laundry agent input port through which a first laundry agent is input, the first laundry agent case accommodating and supplying, to the washing tub, the first laundry agent, a second laundry agent case provided with a second laundry agent input port through which a second laundry agent different from the first laundry agent is input, the second laundry agent case accommodating and supplying, to the washing tub, the second laundry agent, and a solid agent case provided with a solid agent input port into which a solid agent is input, the solid agent case accommodating and supplying, to the washing tub, the solid agent, and the solid agent input port is disposed between the first laundry agent input port and the second laundry agent input port.

[0272] As a washing machine according to a second aspect, in the washing machine according to the first aspect, a rinsing process is executed in a state where the solid agent case accommodates the solid agent or in a state where the second laundry agent case accommodates the second laundry agent after a washing process, the second laundry agent case is configured to supply, to the washing tub in the rinsing process, the second laundry agent that is accommodated, and the solid agent case is provided adjacent to the second laundry agent case.

[0273] As a washing machine according to a third aspect, in the washing machine according to the first or second aspect, the solid agent case includes an accommodation space defined by a wall surface of at least the solid agent case, and a width in a short direction of the accommodation space is substantially same in size as a width in a short direction of the solid agent input port.

[0274] As a washing machine according to a fourth aspect, in the washing machine

according to any of the first to third aspects, the first laundry agent case, the solid agent case, and the second laundry agent case are disposed adjacent to one another in one direction, and the solid agent case is provided such that the one direction is a short direction of the fixing agent case.

[0275] As a washing machine according to a fifth aspect, in the washing machine according to any of the first to fourth aspects, the solid agent input port has a vertically long shape that is long in a direction orthogonal to the one direction.

[0276] As a washing machine according to a sixth aspect, in the washing machine according to any of the first to fifth aspects, the laundry agent supply unit is configured to be drawable from a washing machine body, the solid agent case includes an accommodation space accommodating the solid agent and an opening provided in an upper portion of the solid agent case, and the opening exposes the accommodation space in a state where the laundry agent supply unit is drawn out from the washing machine body.

[0277] As a washing machine according to a seventh aspect, in the washing machine according to any of the first to sixth aspects, the solid agent case includes a guide that guides the solid agent from the solid agent input port to the accommodation space, and the opening is provided above the accommodation space.

[0278] A washing machine of an eighth aspect includes: a washing tub rotatably provided in a housing; and a laundry agent supply unit that supplies laundry agent to the washing tub, in which the laundry agent supply unit includes a first laundry agent case provided with a first laundry agent input port through which a first laundry agent is input, the first laundry agent case accommodating and supplying, to the washing tub, the first laundry agent, and a solid agent case provided with a solid agent input port through which a solid agent that is water-soluble is input, the solid agent case accommodating and supplying, to the washing tub, the solid agent, and the first laundry agent case is provided with a laundry agent accommodation space accommodating the first laundry agent and a restrictor restricting passage of the solid agent.

[0279] As a washing machine according to a ninth aspect, in the washing machine according to the eighth aspect, a width dimension of a maximum width of the first laundry agent input port is smaller than a dimension in a long direction of the solid agent input port.

[0280] As a washing machine according to a tenth aspect, in the washing machine according to the eighth or ninth aspect, a wall defining the first laundry agent input port

functions as the restrictor.

[0281] As a washing machine according to an 11th aspect, in the washing machine according to any of the eighth to tenth aspects, the restrictor protrudes in a lateral direction between the first laundry agent input port and an inner bottom surface of the laundry agent accommodation space.

[0282] As a washing machine according to a 12th aspect, in the washing machine according to any of the eighth to 11th aspects, the laundry agent supply unit includes an ejection portion that ejects the first laundry agent and water from the laundry agent accommodation space, and the restrictor is provided at an inlet of the ejection portion.

[0283] A washing machine according to a 13th aspect, in the washing machine according to any of the eighth to 12th aspects, further includes a second laundry agent case provided with a second laundry agent input port through which a second laundry agent is input, the second laundry agent case accommodating and supplying, to the washing tub, the second laundry agent, in which the solid agent input port is disposed between the first laundry agent case and the second laundry agent case.

[0284] As a washing machine according to a 14th aspect, in the washing machine according to any of the eighth to 13th aspects, the solid agent input port is disposed between the restrictor provided in the first laundry agent case and the restrictor provided in the second laundry agent case.

[0285] As a washing machine according to a 15th aspect, in the washing machine according to any of the eighth to 14th aspects, the solid agent case includes an accommodation space accommodating the solid agent in a state of holding, and a width in a short direction of the accommodation space is substantially same in size as a width in a short direction of the solid agent input port.

[0286] A washing machine of a 16th aspect includes: a washing tub rotatably provided in a housing; and a solid agent case including a solid agent accommodation space accommodating a solid agent that is water-soluble, and supplying, to the washing tub, the solid agent dissolved in water, in which the solid agent case is removably provided in the housing, the solid agent accommodation space is defined by a facing wall surface in a state where the solid agent case is attached to the housing, and a facing state of the wall surface is releaseable in a state where the solid agent case is removed from the housing.

[0287] As a washing machine according to a 17th aspect, in the washing machine according to the 16th aspect, at least one of the wall surfaces has a drain formed to allow

water to pass through.

[0288] As a washing machine according to an 18th aspect, in the washing machine according to the 16th or 17th aspect, the wall surfaces face each other in a short direction of the solid agent accommodation space.

[0289] As a washing machine according to a 19th aspect, in the washing machine according to any of the 16th to 18th aspects, the solid agent case forms a solid agent input port into which the solid agent is input, and a width in a short direction of the solid agent input port and a width in a short direction of the solid agent accommodation space are substantially the same.

[0290] As a washing machine according to a 20th aspect, in the washing machine according to any of the 16th to 19th aspects, the solid agent case is disposed such that a short direction of the solid agent accommodation space is substantially horizontal.

[0291] As a washing machine according to a 21st aspect, in the washing machine according to any of the 16th to 20th aspects, the solid agent case includes a catcher protruding outward from the solid agent accommodation space.

[0292] A washing machine according to a 22nd aspect, in the washing machine according to any of the 16th to 21st aspects, further includes: a laundry agent case disposed adjacent to the solid agent case and accommodating laundry agent supplied to the washing tub, in which the wall surface is a pair of side walls, one of the side walls is configured with the solid agent case and includes a drain formed to allow water to pass through, and an other of the side walls is configured with the laundry agent case.

[0293] As a washing machine according to a 23rd aspect, in the washing machine according to any of the 16th to 22nd aspects, the solid agent case includes a peripheral wall facing the laundry agent case, and the peripheral wall includes a projection protruding toward the laundry agent case.

[0294] As a washing machine according to a 24th aspect, in the washing machine according to any of the 16th to 23rd aspects, water supply paths of the laundry agent case and the solid agent case are common.

[0295] As a washing machine according to a 25th aspect, in the washing machine according to any of the 16th to 21st aspects, the solid agent case includes, as the wall surface, a first side wall and a second side wall facing the first side wall, and the solid agent case further includes a connection portion openably connecting the first side wall and the second side wall.

[0296] As a washing machine according to a 26th aspect, in the washing machine according to any of the 16th to 21st or 25th aspects, the first side wall and the second side wall include a drain formed to allow water to pass through.

[0297] As a washing machine according to a 27th aspect, in the washing machine according to any of the 16th to 21st or 25th or 26th aspect, the first side wall includes a first catcher protruding outward from the solid agent accommodation space, and the second side wall includes a second catcher protruding outward from the solid agent accommodation space. Although the present disclosure has been fully described with reference to preferred exemplary embodiments and with reference to the accompanying drawings, various variations and modifications will become apparent to those skilled in the art. It should be understood that, as long as such variations and modifications do not deviate from the scope of the present invention according to claims appended, such variations and modifications are included therein.

INDUSTRIAL APPLICABILITY

[0298] The washing machine of the present disclosure is useful as a household washing machine, a commercial washing machine, or any type of a washer dryer (e.g., a household drum-type washing machine) since the function of the configuration related to input of the solid agent can be improved.

REFERENCE MARKS IN THE DRAWINGS

- [0299] 1: washing machine
2: housing
3: water tub
4: washing tub
5: laundry agent supply unit
6: manual input unit
7: automatic input unit
10: water supply member
11: channel member
12: water supply nozzle
13: water supply nozzle
26: internal channel

27: internal channel
26b: end channel
27b: end channel
50: unit case
60: detergent case
61: softener case
62: powdery detergent case
63: tablet case
63a: input port
65: input port member
66: input port member
68: guide
80: side wall
81: peripheral wall
82: mesh
84: inclined surface
87: protrusion
88: protrusion

CLAIMS

1. A washing machine comprising:

a washing tub rotatably provided in a housing; and

a laundry agent supply unit that supplies laundry agent to the washing tub,
wherein the laundry agent supply unit includes

a first laundry agent case including a first laundry agent input port
through which a first laundry agent is input, the first laundry agent case accommodating
and supplying, to the washing tub, the first laundry agent,

a second laundry agent case provided with a second laundry agent input
port through which a second laundry agent different from the first laundry agent is input,
the second laundry agent case accommodating and supplying, to the washing tub, the
second laundry agent, and

a solid agent case provided with a solid agent input port into which a
solid agent is input, the solid agent case accommodating and supplying, to the washing tub,
the solid agent, and

the solid agent input port is disposed between the first laundry agent input port
and the second laundry agent input port.

2. The washing machine according to Claim 1, wherein

a rinsing process is executed in a state where the solid agent case accommodates
the solid agent or in a state where the second laundry agent case accommodates the second
laundry agent after a washing process,

the second laundry agent case is configured to supply, to the washing tub in the
rinsing process, the second laundry agent that is accommodated, and

the solid agent case is provided adjacent to the second laundry agent case.

3. The washing machine according to Claim 1 or 2, wherein

the solid agent case includes an accommodation space defined by a wall surface of
at least the solid agent case, and

a width in a short direction of the accommodation space is substantially same in
size as a width in a short direction of the solid agent input port.

4. The washing machine according to Claim 1, wherein
the first laundry agent case, the solid agent case, and the second laundry agent case are disposed adjacent to one another in one direction, and
the solid agent case is provided to cause the one direction to be a short direction of the fixing agent case.

5. The washing machine according to Claim 4, wherein the solid agent input port has a vertically long shape that is long in a direction orthogonal to the one direction.

6. The washing machine according to Claim 1, wherein
the laundry agent supply unit is configured to be drawable from a washing machine body,
the solid agent case includes an accommodation space accommodating the solid agent and an opening provided in an upper portion of the solid agent case, and
the opening exposes the accommodation space in a state where the laundry agent supply unit is drawn out from the washing machine body.

7. The washing machine according to Claim 6, wherein
the solid agent case includes a guide that guides the solid agent from the solid agent input port to the accommodation space, and
the opening is provided above the accommodation space.

8. A washing machine comprising:
a washing tub rotatably provided in a housing; and
a laundry agent supply unit that supplies laundry agent to the washing tub,
wherein the laundry agent supply unit includes
a first laundry agent case provided with a first laundry agent input port through which a first laundry agent is input, the first laundry agent case accommodating and supplying, to the washing tub, the first laundry agent, and
a solid agent case provided with a solid agent input port through which a solid agent that is water-soluble is input, the solid agent case accommodating and supplying, to the washing tub, the solid agent, and
the first laundry agent case is provided with a laundry agent accommodation space

accommodating the first laundry agent and a restrictor restricting passage of the solid agent.

9. The washing machine according to Claim 8, wherein a width dimension of a maximum width of the first laundry agent input port is smaller than a dimension in a long direction of the solid agent input port.

10. The washing machine according to Claim 8, wherein a wall defining the first laundry agent input port functions as the restrictor.

11. The washing machine according to claim 8, wherein the restrictor protrudes in a lateral direction between the first laundry agent input port and an inner bottom surface of the laundry agent accommodation space.

12. The washing machine according to Claim 8, wherein the laundry agent supply unit includes an ejection portion that ejects the first laundry agent and water from the laundry agent accommodation space, and the restrictor is provided at an inlet of the ejection portion.

13. The washing machine according to Claim 8, further comprising a second laundry agent case provided with a second laundry agent input port through which a second laundry agent is input, the second laundry agent case accommodating and supplying, to the washing tub, the second laundry agent, wherein the solid agent input port is disposed between the first laundry agent case and the second laundry agent case.

14. The washing machine according to Claim 13, wherein the solid agent input port is disposed between the restrictor provided in the first laundry agent case and the restrictor provided in the second laundry agent case.

15. The washing machine according to any one of Claims 8 to 14, wherein the solid agent case includes an accommodation space accommodating the solid agent in a state of holding, and a width in a short direction of the accommodation space is substantially same in

size as a width in a short direction of the solid agent input port.

16. A washing machine comprising:
a washing tub rotatably provided in a housing; and
a solid agent case including a solid agent accommodation space accommodating a solid agent that is water-soluble, and supplying, to the washing tub, the solid agent dissolved in water,
wherein the solid agent case is removably provided in the housing,
the solid agent accommodation space is defined by a facing wall surface in a state where the solid agent case is attached to the housing, and
a facing state of the wall surface is releaseable in a state where the solid agent case is removed from the housing.

17. The washing machine according to Claim 16, wherein at least one of the wall surfaces includes a drain formed to allow water to pass through.

18. The washing machine according to Claim 16, wherein the wall surfaces face each other in a short direction of the solid agent accommodation space.

19. The washing machine according to Claim 16, wherein
the solid agent case forms a solid agent input port into which the solid agent is input, and
a width in a short direction of the solid agent input port and a width in a short direction of the solid agent accommodation space are substantially same.

20. The washing machine according to Claim 19, wherein the solid agent case is disposed to cause short direction of the solid agent accommodation space to be substantially horizontal.

21. The washing machine according to Claim 16, wherein the solid agent case includes a catcher protruding outward from the solid agent accommodation space.

22. The washing machine according to any one of Claims 16 to 21, further

comprising a laundry agent case disposed adjacent to the solid agent case and accommodating laundry agent supplied to the washing tub,

wherein the wall surface is a pair of side walls,

one of the side walls is configured with the solid agent case and includes a drain formed to allow water to pass through, and

another of the side walls is configured with the laundry agent case.

23. The washing machine according to Claim 22, wherein

the solid agent case includes a peripheral wall facing the laundry agent case, and

the peripheral wall includes a projection protruding toward the laundry agent case.

24. The washing machine according to Claim 23, wherein water supply paths of the laundry agent case and the solid agent case are common.

25. The washing machine according to Claim 16, wherein

the solid agent case includes, as the wall surface, a first side wall and a second side wall facing the first side wall, and

the solid agent case further includes a connection portion openably connecting the first side wall and the second side wall.

26. The washing machine according to Claim 25, wherein the first side wall and the second side wall include a drain formed to allow water to pass through.

27. The washing machine according to Claim 25, wherein

the first side wall includes a first catcher protruding outward from the solid agent accommodation space, and

the second side wall includes a second catcher protruding outward from the solid agent accommodation space.