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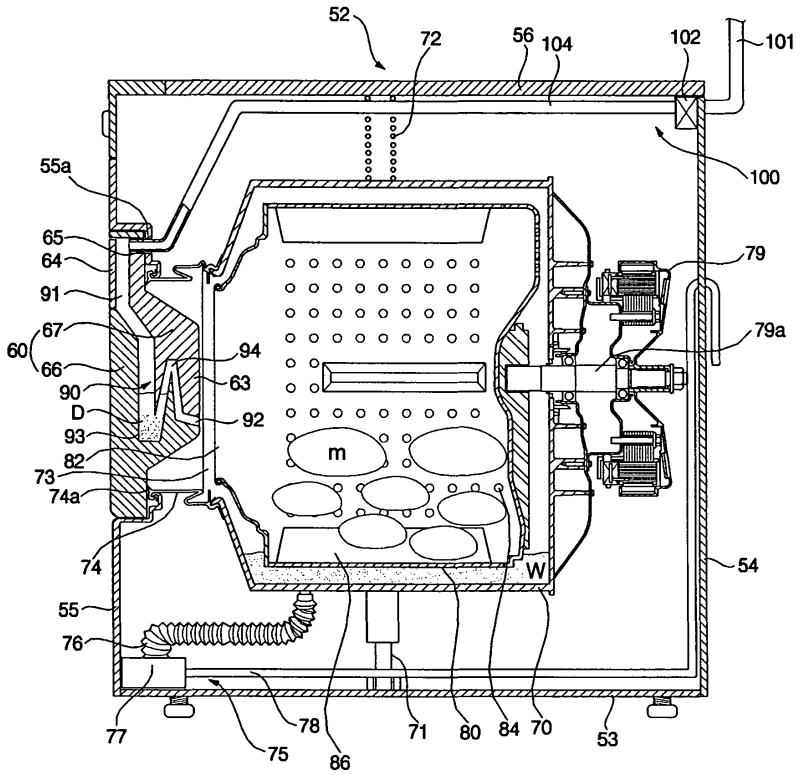
(54) Washing machine

(57) A washing machine has a detergent supply part formed in a door. The detergent supply part 90 is formed in the door and has a function of containing detergent and supplying detergent D into a tub through the door 60. The washing machine has the advantage of considerable space saving compared with the washing machine having the detergent supply part formed separately, thereby minimizing the size and the number of components of the washing machine.

FIG. 3



EP 1 634 987 A1

Description

[0001] The present invention relates to a washing machine, and more particularly but not exclusively, to a washing machine which has a detergent injection part equipped in a door, thereby allowing space saving in the washing machine.

[0002] Generally, a washing machine is used to remove contaminants adhered to laundry contained in a drum through interaction between water and detergent by a process of washing, rinsing and dewatering the laundry. The washing machine comprises a detergent supplying device which supplies the detergent combined with wash water into a tub.

[0003] Fig. 1 is a side sectional view illustrating the inner structure of a conventional washing machine, and Fig. 2 is a perspective view illustrating the conventional washing machine of Fig. 1, from which a detergent drawer has been withdrawn.

[0004] Referring to Figs. 1 and 2, the conventional washing machine comprises a cabinet 2 having a laundry entrance 1 formed in one face, a tub 10 suspended within the cabinet 2 for containing detergent-dissolved water (which will hereinafter be referred to as "wash water") or detergent-free water (which will hereinafter be referred to as "rinsing water"), a drum 12 rotatably disposed within the tub 10 for containing laundry m, a motor 14 including a shaft 13 for supporting and rotating the drum 12, a water supply device 16 for supplying water, a detergent supplying device 20 for containing detergent and supplying it into the tub 10 in which the detergent is dissolved in the water supplied by the water supply device 16 which passes through it, and a drainage device 30 for draining contaminated water from the tub 10 to the outside.

[0005] A door 4 for opening/closing the laundry entrance 1 is hinged to the cabinet 2.

[0006] A control panel 7 for controlling the washing machine is installed on an upper portion of a front face of the cabinet 2.

[0007] The control panel 7 is formed either to left or right of a detergent drawer mounting hole 8, through which a detergent drawer as described below is loaded or unloaded to the washing machine.

[0008] The drum 12 is formed with through-holes 13 such that the wash water or the rinsing water supplied to the tub 10 is introduced into the drum 12 so as to allow the laundry m to be immersed.

[0009] The detergent supplying device 20 comprises a detergent drawer housing 21 installed at the rear of the detergent barrel mounting hole 8, a detergent barrel 22 inserted through the mounting hole 8 to be received in the detergent drawer housing 21 and having a detergent containing portion 22a defined therein, and a dispenser 23 mounted to the rear of the control panel 7 and located above the detergent drawer housing 21 for dispensing water supplied through the water supply device 16 to the detergent drawer 22.

[0010] The housing 21 is connected to a water supply pipe 24 for guiding the wash water or the rinsing water passing through the detergent drawer 22 into the tub 10.

[0011] Reference numeral 11 indicates a pipe connecting port formed on the tub 10 for connecting the water supply bellows 24 to the tub 10.

[0012] In order to wash laundry using the conventional washing machine constructed as described above, the detergent drawer 8 is pulled out from the washing machine, and detergent or fabric softener is placed into the detergent containing portion 22a. Then, the detergent drawer 22 is pushed back into the housing 21.

[0013] Then, after putting laundry m into the drum, and closing the door 4, an operating command is input through the control panel 7 so that the motor 14, the water supply device 16, and the drainage device 30 of the washing machine are operated according to the operating command.

[0014] When instructions for a washing process are input through the control panel 7, the washing machine operates the water supply device 16 to allow water supplied from the outside to be guided to the dispenser 23, which guides the water into the detergent drawer 22. Then, the detergent in the detergent drawer 22 is dissolved in the water, is discharged towards the housing 21, and is supplied into the tub 10 through the water supply pipe 24.

[0015] Detergent-dissolved water (that is, wash water) supplied into the tub 10 is introduced into the drum 12 via the through-holes 13 of the drum 12, and soaks the laundry m.

[0016] After the water is supplied into the washing machine, the motor 14 rotates the drum 12, and the laundry is cleaned through interaction of the laundry and the wash water.

[0017] After performing the washing process as described above for a predetermined period, the washing machine allows the drainage device 30 to discharge contaminated water from the tub 10 to the outside.

[0018] After finishing the washing process comprising the steps of supplying water, washing the laundry and draining the water, instructions for a rinsing process are input through the control panel 7, and then the washing machine operates the water supply device 16 to guide water supplied from the outside into the dispenser 23. The dispenser 23 guides the water into the detergent drawer 22. Then, the water is supplied into the tub 10 through the housing 21 and the water supply pipe 24.

[0019] As with the washing process, detergent free water (that is, rinsing water) supplied into the tub 10 soaks into the laundry. Then, the motor 14 rotates the drum 12, and the laundry is rinsed through interaction between the laundry and the rinsing water, so that the detergent or suds is removed from the laundry.

[0020] After performing the rinsing process as described above for a predetermined period, the washing machine allows the drainage device 30 to discharge contaminated water from the tub 10 to the outside.

[0021] However, the conventional washing machine

has problems in that the detergent supplying device 20 occupies a large space inside the washing machine, thereby increasing the volume of the washing machine, and in that the detergent supplying device 20 comprises a number of components such as the detergent drawer housing 21, the water supply pipe 24 and the like, thereby complicating the assembling process.

[0022] Additionally, since the pipe connecting port 11 must molded to the tub 10, molding of the tub becomes more complicated, thereby increasing manufacturing costs.

[0023] The present invention is defined in the accompanying independent calims. Some preferred features are recited in the dependent claims.

[0024] Embodiments described herein address the above problems, and reduce the volume of the washing machine, minimize the number of components and assembling steps, simplify a molding process of a tub, and/or reduce manufacturing costs.

[0025] In accordance with an embodiment the above and other objects can be accomplished by the provision of a washing machine, comprising: a cabinet having a laundry entrance formed therein; a door for opening/closing the laundry entrance; a tub installed within the cabinet; a drum rotatably disposed within the tub for containing laundry; and a detergent supply part formed in the door.

[0026] The detergent supply part may have an inlet formed on a front side of the door, and an outlet formed on a rear side of the door.

[0027] The door may be provided with a shutter for opening/closing the inlet

[0028] The shutter may be hinged at a lower end to the door such that an upper portion of the shutter is opened in front of the door about the lower end.

[0029] The door may comprise a front panel having the inlet of the detergent supply part formed at one side of the front panel, and a rear panel coupled to a rear side of the front panel and having the outlet of the detergent supply part formed therein.

[0030] The rear side of the door may have a central portion protruded towards an inner portion of the drum, and the outlet may be formed at the central portion of the rear side of the door.

[0031] The inlet and the outlet of the detergent supply part may be formed at the rear side of the door.

[0032] The door may comprise a front panel, and a rear panel coupled to a rear side of the front panel, the rear panel having an inlet of the detergent supply part formed at an upper portion of the rear panel, and an outlet of the detergent supply part formed at a lower portion thereof.

[0033] The door may comprise a door frame having the detergent supply part and a hole formed therein, and a door glass mounted to the hole and convexly formed towards the drum.

[0034] The door frame may comprise a front panel having an inlet of the detergent supply part formed at an upper portion of the front panel, and a rear panel coupled to a rear side of the front panel and having an outlet of the detergent supply part formed at a lower portion of the rear panel.

[0035] The washing machine may further comprise a water supply device disposed therein so as to communicate with the detergent supply part when the door is closed.

[0036] The cabinet may be formed with a through-hole through which a portion of the water supply device passes.

[0037] The door may be formed with an insertion hole through which the portion of the water supply device is introduced into the detergent supply part when the door is closed.

[0038] The water supply device may comprise a water supply valve for controlling water supply through an external hose, and a water supply hose disposed to guide water passing through the water supply valve to the detergent supply part when the door is closed.

[0039] The detergent supply part may comprise a detergent containing portion having a predetermined space defined to allow the detergent input through the inlet to be contained therein, and a siphon port through which the detergent in the detergent containing portion is discharged along with the supplied water to the outlet.

[0040] According to the embodiments constructed as described above, since the washing machine has the detergent supply part formed in the door, which has a function of containing detergent and supplying the detergent into a tub through the door, it has an advantage of considerable space saving compared with the washing machine having the detergent supply part in an inner space thereof thereby minimizing the volume and the number of components of the washing machine.

[0041] Additionally, the inlet and outlet of the detergent supply part may be formed in the front and rear sides of the door, respectively, so that the detergent can be supplied/added to the washing machine when the door is closed, thereby enhancing user convenience.

[0042] Additionally, the inlet and outlet of the detergent supply part may be formed in the rear side of the door, so that the detergent supply part is concealed, thereby enhancing the frontal appearance of the washing machine.

[0043] Additionally, the shutter for opening/closing the inlet ofthe detergent supply part may be installed to the door, thereby preventing foreign matter from entering the detergent supply part, and preventing water supplied through the water supply device from being leaked to the outside.

[0044] Additionally, the door may comprise the door frame having the detergent supply part and the hole formed therein, and the door glass mounted to the hole, so that the detergent can be supplied through the door frame and the inside of the washing machine can be seen through the door glass.

[0045] The foregoing and other objects and features

of the present invention will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a side sectional view illustrating the inner structure of a conventional washing machine;
Fig. 2 is a perspective view illustrating the conventional washing machine of Fig. 1, from which a detergent barrel has been withdrawn;
Fig. 3 is a side sectional view illustrating the inner structure of a washing machine in accordance with a first embodiment;
Fig. 4 is a perspective view illustrating the washing machine in accordance with the first embodiment;
Fig. 5 is a side sectional view illustrating the inner structure of a washing machine in accordance with a second embodiment;
Fig. 6 is a perspective view illustrating the washing machine of Fig. 5, a door of which is opened,
Fig. 7 is a side sectional view illustrating the inner structure of a washing machine in accordance with a third embodiment; and
Fig. 8 is a perspective view illustrating the washing machine in accordance with the third embodiment

[0046] As shown in Figs. 3 and 4, the front loading washing machine according to the first embodiment comprises: a cabinet 52 having a laundry entrance 51 formed therein; a door 60 for opening/closing the laundry entrance 51; a tub 70 mounted within the cabinet 52; a drum 80 rotatably disposed within the tub 70 for containing laundry m; a detergent supply part 90 formed in the door 60; and a water supply device 100 disposed therein so as to communicate with the detergent supply part 90 when the door is closed in order to supply water to the detergent supply part 90.

[0047] The cabinet 52 comprises a base plate 53 constituting a bottom surface of the washing machine, a cabinet body 54 located on the base plate 53 to constitute lateral sides and a rear face of the washing machine, a cabinet cover 55 located at the front of the cabinet 54 to constitute a front face of the washing machine and having the laundry entrance 51 formed at the center of the cabinet cover 55, and a top cover 56 located on the cabinet body 54 to constitute a top surface of the washing machine.

[0048] The cabinet cover 55 of the cabinet 52 is formed with a through-hole 55a through which a portion of the water supply device 100 passes, such that the water supply device 100 communicates with the detergent supply part 90 when the door 60 is closed.

[0049] One side of the door 60 is hinged to the cabinet 52 about a vertical axis, in particular, to the cabinet cover 55.

[0050] The opposite side of the door 60 is equipped with a hook which is locked to/released from a door locking switch mounted on the cabinet 52, in particular, on the cabinet cover 55.

[0051] The door 60 has a rear central portion 63 which protrudes towards an inner portion ofthe drum 80.

[0052] The door 60 is equipped with a shutter 64 for opening/closing an inlet 91 to the detergent supply part 90.

[0053] The shutter 64 is hinged to the door 60 about a horizontal axis.

[0054] More specifically, the shutter 64 is hinged at a lower end to the door 60 such that an upper portion of the shutter is opened in front of the washing machine about the lower end of the shutter 64.

[0055] The door 60 is formed with an insertion hole 65 through which the portion of the water supply device 100 projects into the detergent supply part 90 when the door 60 is closed

[0056] The insertion hole 65 is preferably formed on the rear side of the door 60, and in particular, in front of the through-hole 55a of the cabinet cover 55, such that the portion of the water supply device 100 is easily introduced into the detergent supply part 90 therethrough when the door 60 is closed.

[0057] The door 60 comprises a front panel 66, and a rear panel 67 coupled to a rear side of the front panel 66. The front panel 66 has the inlet 91 for the detergent supply part 90 formed at one side thereof. The rear panel 67 has an outlet 92 for the detergent supply part 90 formed at one side of the rear panel 67. The insertion hole 65 is formed at the other side of the rear panel 67.

[0058] The tub 70 acts to contain detergent-dissolved water (which will hereinafter be referred to as ''wash water") or detergent-free water (which will hereinafter be referred to as '"rinsing water"). The tub 70 is connected to the cabinet 52, in particular, to a damper 71 coupled to the base plate 53, and to a spring 72 coupled to the cabinet body 54, so that it is resiliently supported inside the cabinet 52.

[0059] The tub 70 is formed with an opening 73 behind the laundry entrance 51, and is disposed horizontally or substantially horizontally above the bottom surface of the washing machine.

[0060] The tub 70 has a sealing gasket 74 which is brought into intimate contact with the rear side of the door 60 when the door 60 is closed, thereby to prevent leaking.

[0061] The gasket 74 is connected at one end to the opening 73 of tub 70 and is connected at the other end to the cabinet cover 55 so as to define a skirt which shields a space defined between the opening 73 of the tub 70 and the laundry entrance 51 ofthe cabinet cover 55.

[0062] The gasket 74 is formed around an inner peripheral surface with a sealing portion 74a which is brought into sealing contact with the rear side of the door 60 when the door 60 is closed.

[0063] The tub 70 is connected to a drainage device 75 for discharging the wash water, the rinsing water, and the water from the laundry, from the tub 70 to the outside of the washing machine.

[0064] The drainage device 75 comprises a flexible drainage pipe 76 connected to the tub 70 for allowing the

water to be drained from the tub 70, a drainage pump 77 for pumping the water drained through the drainage bellows 76, and a drainage hose 78 for guiding the water pumped by the drainage pump 77 to the outside of the washing machine.

[0065] The tub 70 is mounted with a motor 79 for supporting and rotating the drum 50.

[0066] The motor 79 comprises a stator fixed to a rear side of the tub 80, a rotor surrounding the periphery and the rear side of the stator, and a shaft 79a passing through the rear side of the tub 70 and coupled to the rotor and the rear side of the drum 80.

[0067] As with the tub, the drum 80 is also disposed horizontally or substantially horizontally relative to the bottom surface of the washing machine such that a lower portion of the drum 80 is located in the wash water or in the rinsing water within the tub 70. That is to say, the axis of the drum is also parallel or substantially parallel to the bottom surface.

[0068] The drum 80 has an entrance 82 formed at the rear of the laundry entrance 5 1 for allowing the laundry m, the wash water or the rinsing water to enter the drum 80, a plurality of through-holes formed around the peripheral surface, or on the rear side thereof, such that the wash water or the rinsing water supplied to the tub 10 can enter the drum 12, and a lifter or agitator 86 formed around an inner peripheral surface thereof for raising and dropping the laundry m.

[0069] The inlet 91 of the detergent supply part 90 may be formed in at least one of the front side, the rear side and the peripheral surface of the door 60. The following description is limited to the case where the inlet 91 of the detergent supply part 90 is formed at the front side of the door 60. However, similar comments apply to the other arrangements *mutatis mutandis*

[0070] The outlet 92 of the detergent supply part 90 is formed at the rear side of the door 60.

[0071] The outlet 92 is formed at the rear central portion 63 of the door 60 so as to prevent the wash water or the rinsing water from dropping to the gasket 74 while allowing the wash water or the rinsing water to drop into the tub 70 or the drum 80.

[0072] The detergent supply part 90 comprises a detergent containing portion 93 having a predetermined space or pocketdefined to allow the detergent supplied through the inlet 91 to be contained therein, and a siphon channel 94 through which the detergent in the detergent containing portion 93 is discharged along with the supplied water to the outlet 92.

[0073] The water supply device 100 comprises a water supply valve 102 for controlling water supply through an external hose 101, and a water supply hose 104 disposed to guide the water passing through the water supply valve 102 to the detergent supply part 90 when the door 60 is closed.

[0074] The water supply hose 104 is connected at one end to the water supply valve 102, passes through the through hole 55a of the cabinet cover 55, and protrudes at the other end from the front side ofthe though hole 55a.

[0075] Reference numeral 57 indicates a control panel mounted on an upper portion of the cabinet cover 55 for controlling the washing machine.

[0076] Operation of the washing machine constructed as described above will now be described.

[0077] First, when closing the door 60 after laundry m is inserted through the laundry entrance 5 1 into the drum 80, a portion of the water supply hose 104 passes through the insertion hole 65 of the door 60 and then communicates with the detergent supply part 90. The outlet 92 of the detergent supply part 90 is directed towards the inner portion of the drum 80.

[0078] After opening the inlet 91 of the detergent supply part 90 by pulling down the shutter 64 detergent D is loaded through the inlet 91, and is loaded in the detergent containing portion 93 of the detergent supply part 90.

[0079] After closing the inlet 90 of the detergent supply part 90 by rotating the shutter 64 in reverse, instructions of various processes such as a washing process, a rinsing process, a dewatering process and the like are input through the control panel 57. Then, the motor 79, the water supply valve 102, and the drainage pump 77 of the washing machine are operated according to the instructions.

[0080] When instructions for the washing process are input through the control panel 7, the water supply valve 102 of the washing machine is turned on.

[0081] Then, water supplied from the external hose 101 sequentially passes through the water supply valve 102 and the water supply hose 104, and is then supplied into the detergent supply part 90 where the water drops into the detergent containing portion 93 and dissolves the detergent D to form wash water w.

[0082] Then, the wash water w is supplied into the tub 70 or the drum 80 from the detergent containing portion 93 through the outlet 92 of the detergent supply part 90 via the siphon channel 94, and soaks into the laundry m.

[0083] When the wash water w is reduces a predetermined level in the tub 70, the water supply valve 102 is turned off, and the motor 79 is driven.

[0084] As the motor 79 is driven, the drum 80 is rotated, and the laundry m is agitated within in the drum 80, causing contaminants to be removed from the laundry m.

[0085] After the washing process is performed for a predetermined period, the motor 70 stops, and the drainage pump 77 is driven.

[0086] Then, the contaminated wash water w in the tub 70 sequentially passes through the drainage pipe 76, the drainage pump 77, and the drainage hose 78, and is then drained to the outside of the washing machine.

[0087] As with the washing process, when instructions for the rinsing process are input to the washing machine, the motor 79, the water supply valve 102, and the drainage pump 77 of the washing machine are operated according to the instructions.

[0088] When the water supply valve 102 of the washing machine is turned on, water is supplied from the external

hose 102, and sequentially passes through the water supply valve 102 and the water supply hose 104. Then, the water is supplied into the detergent supply part 90 where the water falls into and fills the detergent containing portion 93.

[0089] Then, the rinsing water w is supplied into the tub 70 or the drum 80 from the detergent containing portion 93 through the outlet 92 of the detergent supply part 90 via the siphon channel 94, and soaks into the laundry m.

[0090] When the rinsing water w reaches a predetermined level in the tub 70, the water supply valve 102 is turned off, and the motor 79 is driven.

[0091] As the motor 79 is driven, the drum 80 is rotated, and the laundry m is agitated within the drum 80, causing the detergent to be removed from the laundry.

[0092] After the rinsing process is performed for a predetermined period, the motor 79 stops, and the drainage pump 77 is driven.

[0093] Then, the contaminated rinsing water w in the tub 70 sequentially passes through the drainage pipe 76, the drainage pump 77, and the drainage hose 78, and is then drained to the outside of the washing machine.

[0094] Fig. 5 is a side sectional view illustrating the inner structure of a washing machine in accordance with a second embodiment of the invention, and Fig. 6 is a perspective view illustrating the washing machine of Fig. 5, with the door opened

[0095] As shown in Figs. 5 and 6, the washing machine according to the second embodiment comprises a door 60' which has an inlet 91' of a detergent supply part 90' formed in a rear side of the door 60' such that detergent D is input through the inlet 91' of the detergent supply part 90' after opening the door 60' in front of the washing machine. Other constructions and operations thereof are the same as those of the washing machine according to the first embodiment Thus, the other constructions are denoted by the same reference numerals as those of the first embodiment, and a detailed description thereof is omitted.

[0096] The door 60' comprises a front panel 66', and a rear panel 67' coupled to a rear side of the front panel 66'. The rear panel 67' is formed at an upper portion with the inlet 91' of the detergent supply part 90' and an insertion hole 65 through which a portion of a water supply device 100 is inserted, and is formed at a lower portion with an outlet 92 of the detergent supply part 90'.

[0097] Fig. 7 is a side sectional view illustrating the inner structure of a washing machine in accordance with a third embodiment, and Fig. 8 is a perspective view illustrating the washing machine in accordance with the third embodiment.

[0098] As shown in Figs. 7 and 8, the washing machine of the third embodiment has a door 60" which comprises a door frame 66" and 67" having a detergent supply part 90" and a hole formed therein, and a door glass 68" mounted to the hole and convexly formed to protrude towards the drum. Other constructions and operations thereof are the same as those of the washing machine according to the first and second embodiments. Thus, the other constructions are denoted by the same reference numerals as those of the first embodiment, and a detailed description thereof is omitted

[0099] The door frame comprises a front panel 66" and a rear panel 67" coupled to a rear side of the front panel 66". The front panel 66" has an inlet 91 of the detergent supply part 90" formed at an upper portion of the front panel 66". The rear panel 67" has an insertion hole 65 formed at an upper portion thereof so as to allow a portion of a water supply device 100 to be inserted thereinto. An outlet 92 of the detergent supply part 90" is formed at a lower portion of the rear panel 67".

[0100] It should be noted that the present invention is not limited to the embodiments as described above. Alternatively, the washing machine may comprise a facility for an additional additive, such as a fabric softener supply part in addition to the detergent supply part so that a fabric softener can be introduced and is then supplied together with water supplied from the outside into the tub during the rinsing process.

[0101] Alternatively, a space may be defined between the front panel and the rear panel constituting the door to receive an additional detergent drawer. The door may be equipped with an additional water supply hose for guiding water from the water supply device to this detergent drawer, and an additional guide hose for guiding the wash water or the rinsing water passing through this detergent drawer to the rear of the door.

[0102] A washing machine according to embodiments of the invention has the following advantages.

[0103] First, since the washing machine has the detergent supply part formed in the door, it has the advantage of considerable space saving compared with the washing machine having the detergent supply part arranged conventionally, thereby minimizing the volume and the number of components of the washing machine.

[0104] Second, the inlet and outlet of the detergent supply part are formed in the front and rear sides of the door, respectively, so that the detergent can be supplied/added to the washing machine when the door is closed, thereby enhancing user convenience.

[0105] Third, the inlet and outlet of the detergent supply part are formed in the rear side of the door, so that the detergent supply part is concealed, thereby enhancing the frontal appearance of the washing machine.

[0106] Fourth, in the washing machine according to the invention, the shutter for opening/closing the inlet of the detergent supply part is installed to the door, thereby preventing foreign matter from entering the detergent supply part and preventing water supplied through the water supply device from leaking out

[0107] Fifth, the door comprises the door frame having the detergent supply part and the hole formed therein, and the door glass mounted to the hole, so that the detergent can be supplied through the door frame and the inside of the washing machine can be seen through the

door glass.

[0108] It should be understood that the embodiments and the accompanying drawings as described above have been described for illustrative purposes and the present invention is limited by the following claims. The embodiments described are front loading machines, but the invention is not limited to such types and could equally well be applied to others. Further, those skilled in the art will appreciate that various modifications, additions and substitutions are allowed without departing from the scope of the invention as set forth in the accompanying claims.

Claims

1. A washing machine, comprising:

a cabinet having a laundry entrance formed therein;
a door 60 for the laundry entrance 51; and
an additive supply part formed in the door.

2. The washing machine as set forth in claim 1, wherein the supply part has an inlet formed in a front face of the door, and an outlet formed in a rear face of the door.

3. The washing machine as set forth in claim 2, wherein the door is provided with a shutter for opening/closing the inlet.

4. The washing machine as set forth in claim 2, wherein the rear of the door has a central portion protruding into the cabinet, and the outlet 92 is formed in the central portion.

5. The washing machine as set forth in claim 1, wherein the supply part has an inlet and an outlet formed in a rear face of the door.

6. The washing machine as set forth in claim 1, wherein the door comprises a door frame having the supply part and a hole formed in the frame, and a door glass mounted to the hole.

7. The washing machine as set forth in any one of claims 1 to 6, further comprising: a water supply device arranged to communicate with the supply part when the door 60 is closed for supplying water..

8. The washing machine as set forth in claim 7, wherein the water supply device comprises a water supply valve for controlling water supply from an external source, and a water supply hose 104 arranged to guide water from the water supply valve 102 to the supply part 90; 90'; 90" when the door 60 is closed.

9. The washing machine as set forth in claim 7, wherein the supply part comprises an additive containing portion having a predetermined space defined to contain the additive supplied through the inlet to be contained therein, and a siphon channel through which the additive in the containing portion is discharged along with supplied water to the outlet

10. A washing machine as set forth in any of claims 1 to 9 in which the door is arranged for front loading.

FIG. 1 (Prior Art)

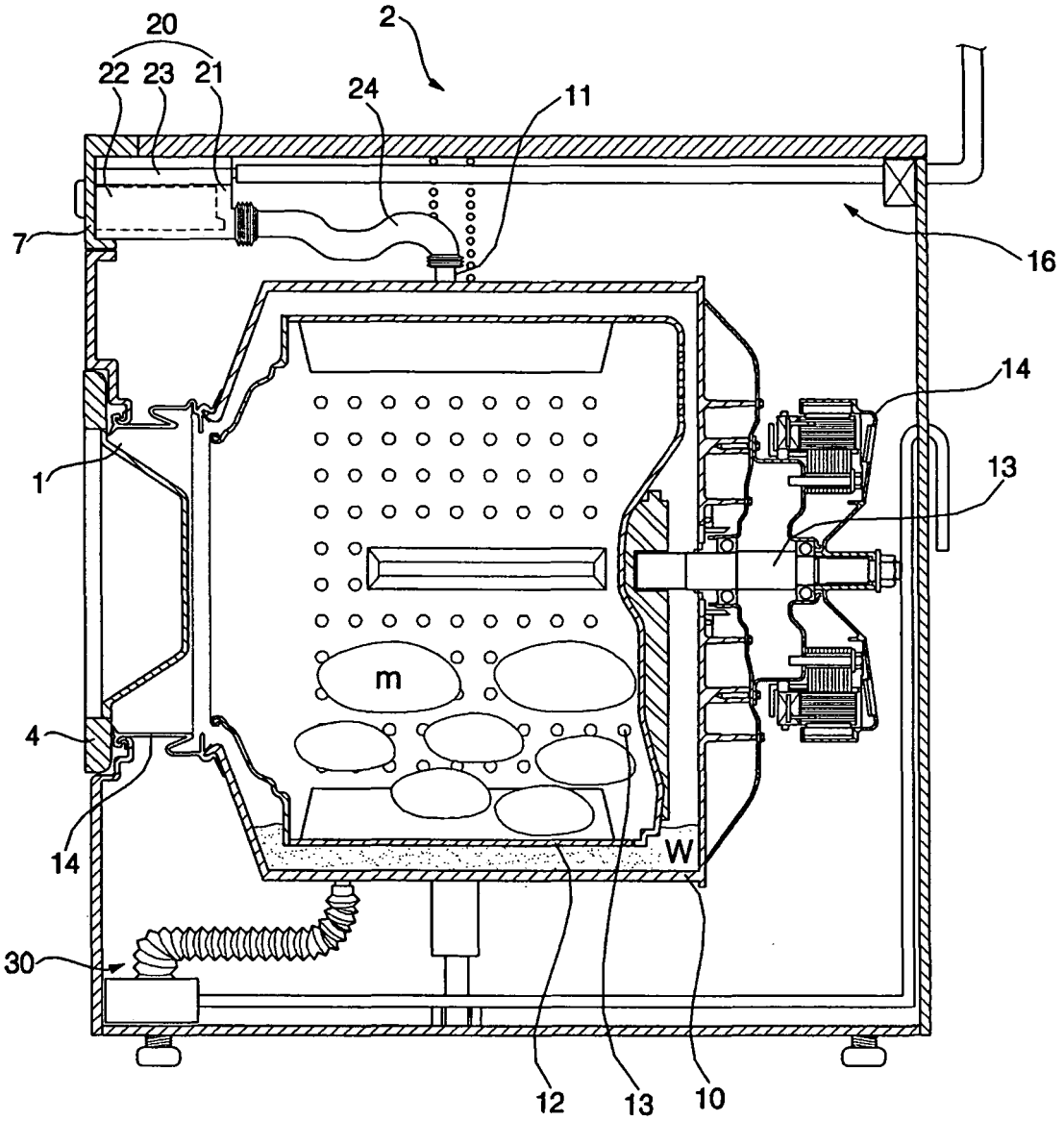


FIG. 2 (Prior Art)

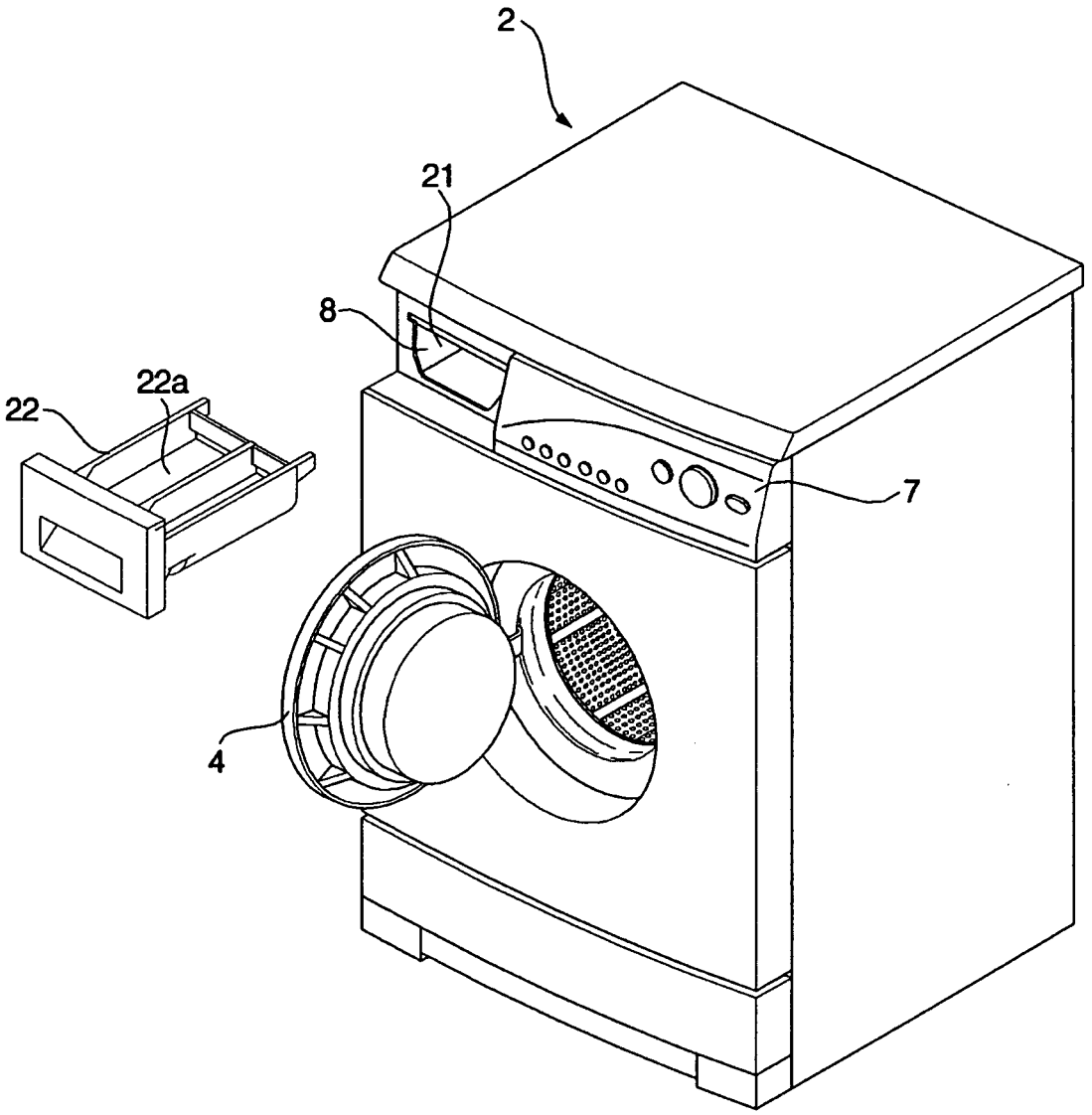


FIG. 3

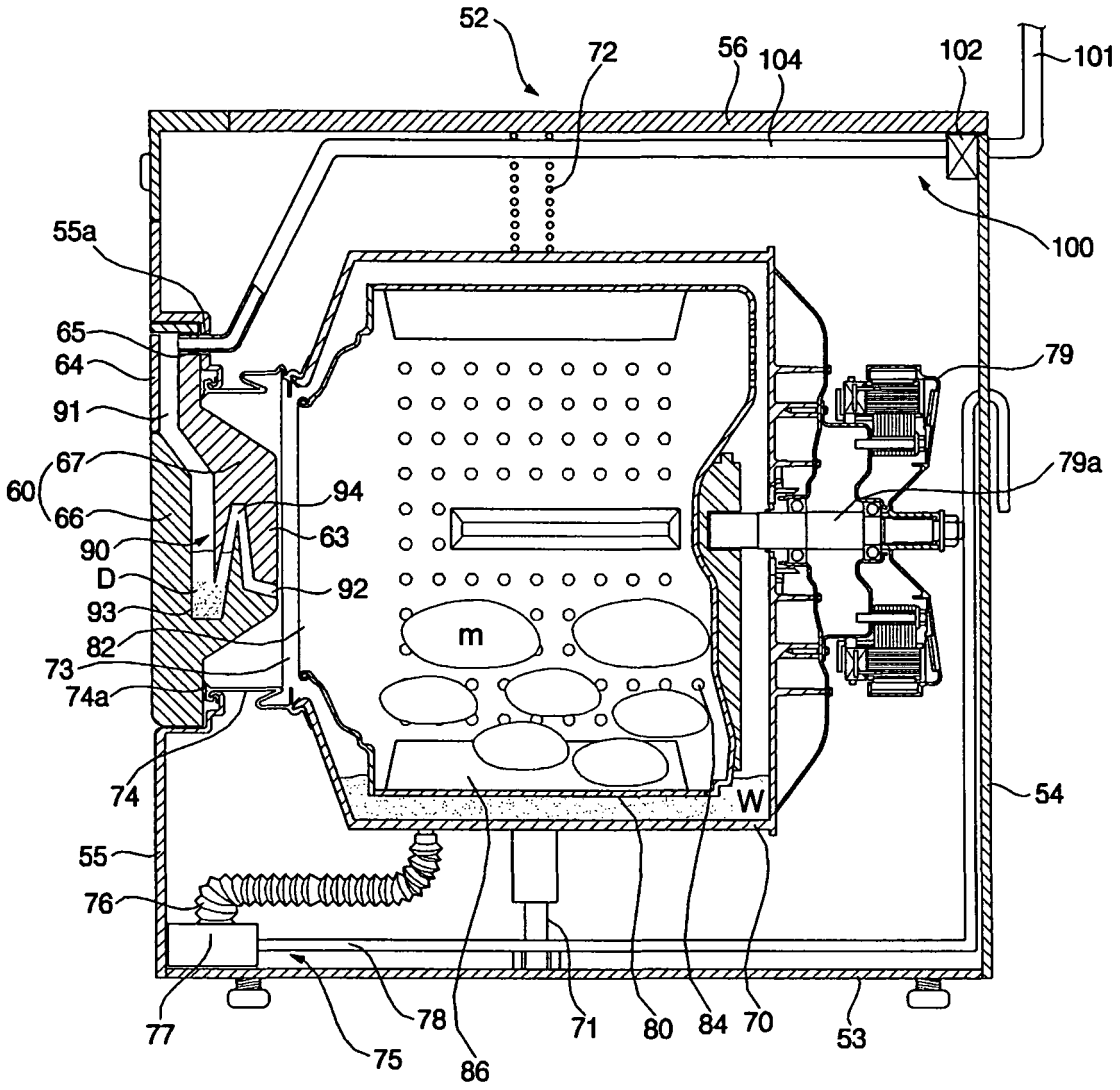

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FIG. 4

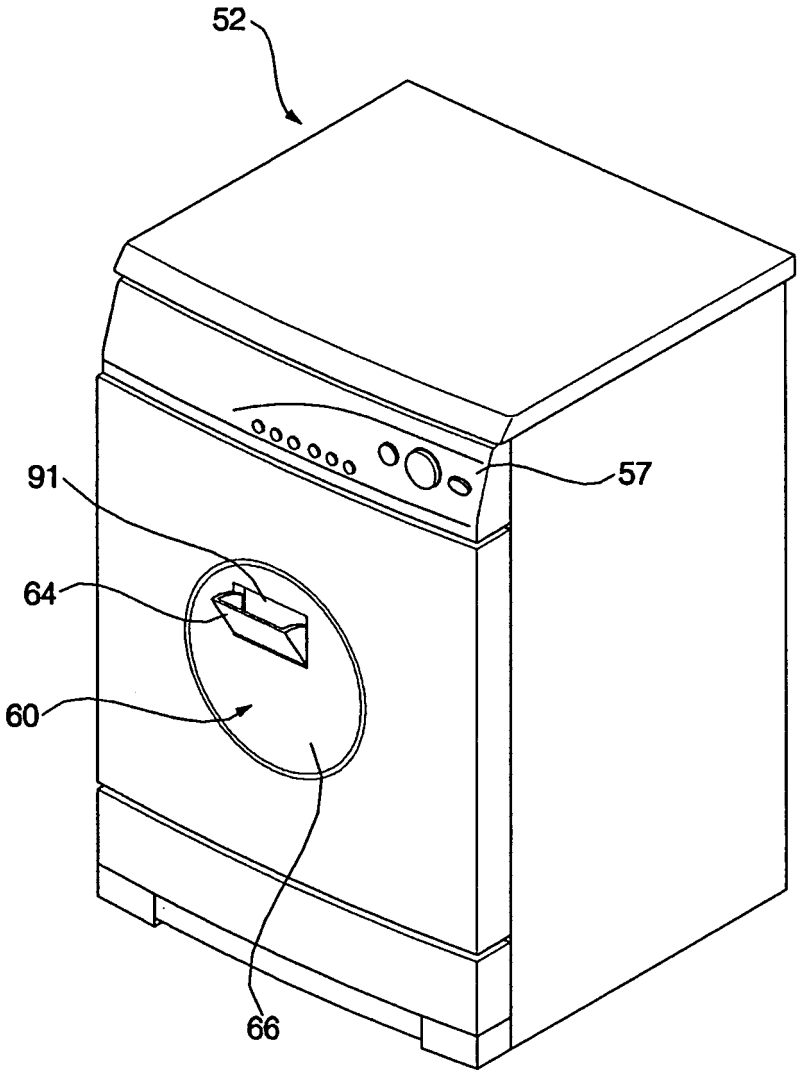
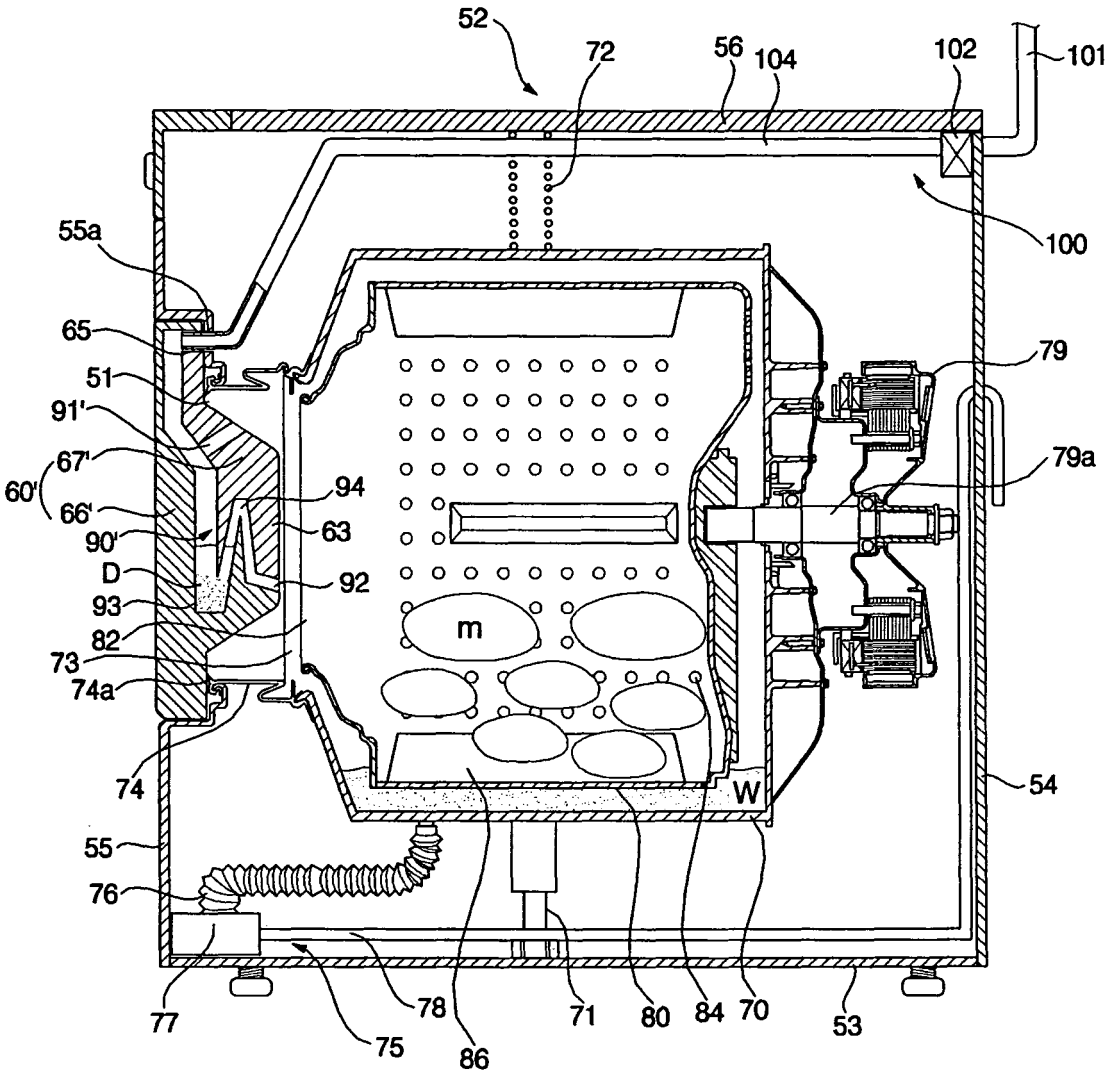


FIG. 5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92
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79a

FIG. 6

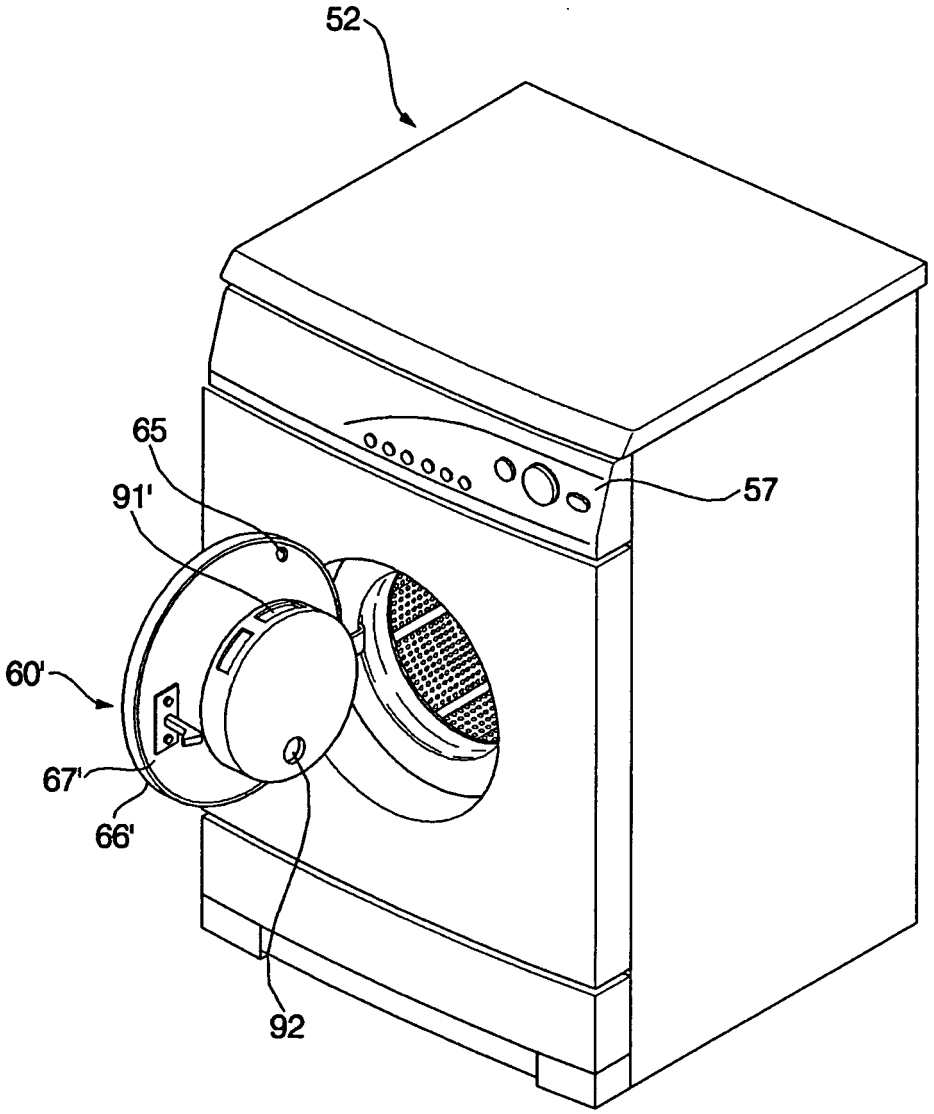
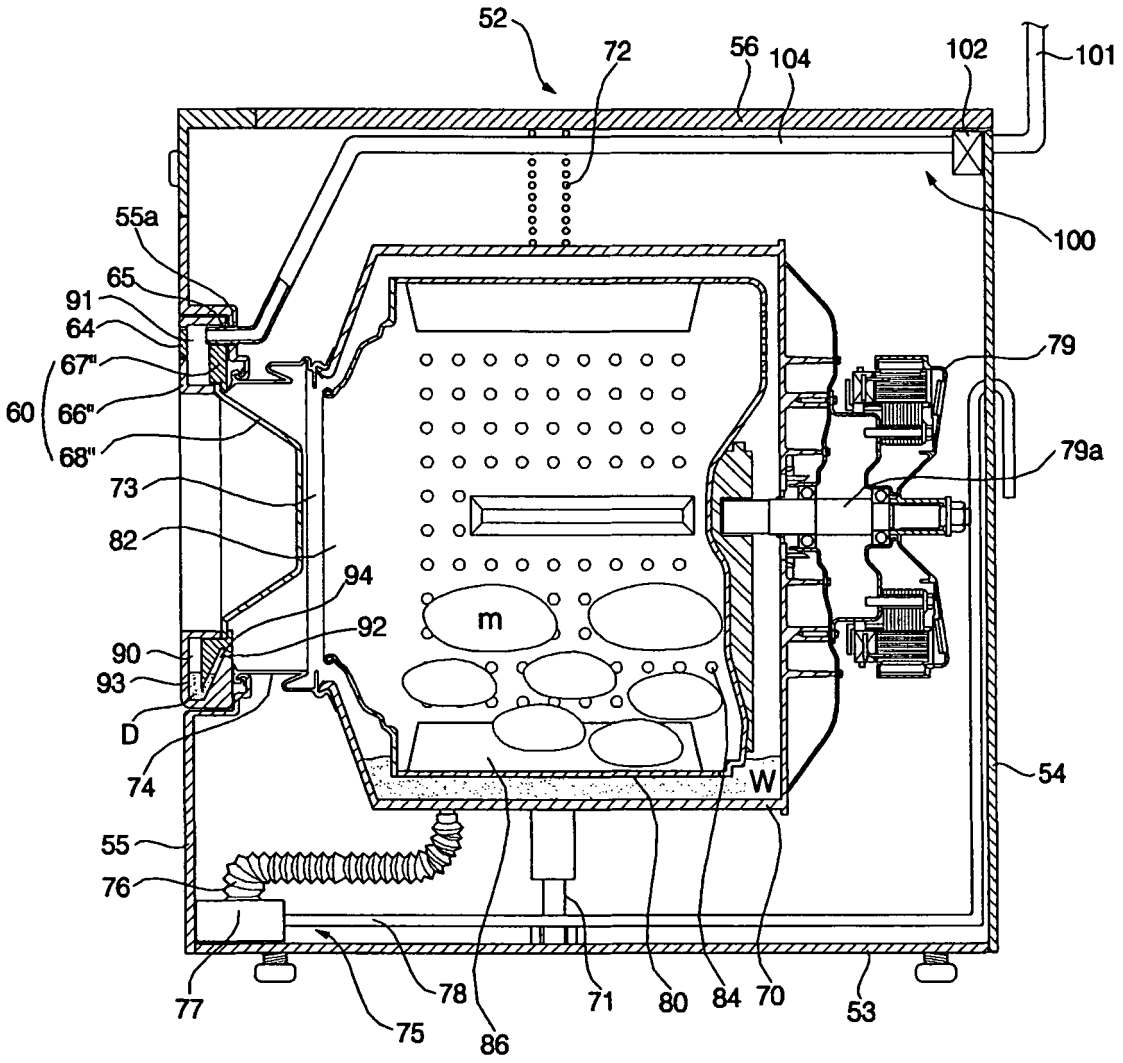


FIG. 7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72
56
104
102
101
100
55a
65
91
64
67"
60
66"
68"
73
82
94
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93
D
74
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W
m
79
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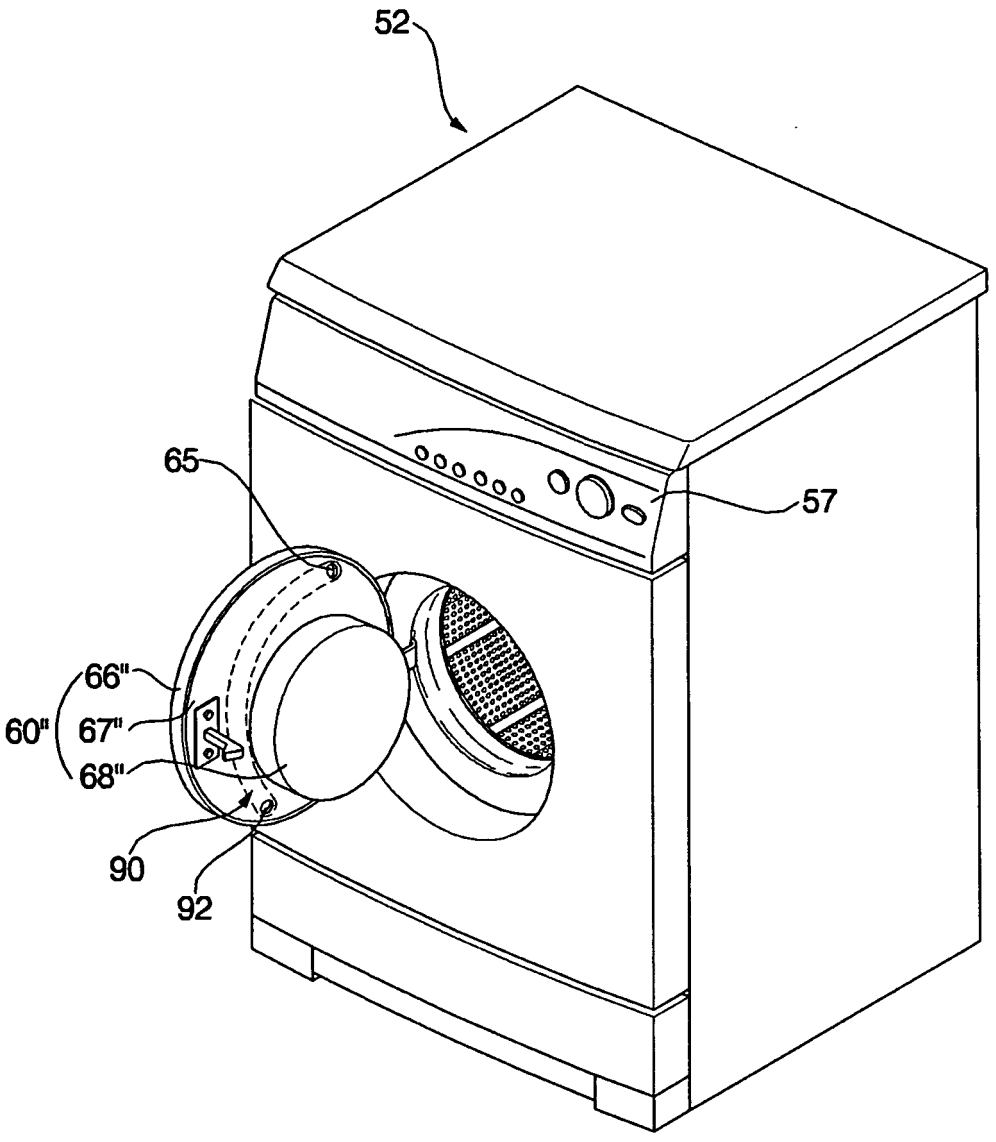
FIG. 8



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Application Number
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Place of search	Date of completion of the search	Examiner
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