

## DESCRIPTION

### WASHING MACHINE

#### 5 TECHNICAL FIELD

[0001]

The present disclosure relates to a washing machine equipped with a detergent put-in device.

#### 10 BACKGROUND ART

[0002]

Conventionally, in the detergent put-in device of this type of washing machine, a liquid detergent or a liquid finishing agent is put in a washing tub by making use of a siphoning action (see PTLs 1 and 2, for example).

15 [0003]

FIG. 5 is a longitudinal cross-sectional view of a detergent put-in device of the first conventional washing machine described in PTL 1. As illustrated in FIG. 5, the inside of detergent automatic put-in device 101 is provided with soap powder chamber A and chamber B in which a liquid  
20 detergent and chemicals are stored. Both chambers A, B are partitioned by partition plate 102, and water supply port 103 is mounted on chamber B. Inverse U-shaped narrow diameter pipe 105 is disposed such that a top surface of narrow diameter pipe 105 is located at a position slightly lower than a height of partition plate 102. One end of narrow diameter pipe 105 is  
25 disposed near a bottom surface of chamber B. Other end of narrow diameter pipe 105 projects outside from the bottom surface of chamber B, and a hose is connected to a distal end of narrow diameter pipe 105 thus introducing water

supplied from water supply port 103 into the washing tub.

[0004]

In the detergent put-in device of the above-mentioned first conventional washing machine, recess 101b having a small volume is formed on a bottom surface portion near the partition plate on a discharge port side of chamber B. Recess 101c is disposed adjacently to recess 101b for allowing narrow diameter pipe 105 to penetrate the bottom surface portion in a state where narrow diameter pipe 105 is sealed by means of rubber packing 106. Through hole 104 is formed in a center portion of recess 101c.

[0005]

One end 105a of narrow diameter pipe 105 is positioned at a center portion of recess 101b. The other end 105b side of narrow diameter pipe 105 is made to pass through through hole 104 formed in recess 101c in a state where narrow diameter pipe 105 is sealed by means of rubber packing 106, and is connected to hose 107 outside detergent automatic put-in device 101 so that narrow diameter pipe 105 is joined to the washing tub.

[0006]

With such a configuration, when a washing operation advances to a step where a liquid detergent or a liquid finishing agent is put into the washing tub, water is automatically supplied into chamber B from water supply port 103, and a level of water in chamber B gradually rises. Then, the liquid flows out through narrow diameter pipe 105 mounted at a position lower than height h of partition plate 2, and the liquid enters the washing tub. In this case, a water supply amount is larger than an amount of water which flows out through narrow diameter pipe 105, the level of water in chamber B further rises, and the liquid gets over partition plate 102 and is transferred into chamber A, and is put into the washing tub from discharge port 108.

[0007]

Then, when a put-in time is finished so that the supply of water is stopped, the outflow of the liquid which is overflowing from partition plate 102 is stopped. The liquid left in chamber B continuously flows into the washing  
5 tub through narrow diameter pipe 105 due to a siphoning action. Then, the liquid in chamber B which includes an amount of the liquid left on a bottom portion is sucked out.

[0008]

FIG. 6 is a perspective view of a detergent put-in device of a second  
10 conventional washing machine described in PTL 2. FIG. 7 is a longitudinal cross-sectional view of the detergent put-in device of the washing machine. As illustrated in FIG. 6 and FIG. 7, detergent storing container 121 includes powder detergent storing portion 122 which stores a powder synthetic detergent, a liquid detergent storing portion 123 which stores a liquid  
15 detergent or liquid bleach, and liquid finishing agent storing portion 124 which stores a liquid finishing agent. Storing portion lid plate 125 covers liquid detergent storing portion 123 and liquid finishing agent storing portion 124 from above, and liquid detergent receiving port 125a and liquid finishing agent receiving port 125b respectively open in storing portion lid plate 125 at  
20 positions which opposingly face liquid detergent storing portion 123 and liquid finishing agent storing portion 124. On bottom portions of liquid detergent storing portion 123 and liquid finishing agent storing portion 124, liquid detergent put-in port 123b and second introducing passage 124b having a pipe shape are formed in an upwardly erected manner respectively. Storing  
25 portion lid plate 125 has two pipe-shaped projecting portions 125c which are formed in a downwardly erected manner. One pipe-shaped projecting portion 125c is a circular cylindrical projecting portion which covers liquid detergent

put-in port 123b from the outside and has a lower end which reaches an area near a bottom surface of liquid detergent storing portion 123. The other pipe-shaped projecting portion 125c is a circular cylindrical projecting portion which covers second introducing passage 124b from the outside and has a lower end which reaches an area near a bottom surface of second introducing passage 124b. Liquid detergent put-in port 123b and pipe-shaped projecting portion 125c form a siphon passage, and second introducing passage 124b and pipe-shaped projecting portion 125c also form a siphon passage.

[0009]

With such a configuration, in a washing step, water passes through water pouring passage 131 formed in water supply member 130, and water is poured into powder detergent storing portion 122 and liquid detergent storing portion 123 from water pouring port 133 formed in a lower surface of water supply member 130. Further, in a rinsing step, water is poured into liquid finishing agent storing portion 124 from water pouring port 134. In a washing step, a detergent liquid which is produced by diluting and dispersing a powder synthetic detergent in powder detergent storing portion 122 is supplied into a water tub (not illustrated in the drawing) through detergent liquid supply passage 141 and a water supply passage (not illustrated in the drawing). A detergent liquid which is produced by diluting and dispersing a liquid detergent in liquid detergent storing portion 123 is supplied to the water tub through the siphon passage, detergent liquid supply passage 141, and the water supply passage (not illustrated in the drawing) based on a principle of siphon.

[0010]

After pouring of water from water pouring port 133 is finished, water flows out from liquid detergent storing portion 123 by a siphoning operation.

After such a water outflow operation is finished, residual water remains in liquid detergent storing portion 123. This is residual water remaining in the siphon passage portion at the time of completion of the siphoning operation, and an amount of residual water is an amount corresponding to a volume of the siphon passage up to liquid detergent put-in port 124b.

[0011]

In the rinsing step, a finishing liquid produced by diluting and dispersing a liquid finishing agent in liquid finishing agent storing portion 124 is supplied to the water tub through detergent liquid supply passage 141 and the water supply passage (not illustrated in the drawing) in the same manner. In such a step, residual water remains also in liquid finishing agent storing portion 124 in the same manner.

[0012]

However, with the configuration described in PTL1, narrow diameter pipe 105 which generates a siphoning action is a pipe having a narrow diameter and hence, narrow diameter pipe 105 might be clogged by a stock liquid of a liquid detergent or a liquid finishing agent having high viscosity or by a foreign substance which enters narrow diameter pipe 105. Disassembling of the washing machine in a large scale must be performed to clean narrow diameter pipe 105 and hence, there exists a problem that such a cleaning extremely takes time and effort.

[0013]

Further, with the configuration described in PTL 2, a gap between liquid detergent put-in port 123b or second introducing passage 124b and pipe-shaped projecting portion 125c which forms a pair with liquid detergent put-in port 123b or second introducing passage 124b is generally narrow such as approximately 2 mm. Accordingly, although there arises no problem with

respect to a usual liquid detergent and liquid finishing agent, when a foreign particular liquid detergent or liquid finishing agent having high viscosity is used, water does not smoothly flow out from the siphon passage when water is poured. Therefore, there exists a problem that a stock liquid of the liquid  
5 detergent or the liquid finishing agent and a large amount of water which dilutes the stock liquid remains in the detergent storing container.

[0014]

On the other hand, when the gap of the siphon passage is expanded so as to cope with such a problem, after the siphoning operation is finished, an  
10 amount of residual water in the detergent storing container increases. Therefore, there exists a problem that water remains in liquid detergent put-in port 123b and second introducing passage 124b.

#### Citation List

##### Patent Literature

15 [0015]

PTL 1: Registered utility model No. 3033029

PTL 2: Unexamined Japanese Patent Publication No. 2004-313318

#### SUMMARY

20 [0016]

The present disclosure solves the above-mentioned conventional problems, and embodiments provide a washing machine that can easily treat clogging of a foreign substance and simultaneously can put in a liquid detergent or a liquid finishing agent having high viscosity while reducing an  
25 amount of residual water after a siphoning operation is finished.

[0017]

In an aspect, a washing machine of the present disclosure includes a water tub, and a detergent put-in device that puts a liquid or a mixture in a liquid form into the water tub. The detergent put-in device includes a liquid storing portion capable of storing the liquid or the mixture in a liquid form, and a storing portion lid plate that partially or wholly covers an upper portion of the liquid storing portion. Further, the detergent put-in device has a first introducing passage that is formed in a cylindrical shape in the liquid storing portion and has a lower end portion which opens near a bottom portion of the liquid storing portion, an introducing passage joint portion that is connected to an upper end portion of the first introducing passage and is formed in an inverse U shape, and a second introducing passage that is formed in a cylindrical shape, has one end which is connected to the introducing passage joint portion, and has the other end which opens toward the outside of the bottom portion of the liquid storing portion. A liquid put-in passage is formed by the first introducing passage, the introducing passage joint portion, and the second introducing passage that are communicated with each other as one passage, and the liquid put-in passage is partially formed by the storing portion lid plate, and the storing portion lid plate is capable of being taken out from the liquid storing portion. In the above-mentioned configuration, “cylindrical shape” also includes “approximately cylindrical shape”.

[0018] With such a configuration, clogging of a foreign substance can be easily treated and simultaneously a liquid detergent or a liquid finishing agent having high viscosity can be put in while an amount of residual water is reduced after a siphoning operation is finished.

[0019]

The washing machine of the present disclosure equipped with a

detergent storing container can easily treat clogging of a foreign substance and simultaneously can put in a particular liquid detergent or a particular liquid finishing agent having high viscosity while reducing an amount of residual water after a siphoning operation is finished.

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## BRIEF DESCRIPTION OF DRAWINGS

[0020]

FIG. 1 is a longitudinal cross-sectional view of a washing machine according to a first exemplary embodiment of the present invention.

10        FIG. 2 is a longitudinal cross-sectional view of a detergent put-in device of the washing machine.

FIG. 3 is an exploded perspective view of a detergent storing container of the washing machine.

15        FIG. 4A is a longitudinal cross-sectional side view of a main portion of the detergent storing container portion of the washing machine.

FIG. 4B is a transverse cross-sectional plan view of the main portion of the detergent storing container portion of the washing machine.

FIG. 5 is a longitudinal cross-sectional view of a detergent put-in device of a first conventional washing machine.

20        FIG. 6 is a perspective view of a detergent put-in device of a second conventional washing machine.

FIG. 7 is a longitudinal cross-sectional view of the detergent put-in device of the washing machine.

## 25    DESCRIPTION OF EMBODIMENT

[0021]

According to the first disclosure, a washing machine of the present

disclosure includes a water tub, and a detergent put-in device that puts a liquid or a mixture in a liquid form into the water tub. The detergent put-in device includes a liquid storing portion capable of storing the liquid or the mixture in a liquid form, and a storing portion lid plate that partially or wholly covers an upper portion of the liquid storing portion. Further, the detergent put-in device has a first introducing passage that is formed in a cylindrical shape in the liquid storing portion and has a lower end portion opening near a bottom portion of the liquid storing portion, an introducing passage joint portion that is connected to an upper end portion of the first introducing passage and is formed in an inverse U shape, and a second introducing passage that is formed in a cylindrical shape, has one end connected to the introducing passage joint portion, and has the other end opening toward the outside of the bottom portion of the liquid storing portion. A liquid put-in passage is formed by the first introducing passage, the introducing passage joint portion, and the second introducing passage that are communicated with each other as one passage, and the liquid put-in passage is partially formed by the storing portion lid plate. In the above-mentioned configuration, “cylindrical shape” also includes “approximately cylindrical shape”.

[0022]

With such a configuration, clogging of a foreign substance can be easily treated and simultaneously a liquid detergent or a liquid finishing agent having high viscosity can be put in while an amount of residual water is reduced after a siphoning operation is finished.

[0023]

According to a second disclosure, the liquid storing portion includes one first introducing passage, one introducing passage joint portion, and the second introducing passage which are integrally formed with each other, and

the storing portion lid plate includes the other first introducing passage and the other introducing passage joint portion that are integrally formed with each other.

[0024]

5           With such a configuration, even when an inside of the liquid put-in passage is clogged by a foreign substance, the foreign substance can be easily cleaned by removing the storing portion lid plate.

[0025]

10           Although an exemplary embodiment of the present disclosure is described with reference to drawings hereinafter, the present invention is not limited by the exemplary embodiment.

[0026]

#### FIRST EXEMPLARY EMBODIMENT

15           FIG. 1 is a longitudinal cross-sectional view of a washing machine according to a first exemplary embodiment of the present invention. FIG. 2 is a longitudinal cross-sectional side view of a frame body portion of a detergent put-in portion of the washing machine. FIG. 3 is an exploded perspective view of the structure of the frame body portion of the detergent put-in portion of the washing machine. FIG. 4A is a longitudinal cross-sectional side view of a main portion of a detergent storing container portion of the washing machine. 20           FIG. 4B is a transverse cross-sectional plan view of the main portion of the detergent storing container portion of the washing machine.

[0027]

25           The structure of washing machine 1 is described with reference to FIG. 1. Water tub 3 is disposed in washing machine housing 2 in a suspended state by a suspension structure not illustrated in the drawing and vibration proof devices 6. Rotary drum 4 formed in a bottomed cylindrical shape is

disposed in water tub 3. Rotary drum 4 is rotatably driven in a normal rotational direction and a reverse rotational direction about an axis of rotation inclined frontwardly and upwardly in such a manner that power is transmitted to impeller pulley 5 mounted on rotary drum 4 from a motor not  
5 illustrated in the drawing which is mounted on a back surface side of water tub 3 by way of belt 9. Detergent put-in device 10 that is connected to water supply valve 7 and stores a powder synthetic detergent, a liquid detergent, and a liquid finishing agent is disposed on an upper portion of washing machine housing 2. Detergent put-in device 10 is connected to water tub 3 by water  
10 supply hose 11 formed by a bellows rubber body. The axis of rotation of rotary drum 4 is inclined frontwardly and upwardly in the present exemplary embodiment. However, the axis of rotation may extend in an approximately horizontal direction.

[0028]

15 Detergent put-in device 10 includes detergent put-in portion frame body 40 that is a bottomed box body having an approximately U-shaped cross section and having an opening on an upper side, detergent storing container 20 that stores a detergent and water supply member 30 that is provided with water supply passage 31 connected to water supply valve 7 and supplies water  
20 to detergent storing container 20.

[0029]

Detergent put-in portion frame body 40 is disposed below water supply member 30. Detergent storing container 20 is accommodated in space portion 40a formed between detergent put-in portion frame body 40 and water supply  
25 member 30 in a state where detergent storing container 20 can be taken out from above. Water supply hose 11 is connected to water tub 3 at a rear-side bottom portion of detergent put-in portion frame body 40.

[0030]

In FIG. 2, detergent storing container 20 is accommodated in space portion 40a surrounded by detergent put-in portion frame body 40 and water supply member 30 in a state where detergent storing container 20 can be taken out from above. Water supply member 30 includes water supply passage 31 that functions as a water flow passage for supplying water to detergent storing container 20, and water pouring port 33 provided with a large number of small holes formed in a bottom surface of water supply passage 31.

[0031]

Water supplied from water pouring port 33 is mixed with a detergent (a powder synthetic detergent, a liquid detergent, a liquid finishing agent or the like) stored in detergent storing container 20, and thus various kinds of detergent mixed liquids are generated. Detergent put-in portion frame body 40 has detergent liquid supply passage 41 that is integrally formed on a bottom portion of detergent put-in portion frame body 40. Various kinds of detergent mixed liquids are supplied into water tub 3 through detergent liquid supply passage 41 and water supply hose 11 connected to detergent liquid supply passage 41.

[0032]

In FIG. 2 and FIG. 3, detergent storing container 20 is accommodated in detergent put-in portion frame body 40 in a state where detergent storing container 20 can be taken out from above. Detergent storing container 20 includes powder detergent storing portion 22 that stores a powder synthetic detergent, liquid detergent storing portion 23 that stores a liquid detergent or liquid bleach, and a liquid finishing agent storing portion (liquid storing portion) 24 that stores a liquid finishing agent.

[0033]

Water supply member 30 includes water supply passage 31 configured by thermally welding two resin formed plates made of a polypropylene resin or the like to each other. Water supply passage 31 includes first water supply  
5 passage 31a that supplies water to powder detergent storing portion 22 and liquid detergent storing portion 23, and second water supply passage 31b that supplies water to liquid finishing agent storing portion 24. During a washing step and a rinsing step before a final step, water is supplied to powder detergent storing portion 22 and liquid detergent storing portion 23 from first  
10 water supply passage 31a. Then, during the final rinsing step, water is supplied to liquid finishing agent storing portion 24 from second water supply passage 31b.

[0034]

Powder detergent put-in passage 22a is formed downstream of powder  
15 detergent storing portion 22. Liquid detergent put-in passage 23a is formed on an outer bottom portion of liquid detergent storing portion 23 on a downstream side. Liquid finishing agent put-in passage (liquid put-in passage) 24a is formed on an outer bottom portion of liquid finishing agent storing portion 24 on a downstream side. Detergent put-in device 10 is  
20 configured such that all detergents stored in powder detergent storing portion 22, liquid detergent storing portion 23, and liquid finishing agent storing portion 24 are diluted by water supplied from water supply valve 7, and detergent liquids flow into detergent liquid supply passage 41 from space portion 40a.

25 [0035]

The configurations of liquid finishing agent storing portion 24 and liquid finishing agent put-in passage 24a are described in details with

reference to FIG. 3, FIG. 4A, and FIG. 4B.

[0036]

Storing portion lid plate 25 that partially or wholly covers liquid finishing agent storing portion 24 is detachably mounted on an upper portion of liquid finishing agent storing portion 24. Second introducing passage 26 having an approximately cylindrical shape is formed on a bottom portion of liquid finishing agent storing portion 24 in an upwardly erected manner. Lower end portion 26a of second introducing passage 26 opens outwardly on the bottom portion of liquid finishing agent storing portion 24, and an upper end portion 26b of second introducing passage 26 opens upwardly. One end 27a of introducing passage joint portion 27 formed in an inverse U shape is connected to upper end portion 26b of second introducing passage 26.

[0037]

First introducing passage 28 is disposed in liquid finishing agent storing portion 24 approximately parallel to second introducing passage 26. First introducing passage 28 is formed in an approximately cylindrical shape. Lower end portion 28a of first introducing passage 28 opens near the bottom portion of liquid finishing agent storing portion 24. Upper end portion 28b of first introducing passage 28 is connected to the other end 27b of introducing passage joint portion 27.

[0038]

In this manner, liquid finishing agent put-in passage 24a is formed in an approximately U shape and in an approximately cylindrical shape by first introducing passage 28, introducing passage joint portion 27, and second introducing passage 26. That is, liquid finishing agent put-in passage 24a is formed by one continuous passage which is elevated from an area near the bottom portion of liquid finishing agent storing portion 24 and, thereafter, is

lowered downwardly, and extends outside the bottom portion. Further, liquid finishing agent storing portion 24 is configured such that recessed portion 24b is formed near lower end portion 28a of first introducing passage 28 in liquid finishing agent storing portion 24 (see FIG. 3), and lower end portion 28a enters recessed portion 24b.

[0039]

As described previously, in liquid finishing agent storing portion 24, second introducing passage 26 is formed integrally with liquid finishing agent storing portion 24. One introducing passage joint portion 27c (having a semicircular cross section in a direction perpendicular to liquid finishing agent put-in passage 24a) that forms a lower half portion of introducing passage joint portion 27, and one first introducing passage 28c (having a semicircular cross section in a direction perpendicular to liquid finishing agent put-in passage 24a) that forms a rear half portion of first introducing passage 28 are formed integrally with second introducing passage 26 by being connected to each other by connecting portions 29 disposed on left and right sides.

[0040]

Detachable storing portion lid plate 25 is provided integrally with the other introducing passage joint portion 27d (having a semicircular cross section in a direction perpendicular to liquid finishing agent put-in passage 24a) that forms an upper half portion of introducing passage joint portion 27 and the other first introducing passage 28d (having a semicircular cross section in a direction perpendicular to liquid finishing agent put-in passage 24a) that forms a front half portion of first introducing passage 28 in a state where storing portion lid plate 25 is mounted on liquid finishing agent storing portion 24. Storing portion lid plate 25 includes ceiling surface portion 25a that forms a ceiling surface integrally with the other introducing passage joint

portion 27d and the other first introducing passage 28d, outer shell portion 25b that covers connecting portions 29 and second introducing passage 26 from the outside, and tab portion 25c that is formed on ceiling surface portion 25a and is held by a user when the user mounts or removes storing portion lid plate 25.

5 [0041]

When storing portion lid plate 25 is mounted on liquid finishing agent storing portion 24, introducing passage joint portion 27 is formed by one introducing passage joint portion 27c and the other introducing passage joint portion 27d, and first introducing passage 28 is formed by one first introducing passage 28c and the other first introducing passage 28d.

[0042]

The present exemplary embodiment has described the configuration where one introducing passage joint portion 27c forms the lower half portion of introducing passage joint portion 27. However, the present invention is not limited to such a configuration. That is, it is not always necessary that one introducing passage joint portion 27c forms the half portion of introducing passage joint portion 27, and it is sufficient that one introducing passage joint portion 27c forms a part of introducing passage joint portion 27. The same goes for one first introducing passage 28c, the other introducing passage joint portion 27d, and the other first introducing passage 28d.

[0043]

As described above, storing portion lid plate 25 can be taken out from liquid finishing agent storing portion 24 and hence, clogging or smear in liquid finishing agent put-in passage 24a can be easily cleaned.

25 [0044]

In the washing machine having the above-mentioned configuration, the manner of putting in a liquid finishing agent is described. A proper amount of

liquid finishing agent is put in liquid finishing agent storing portion 24 before starting washing, and water is supplied to liquid finishing agent storing portion 24 from second water supply passage 31b in the final rinsing step. Supplied water is partially or wholly mixed with a liquid finishing agent, and  
5 thus diluted water is produced. With a supply of water, a water level of diluted water in liquid finishing agent storing portion 24 rises, and diluted water is sucked into first introducing passage 28. Along with the progress of the supply of water, diluted water overflows introducing passage joint portion 27 so that diluted water starts flowing toward second introducing passage 26.  
10 Then, diluted water falls down from lower end portion 26a toward a lower side of liquid finishing agent storing portion 24 so that a siphoning operation is started. Even if the supply of water is finished, the start of the siphoning operation causes diluted water in liquid finishing agent storing portion 24 to continuously flow out. When no diluted water to be sucked in liquid finishing  
15 agent storing portion 24 remains, air enters second introducing passage 26 and introducing passage joint portion 27 so that the siphoning operation is finished. Diluted water remaining in first introducing passage 28 becomes residual water after finishing of the siphoning operation.

[0045]

20 It is desirable that a bottom surface of liquid finishing agent storing portion 24 be inclined such that a portion of the bottom surface of liquid finishing agent storing portion 24 which opposingly faces lower end portion 28a as an opening portion of first introducing passage 28 becomes a lowest portion. This is because by inclining the bottom surface of liquid finishing  
25 agent storing portion 24, diluted water is collected to a position which opposingly faces lower end portion 28a as the opening portion of first introducing passage 28 of liquid finishing agent storing portion 24 so that

diluted water is more easily sucked up by a siphoning operation. Recessed portion 24b formed on liquid finishing agent storing portion 24 enables diluted water to be collected to recessed portion 24b, and thus an amount of residual water can be reduced.

5 [0046]

According to the configuration of liquid finishing agent storing portion 24 of the present disclosure, a cross-sectional area of first introducing passage 28 is approximately 40 mm<sup>2</sup> and hence, an amount of residual water is halved to approximately 2.5 cc. Further, an inner diameter of the first introducing  
10 passage may be set to approximately 7 mm and hence, even a liquid agent having high viscosity is enabled to flow through the first introducing passage. Still further, by increasing the inner diameter of first introducing passage 28, a flow speed is also increased, and thus the accumulation of smear in first introducing passage 28 can be also suppressed.

15 [0047]

As described above, the present exemplary embodiment has described the example where the present invention is applied to the configuration of the siphon of the liquid finishing agent storing portion of the drum type washing machine. However, the substantially same advantageous effects can be  
20 achieved even when the liquid detergent storing portion has substantially the same configuration. Further, the present invention is applicable to not only an inclined drum type washing machine where an axis of rotation of a rotary drum is inclined with respect to a horizontal but also washing machines where a rotary drum is disposed approximately horizontally or vertically.

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## INDUSTRIAL APPLICABILITY

[0048]

As described above, a washing machine of the present disclosure can put in a liquid detergent or a liquid finishing agent having high viscosity while reducing an amount of residual water after finishing of a siphoning operation. Thus, the washing machine is useful as a washing machine equipped with a  
5 detergent storing container having a liquid detergent storing portion and a liquid finishing agent storing portion or the like.

## REFERENCE MARKS IN THE DRAWINGS

[0049]

|    |     |                                        |
|----|-----|----------------------------------------|
| 10 | 1   | washing machine                        |
|    | 2   | washing machine housing                |
|    | 3   | water tub                              |
|    | 4   | rotary drum                            |
|    | 7   | water supply valve                     |
| 15 | 10  | detergent put-in device                |
|    | 11  | water supply hose                      |
|    | 20  | detergent storing container            |
|    | 22  | powder detergent storing portion       |
|    | 22a | powder detergent put-in passage        |
| 20 | 23  | liquid detergent storing portion       |
|    | 23a | liquid detergent put-in passage        |
|    | 24  | liquid finishing agent storing portion |
|    | 24a | liquid finishing agent put-in passage  |
|    | 24b | recessed portion                       |
| 25 | 25  | storing portion lid plate              |
|    | 25a | ceiling surface portion                |
|    | 25b | outer shell portion                    |

|    |     |                                             |
|----|-----|---------------------------------------------|
|    | 25c | tab portion                                 |
|    | 26  | second introducing passage                  |
|    | 26a | lower end portion                           |
|    | 26b | upper end portion                           |
| 5  | 27  | introducing passage joint portion           |
|    | 27a | one end                                     |
|    | 27b | the other end                               |
|    | 27c | one introducing passage joint portion       |
|    | 27d | the other introducing passage joint portion |
| 10 | 28  | first introducing passage                   |
|    | 28a | lower end portion                           |
|    | 28b | upper end portion                           |
|    | 28c | one first introducing passage               |
|    | 28d | the other first introducing passage         |
| 15 | 29  | connecting portion                          |
|    | 30  | water supply member                         |
|    | 31  | water supply passage                        |
|    | 31a | first water supply passage                  |
|    | 31b | second water supply passage                 |
| 20 | 33  | water pouring port                          |
|    | 40  | detergent put-in portion frame body         |
|    | 40a | space portion                               |
|    | 41  | detergent liquid supply passage             |

## CLAIMS

1. A washing machine comprising:
  - a water tub; and
  - 5 a detergent put-in device that puts a liquid or a mixture in a liquid form into the water tub,
  - wherein
  - the detergent put-in device includes:
    - a liquid storing portion capable of storing the liquid or the
    - 10 mixture in a liquid form;
    - a storing portion lid plate that partially or wholly covers an upper portion of the liquid storing portion;
    - a first introducing passage that is formed in a cylindrical shape in the liquid storing portion and has a lower end portion opening near a
    - 15 bottom portion of the liquid storing portion;
    - an introducing passage joint portion that is connected to an upper end portion of the first introducing passage and is formed in an inverse U shape; and
    - a second introducing passage that is formed in a cylindrical
    - 20 shape, has one end connected to the introducing passage joint portion, and has the other end opening toward an outside of the bottom portion of the liquid storing portion, and
    - a liquid put-in passage is formed by the first introducing passage, the introducing passage joint portion, and the second introducing passage that are
    - 25 communicated with each other as one passage, and the liquid put-in passage is partially formed by the storing portion lid plate, and the storing portion lid plate is capable of being taken out from the liquid storing portion.

2. The washing machine according to claim 1, wherein  
the liquid storing portion includes one part of first introducing passage,  
one part of introducing passage joint portion, and the second introducing  
passage that are formed integrally with each other, and  
5 the storing portion lid plate includes the other part of first introducing  
passage and the other part of introducing passage joint portion that are formed  
integrally with each other.