fixed substances may enter from the suction port of the cylinder into a detergent supply water channel, resulting in a pressure loss in a water channel. In addition, when fixed substances adhere to the packing member between the liquid tank and the automatic liquid agent injection device, the water tightness of the coupling portions may deteriorate. For these reasons, the automatic liquid agent injection device cannot stably discharge a necessary amount of detergent liquid or softener liquid. As a result, washing performance or rinsing performance may deteriorate.

Citation List

Patent Literature

PTL 1: PCT International Publication No. 2016-524995

SUMMARY OF THE INVENTION

The present invention provides a washing machine that can wash away residues such as a liquid agent adhering to coupling portions between a tank and an automatic liquid agent injection device every time tap water is supplied to a tank storage portion.

The washing machine according to the present invention includes a housing, a water tub supported inside the housing, a tank storage portion disposed above the water tub and having a storage portion, and a tank detachably mounted in the storage portion and internally storing a liquid agent. The washing machine further includes a liquid supply device (automatic liquid agent injection device) configured to supply a liquid agent inside the tank into the water tub, a water supply channel provided in an upper portion of the housing and configured to supply water, a water channel communicating with the water supply channel, the water channel being a channel through which water is supplied into the storage portion of the tank

storage portion and a water supply valve provided in the housing and configured to open and close the water channel. The tank has a first cylindrical portion configured to discharge the

liquid agent to the water tub. The liquid supply device has a second cylindrical portion that is connected to the first cylindrical portion while the tank is mounted in the storage portion. The tank storage portion is configured to have a discharge port formed in a bottom portion and configured to discharge water inside the storage portion and an inclined surface formed on a side wall, the discharge port being a port through which water is discharged from the storage portion, the inclined surface being inclined downward toward the first cylindrical portion and the second cylindrical portion.

According to this configuration, tap water flowing through the water channel when water supply is performed in a washing or rinsing step flows along the inclined surface of the tank storage portion. At this time, the flowing tap water cleans the first cylindrical portion and the second cylindrical portion as coupling portions between the tank and the liquid supply device. This makes it unnecessary to periodically maintain portions around the coupling portions between the tank and the liquid supply device. In addition, this can prevent fixed substances of detergent liquid and the like from intruding a detergent supply water channel of the liquid supply device. Furthermore, this can maintain water tightness of the coupling portions between the tank and the liquid supply device. Accordingly, it is possible to stably discharge a desired amount of detergent liquid or softener liquid.

BRIEF DESCRIPTION OF DRAWINGS

FIG. 1 is an external perspective view of a washing machine according to an exemplary embodiment of the present invention.

FIG. 2 is a longitudinal sectional view of the washing machine according to the same exemplary embodiment.

FIG. 3 is an exploded perspective view of a main part of the washing machine according to the same exemplary embodiment.

injection device 109. This can also suppress a pressure loss of a liquid agent passing through the detergent supply water channel of automatic liquid agent injection device 109. In addition, this can maintain water tightness of the coupling portions between detergent tank 117 and automatic liquid agent injection device 109 for a long period of time.

This exemplary embodiment has exemplified the configuration using the drum washing machine. However, this is not exhaustive. For example, a top-loading washing machine may be used. This configuration can also have the same functions and effects as those described above.

As described above, a washing machine according to the present invention includes a housing, a water tub supported in the housing, a tank storage portion disposed above the water tub and having a storage portion, a tank detachably mounted in the storage portion and internally storing a liquid agent, and a liquid supply device configured to supply the liquid agent inside the tank into the water tub. The washing machine further includes a water supply channel provided in an upper portion of the housing and configured to supply water, a water channel communicating with the water supply channel and configured to inject water to the storage portion of the tank storage portion, and a water supply valve provided in the housing and configured to open and close the water channel. The tank has a first cylindrical portion configured to discharge the liquid agent to the water tub. The liquid supply device has a second cylindrical portion connected to the first cylindrical portion while the tank is mounted in the storage portion. The tank storage portion is configured to have a discharge port in a bottom portion and an inclined surface on a side wall, the discharge port being a port thorough which water is discharged from the storage portion, the inclined surface inclined downward toward the first

cylindrical portion and the second cylindrical portion.

According to this configuration, at the time of water supply in a

includes a bathwater pump configured to suck bathwater, an auxiliary water channel causing the water supply channel to communicate with the bathwater pump, and a discharge water channel causing the bathwater pump to communicate with the first water injection port. There may be provided a configuration to cause bathwater to flow into the storage portion through the first water injection port by operating the bathwater pump at the time of water supply in a washing step or rinsing step.

According to this configuration, the bathwater sucked by the bathwater pump flows along the inclined surface to clean the first cylindrical portion and the second cylindrical portion. This makes it unnecessary for the user to maintain portions around the coupling portions between the tank and the liquid supply device. This can also prevent fixed substances of a liquid agent and the like from intruding the detergent supply water channel of the liquid supply device. In addition, because water tightness of the coupling portions between the tank and the liquid supply device can be maintained, it is possible to stably discharge a desired amount of liquid agent such as detergent liquid or softener liquid.

The washing machine according to the present invention may be configured such that the bathwater pump is disposed at a position facing the first water injection port.

This configuration can shorten a length of the discharge water channel from the bathwater pump. This makes it possible to efficiently supply the bathwater sucked by the bathwater pump into the tank storage case.

The washing machine according to the present invention includes a water injection case provided in an upper portion of the tank storage portion, a water injection channel provided in the water injection case and communicating with the water supply channel, and a second water

injection port provided in the

CLAIMS

1. A washing machine comprising:

a housing;

a water tub supported inside the housing;

a tank storage portion disposed above the water tub and having a storage portion;

a tank detachably mounted in the storage portion and internally storing a liquid agent;

a liquid supply device configured to supply the liquid agent inside the tank into the water tub;

a water supply channel provided in an upper portion of the housing and configured to supply water;

a water channel communicating with the water supply channel, the water channel being a channel through which water is supplied into the storage portion of the tank storage portion; and

a water supply valve provided in the housing and configured to open and close the water channel,

wherein the tank has a first cylindrical portion configured to discharge the liquid agent to the water tub,

the liquid supply device includes a second cylindrical portion that is connected to the first cylindrical portion while the tank is mounted in the storage portion, and

the tank storage portion has a discharge port in a bottom portion and an inclined surface on a side wall, the discharge port being a port through which water is discharged from the storage portion, the inclined surface being inclined downward toward the first cylindrical portion and the second

cylindrical portion.

2. The washing machine according to claim 1, wherein the tank storage portion has a first water injection port provided in a wall surface, communicating with the water channel above the inclined surface, and configured to supply the water from the first water injection port toward the inclined surface.

3. The washing machine according to claim 2, further comprising:

a bathwater pump configured to suck bathwater;

an auxiliary water channel causing the water supply channel to communicate with the bathwater pump; and

a discharge water channel causing the bathwater pump to communicate with the first water injection port,

wherein the bathwater is caused to flow into the storage portion through the first water injection port by operating the bathwater pump when water supply is performed in a washing step or rinsing step.

4. The washing machine according to claim 3, wherein the bathwater pump is disposed at a position facing the first water injection port.

5. The washing machine according to claim 1, further comprising:

a water injection case provided in an upper portion of the tank storage portion;

a water injection channel provided in the water injection case and communicating with the water supply channel; and

a second water injection port provided in the water injection case and

communicating the water injection channel,

wherein the water flowing through the water injection channel is injected from the second water injection port to the inclined surface of the tank storage portion.

5