SUMMARY

[0011]

The above conventional washing machine executes the disturbance step in order to remove detergent residue 115 adsorbed and remaining on wall surfaces of the outer surface of washing and spin-drying tub 103 and the inner surface of water receiving tub 101. Therefore, in a case where laundry 113 in washing and spin-drying tub 103 has poor balance, washing and spin-drying tub 103 is intensely shaken when control device 116 rotates washing and spin-drying tub 103. As a result, there is a possibility that the washing liquid applied with centrifugal force splashes out of the washing machine to cause water leakage or increase vibration and noise of the washing machine.

[0012]

The present disclosure prevents splashing of the washing liquid out of the washing machine in the disturbance step, and vibration and noise of the washing machine. Furthermore, a detergent residue adsorbed and remaining on wall surfaces of the outer surface of the washing and spin-drying tub and the inner surface of the water receiving tub is stably removed by the force of the disturbed water flow.

[0013]

In a first aspect, the present disclosure provides a washing machine comprising a washing and spin-drying tub, a water receiving tub including the washing and spin-drying tub, a driver that drives the washing and spin-drying tub to rotate, a water level detector that includes a pressure sensor, detects the water level of the washing and spin-drying tub by pressure and outputs the water level, and a controller that causes the washing machine to execute a washing step, a rinsing step, and a spin-drying step. The controller cause the

washing machine to execute a disturbance step of applying centrifugal force to the

washing liquid in the water receiving tub by causing the driver to rotate the washing and spin-drying tub in the rinsing step so as to disturb the washing liquid between the washing and spin-drying tub and the water receiving tub. In a case where the fluctuation of the water level of washing and spin-drying tub, which is the fluctuation of the output value of water level detector, exceeds a threshold, the controller determines that an imbalance of laundry inside the washing and spin-drying tube has occurred, and decides execution of a changing step of reducing the rotation speed of the washing and spin-drying tub in the disturbance step.

In a second aspect, the present disclosure provides a washing machine comprising: a washing and spin-drying tub; a water receiving tub including the washing and spin-drying tub; a driver that drives the washing and spin-drying tub to rotate; a water level detector that includes a pressure sensor, detects a water level of the washing and spin-drying tub by pressure and outputs the water level; and a controller that causes the washing machine to execute a washing step, a rinsing step, and a spin-drying step, wherein the controller causes the washing machine to execute a disturbance step of applying centrifugal force to washing liquid in the water receiving tub by causing the driver to rotate the washing and spin-drying tub in the rinsing step so as to disturb washing liquid between the washing and spin-drying tub and the water receiving tub, andin a case where the fluctuation of the water level of washing and spin-drying tub, which is the fluctuation of the output value of water level detector, exceeds a threshold, the controller determines that an imbalance of laundry inside the washing and spin-drying tub has occurred, and decides execution of a correction rinsing step of correcting an imbalance state of laundry in the washing and spin-drying tub according to output from the water level

detector in the disturbance step.

[0014]

A washing machine according to the present disclosure prevents splashing of the washing liquid out of the washing machine in the disturbance step, and vibration and noise of the washing machine. Furthermore, a detergent residue adsorbed and remaining on wall surfaces of the outer surface of the washing and spin-drying tub and the inner surface of the water receiving tub can be stably removed by the force of the disturbed water flow.

BRIEF DESCRIPTION OF DRAWINGS

[0015]

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

FIG. 2 is a block circuit diagram of the washing machine according to the first exemplary embodiment of the present disclosure.

FIG. 3 is a sequence diagram illustrating a basic operation procedure of the washing machine according to the first exemplary embodiment of the present disclosure.

FIG. 4 is a diagram illustrating the relationship between output from a water level detector and the water level of the washing machine according to the first exemplary embodiment of the present disclosure.

FIG. 5 is a diagram illustrating the relationship between time and the

CLAIMS

1. A washing machine comprising:

a washing and spin-drying tub;

a water receiving tub including the washing and spin-drying tub;

a driver that drives the washing and spin-drying tub to rotate;

a water level detector that includes a pressure sensor, detects a water level of the washing and spin-drying tub by pressure and outputs the water level; and

a controller that causes the washing machine to execute a washing step, a rinsing step, and a spin-drying step,

wherein the controller cause the washing machine to execute a disturbance step of applying centrifugal force to washing liquid in the water receiving tub by causing the driver to rotate the washing and spin-drying tub in the rinsing step so as to disturb washing liquid between the washing and spin-drying tub and the water receiving tub, and

in a case where the fluctuation of the water level of washing and spin-drying tub, which is the fluctuation of the output value of water level detector, exceeds a threshold, the controller determines that an imbalance of laundry inside the washing and spin-drying tube has occurred, and decides execution of a changing step of reducing a rotation speed of the washing and spin-drying tub in the disturbance step.

2. A washing machine comprising:

a washing and spin-drying tub;

a water receiving tub including the washing and spin-drying tub;

a driver that drives the washing and spin-drying tub to rotate;

a water level detector that includes a pressure sensor, detects a water level of the washing and spin-drying tub by pressure and outputs the water level; and

a controller that causes the washing machine to execute a washing step, a rinsing step, and a spin-drying step,

wherein the controller causes the washing machine to execute a disturbance step of applying centrifugal force to washing liquid in the water receiving tub by causing the driver to rotate the washing and spin-drying tub in the rinsing step so as to disturb washing liquid between the washing and spin-drying tub and the water receiving tub, and

in a case where the fluctuation of the water level of washing and spin-drying tub, which is the fluctuation of the output value of water level detector, exceeds a threshold, the controller determines that an imbalance of laundry inside the washing and spin-drying tub has occurred, and decides execution of a correction rinsing step of correcting state of the imbalance in the disturbance step.

3. The washing machine according to claim 1 or 2, wherein the controller causes the washing machine to execute drainage of the washing liquid while increasing the rotation speed of the washing and spin-drying tub in the disturbance step.

4. The washing machine according to claim 1, further comprising a cloth amount detector that detects an amount of laundry in the washing and spin-drying tub,

wherein the controller

decreases the the rotation speed of washing and spin-drying tub in the

changing step when determining that the amount of laundry is large on the basis of output from cloth amount detector, and

increases the rotation speed of washing and spin-drying tub in the changing step when determining that the amount of laundry is small on the basis of the output from cloth amount detector.

5. The washing machine according to claim 1, further comprising a cloth amount detector that detects an amount of laundry in the washing and spin-drying tub,

wherein the controller, when determining that the amount of laundry is large on the basis of output from cloth amount detector, changes the water level of the washing and spin-drying tub at a start of the disturbance step in the way that the water level is set to be decreased as the amount of laundry increases.