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(54) **WASHING MACHINE COMPRISING A SYSTEM FOR SPRAYING WATER**

WASCHMASCHINE MIT EINEM SYSTEM ZUM SPRÜHEN VON WASSER

MACHINE A LAVER COMPRENANT UN SYSTÈME D'ASPERSION D'EAU

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Description

TECHNICAL FIELD

[0001] The present invention relates to the technical field of washing machines, and particularly relates to a washing machine having a spray system and comprising the features of the preamble portion of claim 1 .

BACKGROUND

[0002] After clothes are washed by the original drum washing machine, a small amount of foams always exists on a window gasket and glass, when a user takes the clothes, the clothes may be contaminated by the foams, and the clothes even need to be rinsed again when the amount of the foams is large. Along with increasing of demands of users, double-spray design is used on most of high-end washing machines, when programs are about to be finished, the foams on the window gasket and the glass of a washing machine can be cleaned thoroughly. However, in the existing structural design, a spray head is connected with a water inlet valve by a quite long hose generally, and the spray head directly sprays. No pressurization or pressure division design is used in the structure, and when water pressure is too small, insufficient spray water amount or uneven spray and the like on two spray nozzles may be caused. After spray is finished, because the pressure in the drum of the washing machine is greater than the pressure of the outside, part of water in a spray pipe cannot be sprayed out completely, and at the moment when the user opens the door, water in the spray pipe may drip out of the machine.

[0003] CN 104775281 B discloses a water supply unit of a washing machine, which comprises a water supply unit cover plate. The water supply unit cover plate comprises a water cavity which allows cold water to circulate, a water inlet is formed in one side of the water cavity, and a water outlet is formed in the bottom of the water cavity. The water supply unit cover plate is further provided with an air hole which feed hot steam discharged from an outer drum into the water supply unit cover plate so as to condense and liquefy the hot steam. A washing machine with the water supply unit is also disclosed.

[0004] Although the water supply unit of the washing machine is provided in the patent and a condensing pipe is mounted on the water supply unit. However, the following problems existed: (1) after water supply of the water supply unit is finished, the pressure in the drum of the washing machine is greater than the pressure of the outside, part of water in the water supply unit cannot be sprayed out completely, and therefore, water in a water pipe of the water supply unit may drip out of the machine at the moment when the user opens the door; (2) no pressurization or pressure division design is used in a spray pipeline, and when water pressure is over small, insufficient spray water amount or uneven spray and the

like on two spray nozzles may be caused; (3) due to space structure limitation on the related design of the condensing pipe, the condensing effect is not obvious; and (4) hot steam which is not condensed may enter the outer drum of the washing machine from the air holes to erode components of the washing machine.

[0005] CN 102102285 B discloses a pulsator washing machine with a function of cleaning tubs by spraying. The pulsator washing machine comprises a shell, an outer drum positioned in the shell for storing washing water, an inner drum mounted in the outer drum for placing clothes required to be washed, and a spray device capable of cleaning the wall of the inner drum and the wall of the outer drum simultaneously is mounted between the inner drum and the outer drum, the spray device communicates with a water inlet of the washing machine. The spray device comprises an annular spray thrower and a water inlet hose, the annular spray thrower is fixedly inserted between the inner drum and the outer drum, one end of the water inlet hose communicates with the annular spray thrower, the other end of the water inlet hose communicates with the water inlet of the washing machine, and spray water outlets which spray water inwards and outwards are formed in the annular spray thrower along the periphery of the annular spray thrower. The annular spray thrower is provided with at least two spray water inlets, perforated holes are formed in the outer drum and correspond to the spray water inlets, and the spray water inlets penetrate through the perforated holes and communicate with the water inlet of the washing machine through the water inlet hose.

[0006] Although the pulsator washing machine in the patent has a certain drum cleaning function, the following problems will be caused: (1) the structure of a spray pipeline of the washing machine is complicated; (2) when water pressure in the spray pipeline during working is too small, insufficient spray water amount or uneven spray and the like on two spray nozzles may be caused; and (3) there is no pressure adjusting device arranged between the spray pipeline and the outer drum, thus the pressure of the inner drum is large, part of water remains in the pipeline after spray is finished, and water dripping and the like when the door is opened can be caused.

[0007] A washing machine comprising the features of the preamble portion of claim 1 is known from EP 1 600 546 A1. Another washing machine is known from EP 0 597 274 A1.

SUMMARY

[0008] The present invention aims at solving the problem that water drips from a spray system of a washing machine when a door of the washing machine is opened after spraying has been finished.

[0009] This technical problem is solved by the subject matter of claim 1. Advantageous embodiments are indicated in further claims.

[0010] The present invention provides a spray system

of a washing machine which enables a spray pipeline to communicate with an outer drum of the washing machine after spray is finished for enabling residual water in the spray pipeline to flow into the drum to avoid water dripping when the door is opened.

[0011] The spray system of the washing machine comprises a spray pipeline with one end being a water inlet, and an air pressure communication device, one side of the air pressure communication device communicates with the spray pipeline, and the other side of the air pressure communication device communicates with an outer drum of the washing machine. The air pressure communication device has a 'switch-on' state and a 'switch-off' state, after spray is finished, the air pressure communication device is switched on, then the spray pipeline communicates with the outer drum of the washing machine by the air pressure communication device, the air pressure of the outer drum of the washing machine is equal to the air pressure of the spray pipeline, residual water in the spray pipeline drops into the drum of the washing machine through the spray pipeline, and the circumstances that the residual water in the spray pipeline remains in the pipeline due to large pressure in the drum of the washing machine, and the residual water drips out of the machine at the moment when a user opens the door of the washing machine can be avoided effectively.

[0012] Further, according to the invention, the air pressure communication device is a one-way valve, the outlet of the one-way valve communicates with the spray pipeline, the inlet of the one-way valve communicates with the outer drum of the washing machine, and by the one-way switch-on effect of the one-way valve, the spray pipeline can be allowed to communicate with or be closed off from the outer drum of the washing machine.

[0013] In one embodiment, the air pressure communication device is arranged on the spray pipeline and positioned at the downstream of the water inlet, at least one side of the air pressure communication device is arranged in the spray pipeline, and the other side of the air pressure communication device communicates with the outer drum of the washing machine. One side of the air pressure communication device is arranged in the spray pipeline, the corresponding connecting pipe is not required, and thus, advantages of convenience in mounting and easiness in operation are achieved. Moreover, the air pressure communication device can communicate with the outer drum of the washing machine, thus, the pressures of the outer drum of the washing machine and the spray pipeline are adjusted to solve the problems of water dripping and the like when the door of the washing machine is opened.

[0014] Both two sides of the air pressure communication device can be arranged on the spray pipeline, a connecting pipe is required for communication between the spray pipeline and the outer drum of the washing machine through a water storage tank cover, and therefore, the pressure in the drum of the washing machine is guaranteed to be equal to the pressure of the spray pipeline

through the air pressure communication device after spray is finished.

[0015] In a further embodiment, the air pressure communication device has a 'switch-on' state and a 'switch-off' state, when the air pressure communication device is in the 'switch-on' state, the outer drum of the washing machine communicates with the spray pipeline through the air pressure communication device, at the moment, a water inlet valve of the spray pipeline is closed, the residual water in the spray pipeline can flow into the drum of the washing machine through the spray pipeline, and the problem of water dripping when the door is opened is solved. When the air pressure communication device is in the 'switch-off' state, the outer drum of the washing machine cannot communicate with the spray pipeline through the air pressure communication device, and at the moment, the water in the spray pipeline flows to the positions of sprayers through the pipeline, and is sprinkled to the inside of the drum of the washing machine.

[0016] In a further embodiment, the air pressure communication device is arranged on the spray pipeline and is close to the water inlet, and by the design, the residual water in the spray pipeline can flow out fully.

[0017] In a further embodiment, at least part of the outlet of the one-way valve is arranged in the spray pipeline, and the inlet of the one-way valve communicates with the outer drum of the washing machine. When the one-way valve is totally arranged in the spray pipeline, the inlet of the one-way valve communicates with the outer drum of the washing machine through a connecting pipe, and the joint of the connecting pipe and the spray pipeline is arranged in a sealed manner; and when the outlet of the one-way valve is partially arranged in the spray pipeline, the joint of the one-way valve and the spray pipeline is sealed, the inlet of the one-way valve communicates with the outer drum of the washing machine. By the mounting, the advantages of convenience in mounting and easiness in operation are achieved, moreover, the air pressure communication device can communicate with the outer drum of the washing machine, therefore, the pressures of the outer drum of the washing machine and the spray pipeline are adjusted, and the problems of water dripping and the like when the door of the washing machine is opened are solved.

[0018] In a further embodiment, the one-way valve comprises a valve body and a valve element, the valve element is perpendicular to the center line of the spray pipeline and moves in the vertical direction. The one-way valve has a 'switch-on' state and a 'switch-off' state, by movement of the valve element, the outer drum of the washing machine is allowed to communicate with or be closed off from the spray pipeline through the one-way valve, and air in the drum is enabled to communicate with or is prevented from communicating with the spray pipeline through the one-way valve. The one-way valve is convenient to use and easy to mount, and by the one-way switch-on effect of the one-way valve, the spray pipeline can be allowed to communicate with or be closed off

from the outer drum of the washing machine.

[0019] In a further embodiment, the air pressure communication device comprises a pressurizing rib, the pressurizing rib is arranged in the spray pipeline and cooperates with the one-way valve for use, and the pressurizing rib is arranged at the downstream of water flow of the one-way valve, is perpendicular to the direction of the water flow, and is close to the one-way valve. The pressurizing rib is connected with the spray pipeline in a mode of welding, adhesion or fusion covering. By the pressurizing rib mounted beside the one-way valve, the water flow can generate pressure in a spray process, the one-way valve is in the switch-off state under the effect of the pressure of the water flow, and the water flow can smoothly flow to the positions of the sprayers from the spray pipeline in a spray process.

[0020] In a further embodiment, a baffle type pressurizing rib which uniformly divides the spray pipeline into double spray channels is arranged at the other end of the spray pipeline, the other end of the spray pipeline is provided with double sprayers. By the design of the double sprayers, the cleaning effect is better, and higher demands of users are met. By the baffle type pressurizing rib which is mounted above the double sprayers and uniformly divides the spray pipeline into the double spray channels, insufficient spray water amount or uneven spray on the two sprayers when the water pressure is over small can be avoided, the spray water is uniformly sprayed to an inner drum of the washing machine, and the better effect in the spray process is ensured.

[0021] In a further embodiment, the spray pipeline is arranged on the water storage tank cover in an integrally formed manner, the air pressure communication device communicates with a water storage tank of the washing machine through the water storage tank cover, the water storage tank communicates with the outer drum of the washing machine. Preferably, a flow channel is formed in the upper part of the outside of the water storage tank cover, the flow channel and the water storage tank cover are formed integrally, a flow channel top cover is arranged on the flow channel and is fastened to the flow channel, a cavity formed between the flow channel top cover and the flow channel is the spray pipeline. Therefore, the air pressure communication device communicates with the outer drum of the washing machine, the pressure of the outer drum of the washing machine and the pressure of the spray pipeline are the same, the water in the spray pipeline can totally flow into the outer drum of the washing machine, residual water does not exist, water dripping when the door is opened due to the residual water in the spray pipeline is avoided. Preferably, the flow channel is formed in the upper part of the outside of the water storage tank cover, the flow channel and the water storage tank cover are integrally formed, the flow channel top cover is arranged on the flow channel and is fastened to the flow channel, and the cavity formed between the flow channel top cover and the flow channel is the spray pipeline.

[0022] In a further embodiment, a washing machine with the spray system as described above is provided.

[0023] After the technical scheme is employed, the disclosure has the following beneficial effects:

1. After spray is finished, the spray pipeline can communicate with the outer drum of the washing machine by the air pressure communication device, the air pressure of the outer drum of the washing machine is equal to the air pressure of the spray pipeline, the residual water in the spray pipeline can drop into the drum of the washing machine through the spray pipeline. Thus, the circumstance that the residual water in the spray pipeline remains in the pipeline due to large pressure in the drum of the washing machine, and the water drips out of the machine at the moment when a user opens the door of the washing machine can be avoided effectively.
2. The one-way valve is used as the air pressure communication device, and is simple in structure and convenient to mount, moreover, when spray is finished, high-pressure air in the drum of the washing machine can enable the valve element of the one-way valve to be closed, and the high-pressure air applies pressure for communication between the outer drum of the washing machine and the spray pipeline.
3. The air pressure communication device is mounted on the spray pipeline and is close to the water inlet, so that the residual water in the spray pipeline can be drained as much as possible, and water dripping when the door is opened is relieved.
4. By the design of the double sprayers, the cleaning effect is better, and the higher demands of users are met. Moreover, by the baffle type pressurizing rib mounted above the double sprayers, insufficient spray water amount or uneven spray on the two sprayers when the water pressure is over small can be avoided, spray water can be uniformly sprayed into the drum of the washing machine, and the better effect in the spray process is ensured.

[0024] The detailed description of the disclosure will be further described in detail below with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0025]

- Fig. 1 is a structure schematic of a water storage tank cover with an air communication device arranged in a spray pipeline of the disclosure;
 Fig. 2 is a structure schematic of a water storage tank cover with a one-way valve is arranged in a spray pipeline of the disclosure;
 Fig. 3 is an exploded view of various structures above a water storage tank of the disclosure;

Fig. 4 is a sectional view taken along the direction C-C of Fig. 2; and

Fig. 5 is a sectional view taken along the direction A-A of Fig. 2, wherein

1-water inlet, 2-air pressure communication device, 3-pressurizing rib, 4-condenser, 5-double sprayers, 6-baffle type pressurizing rib, 7-spray pipeline, 8-one-way valve, 9-hot steam inlet, 10-condensed water inlet, 11-water storage tank, 12-water storage tank cover, 13-valve body, and 14-valve element.

DETAILED DESCRIPTION

[0026] The detailed embodiments of the disclosure will be further described below with reference to the accompanying drawings.

[0027] As shown in Fig. 1, a spray system of a washing machine comprises a spray pipeline 7, one end of the spray pipeline 7 is a water inlet 1, and further comprises an air pressure communication device 2. One side of the air pressure communication device 2 communicates with the spray pipeline 7, the other side of the air pressure communication device 2 communicates with a water storage tank 11 through the water storage tank cover 12. The water storage tank 11 communicates with an outer drum of the washing machine, therefore the spray pipeline 7 communicates with the outer drum of the washing machine. The air pressure communication device 2 has a 'switch-on' state and a 'switch-off' state. After spray is finished, the air pressure communication device 2 is switched on, then the spray pipeline 7 communicates with the outer drum of the washing machine, the air pressure of the outer drum of the washing machine is equal to the air pressure of the spray pipeline 7, residual water in the spray pipeline 7 drops into the drum of the washing machine through the spray pipeline 7, and the circumstances that the residual water in the spray pipeline 7 remains in the pipeline due to large pressure in the drum of the washing machine, and the water drips out of the machine at the moment when a user opens the door of the washing machine can be avoided effectively.

[0028] As shown in Fig. 1, Fig. 2 and Fig. 3, the spray system is integrally arranged on the water storage tank cover 12 of the water storage tank 11, the air pressure communication device 2 communicates with the water storage tank of the washing machine through the water storage tank cover 12, the water storage tank of the washing machine communicates with the outer drum of the washing machine. Preferably, a flow channel is formed in the upper part of the outside of the water storage tank cover 12. The flow channel and the water storage tank cover 12 are integrally formed, a flow channel top cover is arranged on the flow channel and is fastened to the flow channel, and a cavity formed between the flow channel top cover and the flow channel is the spray pipeline. A condenser 4 is further mounted on the water storage tank cover 12 of the water storage tank 11, a condensing

pipe of the condenser 4 is in a 'multi-turning'-shaped fold-back mode, and hot steam enters a 'multi-turning'-shaped channel from a hot steam inlet 9, passes through the condensing pipe, and flows back to the inside of the machine from a condensed water inlet 10. By the 'multi-turning'-shaped design of the condenser, the length of the condenser is increased, the time of steam staying in the pipe is prolonged, the condensing effect is better, erosion to components of the washing machine due to overflowing of the hot steam can be avoided. Both the spray system and the condenser 4 are arranged above the water storage tank, water holes which can be connected with a water inlet valve through hoses are formed in the rear of the water storage tank cover, the insides of the water holes correspond to different water channels. By opening and closing of a control valve, water feeding for main washing, pre-washing, spray, softening and the like can be realized easily, moreover, unnecessary space occupation can be reduced, and the cost is saved.

Embodiment 1

[0029] As shown in Fig. 1, the air pressure communication device 2 is arranged on a spray pipeline 7 and positioned at the downstream of a water inlet 1, one side of the air pressure communication device 2 is arranged in the spray pipeline 7, the other side of the air pressure communication device 2 communicates with a water storage tank 11 through the water storage tank cover 12. The water storage tank 11 communicates with an outer drum of the washing machine, and further the spray pipeline 7 communicates with the outer drum of the washing machine. One side of the air pressure communication device 2 is arranged in the spray pipeline 7 and the corresponding connecting pipe is not required, and advantages of convenience in mounting and easiness in operation are achieved. The air pressure communication device 2 can communicate with the outer drum of the washing machine, thus, the pressures of the outer drum of the washing machine and the spray pipeline 7 are adjusted, problems of water dripping when the door of the washing machine is opened and the like are solved.

[0030] Both two sides of the air pressure communication device 2 can be arranged on the spray pipeline 7, and a connecting pipe is required for communication between the spray pipeline 7 and the water storage tank 11 of the washing machine through the water storage tank cover 12. The water storage tank 11 of the washing machine communicates with the outer drum of the washing machine, and therefore, the pressure in the drum of the washing machine is guaranteed to be equal to the pressure in the spray pipeline 7.

[0031] The air pressure communication device 2 has a 'switch-on' state and a 'switch-off' state. The air pressure communication device 2 is switched off during spray, and water flow normally flows to the positions of the sprayers through the spray pipeline 7; and after spray is finished, the air pressure communication device 2 is

switched on to communicate with the water storage tank 11 through the water storage tank cover 12. Thus, the water storage tank 11 communicates with the outer drum of the washing machine, then the spray pipeline 7 communicates with the outer drum of the washing machine, the air pressure of the outer drum of the washing machine is equal to the air pressure of the spray pipeline 7, residual water in the spray pipeline 7 drops into the drum of the washing machine through the spray pipeline 7.

[0032] The air pressure communication device 2 is connected with the spray pipeline 7 in one mode selected from welding, adhesion or fusion covering, and the joint of the air pressure communication device 2 and the spray pipeline 7 is sealed. By the seal design of the joint, the water in the spray pipeline 7 is prevented from leaking out of the pipeline from the joint of the air pressure communication device 2 and the spray pipeline 7.

Embodiment 2

[0033] As shown in Fig. 1, an air pressure communication device 2 is mounted at the downstream of a water inlet 1 of a spray pipeline 7, preferably, the air pressure communication device 2 is arranged on the spray pipeline 7 and is close to the water inlet 1. Thus, after spray is finished, the air pressure communication device 2 is in a switch-on state, and communicates with a water storage tank 11 through the water storage tank cover 12, the water storage tank 11 communicates with the outer drum of the washing machine to enable the air pressure of the outer drum of the washing machine to be equal to the air pressure of the spray pipeline 7, water in the spray pipeline 7 can flow out totally, and the problems of water dripping when a door is opened and the like are reduced.

Embodiment 3

[0034] As shown in Fig. 2, Fig. 4 and Fig. 5, an air pressure communication device 2 comprises a one-way valve 8 and a pressurizing rib 3 cooperating with the one-way valve 8. At least part of the outlet of the one-way valve 8 is mounted in an opening of a spray pipeline 7 and positioned at the downstream of the water inlet 1, the inlet of the one-way valve 8 communicates with a water storage tank 11 of the washing machine through a water storage tank cover 12 of the washing machine. The water storage tank 11 of the washing machine communicates with an outer drum of the washing machine, and the one-way valve 8 and a spray device are of a sealed structure. The pressurizing rib 3 is cooperated with the one-way valve 8 for use, is mounted at the downstream of the one-way valve 8, and is close to the one-way valve 8, and the pressurizing rib 3 is connected with the spray pipeline 7 in a mode of welding, adhesion or fusion covering.

[0035] The one-way valve 8 comprises a valve body 13 and a valve element 14, the valve element 14 is perpendicular to the center line of the spray pipeline 7 and

moves in the vertical direction. The one-way valve 8 has a 'switch-on' state and a 'switch-off' state, when water flowing through the one-way valve 8, water flows into the spray pipeline 7, water pressure at the position of the pressurizing rib 3 is increased, the one-way valve 8 is in the switch-off state, at the moment, air in the drum of the washing machine cannot enter the spray pipeline 7, and water enters the drum of the washing machine through the spray pipeline 7.

[0036] After the water flow passes through the one-way valve 8, the one-way valve 8 is in the switch-on state, at the moment, the one-way valve 8 communicates with the outer drum of the washing machine through the spray pipeline 7, the pressure in the drum of the washing machine is the same as the pressure of the spray pipeline 7. Thus, residual water in the spray pipeline 7 totally flows into the drum of the washing machine, and by movement of the valve element 14, the outer drum of the washing machine is allowed to communicate with or be closed off from the spray pipeline 7 through the one-way valve 8.

[0037] By cooperation of the one-way valve 8 and the pressurizing rib 3, the structure is simple, mounting is facilitated, moreover, the circumstances that the residual water in the spray pipeline 7 remains in the pipeline due to large pressure in the drum of the washing machine, and the water drips out of the machine at the moment when a user opens the door of the washing machine can be avoided effectively.

[0038] The total one-way valve 8 of the embodiment can be totally arranged in the spray pipeline 7, at the moment, the inlet of the one-way valve 8 communicates with the outer drum of the washing machine through the corresponding connecting pipe, and the joint of the corresponding connecting pipe and the spray pipeline 7 is sealed.

Embodiment 4

[0039] In the present disclosure, an air pressure communication device 2 comprises a one-way valve 8, a pressurizing rib 3 cooperating with the one-way valve 8, and a connecting pipe is further comprised. One end of the connecting pipe is connected with a spray pipeline 7, the other end of the connecting pipe communicates with a water storage tank 11 of the washing machine through the water storage tank cover 12. The water storage tank 11 of the washing machine communicates with an outer drum of the washing machine, the one-way valve 8 is mounted in the connecting pipe, the pressurizing rib 3 cooperates with the one-way valve 8 for use, the pressurizing rib 3 is mounted at the downstream of the one-way valve 8 and is close to the one-way valve 8, and one end of the connecting pipe is connected with the spray pipeline 7 in a mode of welding, adhesion or fusion covering.

[0040] The one-way valve 8 has a 'switch-on' state and a 'switch-off' state, when passing through the one-way valve 8, water flow enters the spray pipeline, the water

pressure at the position of the pressurizing rib 3 is increased, the one-way valve 8 is in the switch-off state, at the moment, air in the drum of the washing machine cannot enter the spray pipeline 7, and water enters the drum of the washing machine through the spray pipeline 7.

[0041] By cooperation of the one-way valve 8 and the pressurizing rib 3, the structure is simple, mounting is facilitated, and moreover, the circumstances that the residual water in the spray pipeline 7 remains in the pipeline due to large pressure in the drum of the washing machine, and the water drips out of the machine at the moment when a user opens the door of the washing machine can be avoided effectively.

Embodiment 5

[0042] As shown in Fig. 1, Fig. 2 and Fig. 3, an end of a spray pipeline 7 is provided with double sprayers 5, and a baffle type pressurizing rib 6 is additionally arranged at the positions of the double sprayers 5. The baffle type pressurizing rib 6 is mounted above water flow of the double sprayers 5. By the baffle type pressurizing rib 6 mounted above the double sprayers 5, insufficient spray water amount or uneven spray on the two sprayers when the water pressure is over small can be avoided, spray water can be uniformly sprayed into the drum of the washing machine, the better effect in a spray process is ensured, by the design of the double sprayers 5, the better cleaning effect is achieved, and higher demands of users can be met.

Embodiment 6

[0043] As shown in Fig. 1, Fig. 2 and Fig. 3, a spray pipeline 7 is arranged on a water storage tank cover 12 of a water storage tank 11 in an integrally formed manner, the other side of an air pressure communication device 2 is connected with the water storage tank 11 of a washing machine through the water storage tank cover 12, and the water storage tank 11 communicates with an outer drum of the washing machine. The air pressure communication device 2 communicates with the outer drum of the washing machine through the water storage tank cover 12, therefore, the pressures of the outer drum of the washing machine and the spray pipeline 7 are adjusted, and the problems of water dripping when the door of the washing machine is opened and the like are solved.

Embodiment 7

[0044] A washing machine with the spray system (not shown in the drawing) is described in the embodiment. The spray pipeline is arranged on a water storage tank cover 12 of the washing machine in an integrally formed manner, the air pressure communication device 2 communicates with a water storage tank 11 of the washing machine through the water storage tank cover 12, and

the water storage tank 11 communicates with an outer drum of the washing machine. Preferably, a flow channel is formed in the upper part of the outside of the water storage tank cover 12, the flow channel and the water storage tank cover are integrally formed, a flow channel top cover is arranged on the flow channel and is fastened to the flow channel, and a cavity formed between the flow channel top cover and the flow channel is the spray pipeline. The outer drum of the washing machine communicates with the spray pipeline by the air pressure communication device, the pressure of the outer drum of the washing machine is guaranteed to be the same as the pressure of the spray pipeline, water in the spray pipeline can totally flow into the outer drum of the washing machine, and the problems of water dripping when the door is opened and the like due to residual water in the spray pipeline are avoided.

Claims

1. A washing machine, comprising an outer drum and a spray system, the spray system comprising:
 - a spray pipeline (7) with one end being a water inlet (1),
 - characterized by**
 - an air pressure communication device (2), wherein one side of the air pressure communication device (2) is communicated with the spray pipeline (7), and another side of the air pressure communication device (2) is communicated with the outer drum of the washing machine, wherein the air pressure communication device (2) is a one-way valve (8), an outlet of the one-way valve (8) is communicated with the spray pipeline (7), and an inlet of the one-way valve (8) is communicated with the outer drum of the washing machine, so that, by switching the one-way valve (8) on or off, the spray pipeline (7) can be allowed to communicate with or be closed off from the outer drum of the washing machine; and
 - at least part of the outlet of the one-way valve (8) is arranged in the spray pipeline (7).
2. The washing machine according to claim 1, wherein, the air pressure communication device (2) is arranged on the spray pipeline (7) which is positioned at a downstream of the water inlet (1) of the washing machine, at least one side of the air pressure communication device (2) is arranged in the spray pipeline (7), and another side of the air pressure communication device (2) communicates with the outer drum of the washing machine.
3. The washing machine according to claim 2, wherein, the air pressure communication device (2) is ar-

ranged on the spray pipeline (7) and is close to the water inlet (1).

4. The washing machine according to claim 1 to 3, wherein, the one-way valve (8) comprises a valve body (13) and a valve element (14), the valve element (14) is arranged perpendicular to a center line of the spray pipeline (7) and moves in a vertical direction, the one-way valve (8) has a 'switch-on' state and a 'switch-off' state, the outer drum of the washing machine is allowed to communicate with or be closed off from the spray pipeline (7) through the one-way valve (8) by a movement of the valve element (14).
5. The washing machine according to one of claims 1 to 4, wherein, the spray system further comprises a pressurizing rib (3); the pressurizing rib (3) is arranged in the spray pipeline is positioned at a downstream of water flow of the one-way valve (8), is perpendicular to a direction of the water flow, and is close to the one-way valve (8).
6. The washing machine according to any one of claims 1 to 5, wherein, the spray pipeline (7) is arranged on a water storage tank cover (12) of the washing machine in an integrally formed manner, the air pressure communication device (2) communicates with a water storage tank (11) of the washing machine through the water storage tank cover (12), the water storage tank (11) communicates with the outer drum of the washing machine.
7. The washing machine according to claim 6, wherein, a flow channel is formed in an upper part of an outside of the water storage tank cover (12), the flow channel and the water storage tank cover (12) are integrally formed, a flow channel top cover is arranged on the flow channel and is fastened to the flow channel, and a cavity formed by the flow channel top cover and the flow channel is the spray pipeline

Patentansprüche

1. Waschmaschine, umfassend eine äußere Trommel und ein Sprühsystem, wobei das Sprühsystem umfasst:

eine Sprührohrleitung (7), deren eines Ende ein Wassereinlass (1) ist,

gekennzeichnet durch

eine Luftdruckverbindungs-
vorrichtung (2), wobei eine Seite der Luftdruckverbindungs-
vorrichtung (2) mit der Sprührohrleitung (7) verbunden
ist und eine andere Seite der Luftdruckverbindungs-
vorrichtung (2) mit der Außentrommel der

Waschmaschine verbunden ist,
wobei die Luftdruckverbindungs-
vorrichtung (2) ein Einwegventil (8) ist, ein Auslass des Einweg-
ventils (8) mit der Sprührohrleitung (7) in Ver-
bindung steht und ein Einlass des Einwegventils
(8) mit der Außentrommel der Waschmaschine
in Verbindung steht, so dass durch Ein- oder
Ausschalten des Einwegventils (8) die Sprüh-
rohrleitung (7) mit der Außentrommel der
Waschmaschine in Verbindung gebracht oder
von ihr abgesperrt werden kann; und
zumindest ein Teil des Auslasses des Einweg-
ventils (8) in der Sprührohrleitung (7) angeord-
net ist.

2. Waschmaschine nach Anspruch 1, wobei die Luft-
druckverbindungs-
vorrichtung (2) an der Sprührohr-
leitung (7) angeordnet ist, die stromabwärts des
Wassereinlasses (1) der Waschmaschine positioni-
ert ist, mindestens eine Seite der Luftdruckverbindungs-
vorrichtung (2) in der Sprührohrleitung (7) ange-
ordnet ist und eine andere Seite der Luftdruckverbindungs-
vorrichtung (2) mit der äußeren Trommel
der Waschmaschine in Verbindung steht.
3. Waschmaschine nach Anspruch 2, wobei die Luft-
druckverbindungs-
vorrichtung (2) an der Sprührohr-
leitung (7) angeordnet ist und sich in der Nähe des
Wassereinlasses (1) befindet.
4. Waschmaschine nach einem der Ansprüche 1 bis 3,
wobei das Einwegventil (8) einen Ventilkörper (13)
und ein Ventilelement (14) umfasst, wobei das Ven-
tilelement (14) senkrecht zu einer Mittellinie der
Sprührohrleitung (7) angeordnet ist und sich in ver-
tikaler Richtung bewegt,
das Einwegventil (8) einen Einschaltzustand und ei-
nen Ausschaltzustand hat, die Außentrommel der
Waschmaschine durch eine Bewegung des Ventil-
elements (14) über das Einwegventil (8) mit der
Sprührohrleitung (7) in Verbindung treten oder von
dieser abgesperrt werden kann.
5. Waschmaschine nach einem der Ansprüche 1 bis 4,
wobei das Sprühsystem außerdem eine Druckbe-
aufschlagungsrippe (3) umfasst;
die Druckbeaufschlagungsrippe (3) in der Sprüh-
rohrleitung (7) angeordnet ist, stromabwärts des
Wasserstroms des Einwegventils (8) positioniert ist,
senkrecht zu einer Richtung des Wasserstroms
steht und sich in der Nähe des Einwegventils (8) be-
findet.
6. Waschmaschine nach einem der Ansprüche 1 bis 5,
wobei die Sprührohrleitung (7) an einer Wasserspei-
chertankabdeckung (12) der Waschmaschine ein-
stückig ausgebildet ist, die Luftdruckverbindungs-
vorrichtung (2) über die Wasserspeichertankabde-

ckung (12) mit einem Wasserspeichertank (11) der Waschmaschine in Verbindung steht und der Wasserspeichertank (11) mit der äußeren Trommel der Waschmaschine in Verbindung steht.

7. Waschmaschine nach Anspruch 6, wobei ein Strömungskanal in einem oberen Teil einer Außenseite der Wasserspeichertankabdeckung (12) ausgebildet ist, der Strömungskanal und die Wasserspeichertankabdeckung (12) einstückig ausgebildet sind, eine obere Abdeckung des Strömungskanals auf dem Strömungskanal angeordnet und an dem Strömungskanal befestigt ist und ein durch die obere Abdeckung des Strömungskanals und den Strömungskanal gebildeter Hohlraum die Sprühhrohrleitung (7) ist.

Revendications

1. Machine à laver comprenant un tambour extérieur et un système de pulvérisation, le système de pulvérisation comprenant :

une conduite de pulvérisation (7) avec une extrémité qui est une entrée d'eau (1),

caractérisée par

un dispositif de communication de pression d'air (2), un côté du dispositif de communication de pression d'air (2) communiquant avec la conduite de pulvérisation (7), et un autre côté du dispositif de communication de pression d'air (2) communiquant avec le tambour extérieur de la machine à laver,

cependant que le dispositif de communication de pression d'air (2) est une soupape unidirectionnelle (8), une sortie de la soupape unidirectionnelle (8) communiquant avec la conduite de pulvérisation (7) et une entrée de la soupape unidirectionnelle (8) communiquant avec le tambour extérieur de la machine à laver si bien que, en mettant en marche ou en arrêtant la soupape unidirectionnelle (8), la conduite de pulvérisation peut communiquer avec ou être coupée du tambour extérieur de la machine à laver et au moins une partie de la sortie de la soupape unidirectionnelle (8) est placée dans la conduite de pulvérisation (7).

2. Machine à laver selon la revendication 1, cependant que le dispositif de communication de pression d'air (2) est placé sur la conduite de pulvérisation (7) qui est positionnée en aval de l'entrée d'eau (1) de la machine à laver, au moins un côté du dispositif de communication de pression d'air (2) est placé dans la conduite de pulvérisation (7) et un autre côté du dispositif de communication de pression d'air (2) communique avec le tambour extérieur de la machi-

ne à laver.

3. Machine à laver selon la revendication 2, cependant que le dispositif de communication de pression d'air (2) est placé sur la conduite de pulvérisation (7) et est proche de l'entrée d'eau (1).
4. Machine à laver selon la revendication 1 à 3, cependant que la soupape unidirectionnelle (8) comprend un corps de soupape (13) et un élément de soupape (14), l'élément de soupape (14) est placé perpendiculaire à une ligne centrale de la conduite de pulvérisation (7) et se déplace dans une direction verticale, la soupape unidirectionnelle (8) a un état « marche » et un état « arrêt », le tambour extérieur de la machine à laver est autorisé à communiquer avec ou à être coupé de la conduite de pulvérisation (7) par la soupape unidirectionnelle (8) par un déplacement de l'élément de soupape (14).
5. Machine à laver selon l'une des revendications 1 à 4, cependant que le système de pulvérisation comprend de plus une nervure de pressurisation (3); la nervure de pressurisation (3) étant placée dans la conduite de pulvérisation (7), étant positionnée en aval de l'écoulement d'eau de la soupape unidirectionnelle (8), étant perpendiculaire à une direction de l'écoulement d'eau et étant proche de la soupape unidirectionnelle (8).
6. Machine à laver selon l'une des revendications 1 à 5, cependant que la conduite de pulvérisation (7) étant placée sur un couvercle du réservoir de stockage d'eau (12) de la machine à laver en en faisant partie intégrante, le dispositif de communication de pression d'air (2) communique avec un réservoir de stockage d'eau (11) de la machine à laver par le couvercle du réservoir de stockage d'eau (12), le réservoir de stockage d'eau (11) communique avec le tambour extérieur de la machine à laver.
7. Machine à laver selon la revendication 6, cependant qu'un canal d'écoulement est formé dans une partie supérieure d'un extérieur du couvercle du réservoir de stockage d'eau (12), le canal d'écoulement et le couvercle du réservoir de stockage d'eau (12) sont formés d'un seul tenant, un couvercle de dessus du canal d'écoulement est placé sur le canal d'écoulement et est fixé au canal d'écoulement et une cavité formée par le couvercle de dessus du canal d'écoulement et le canal d'écoulement est la conduite de pulvérisation (7).

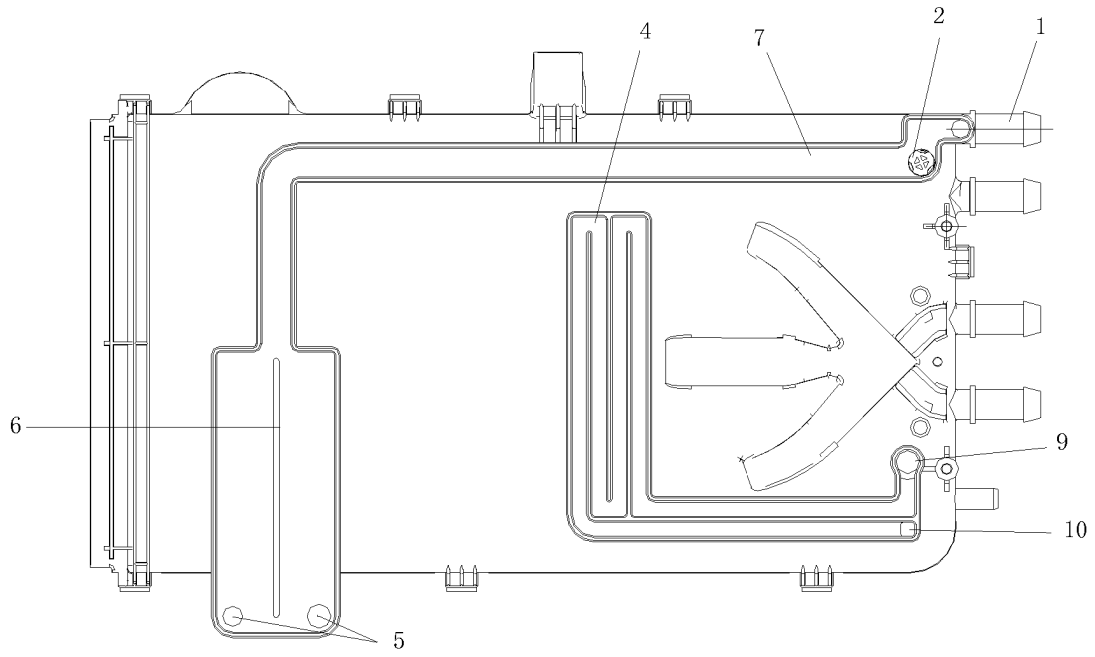


Fig. 1

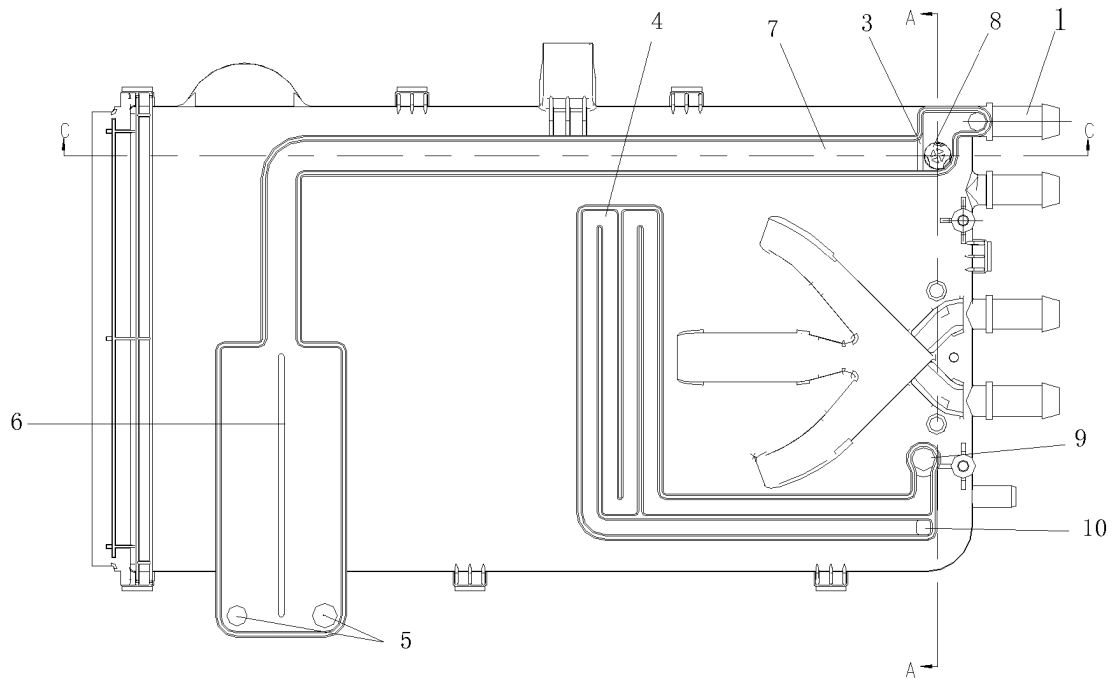


Fig. 2

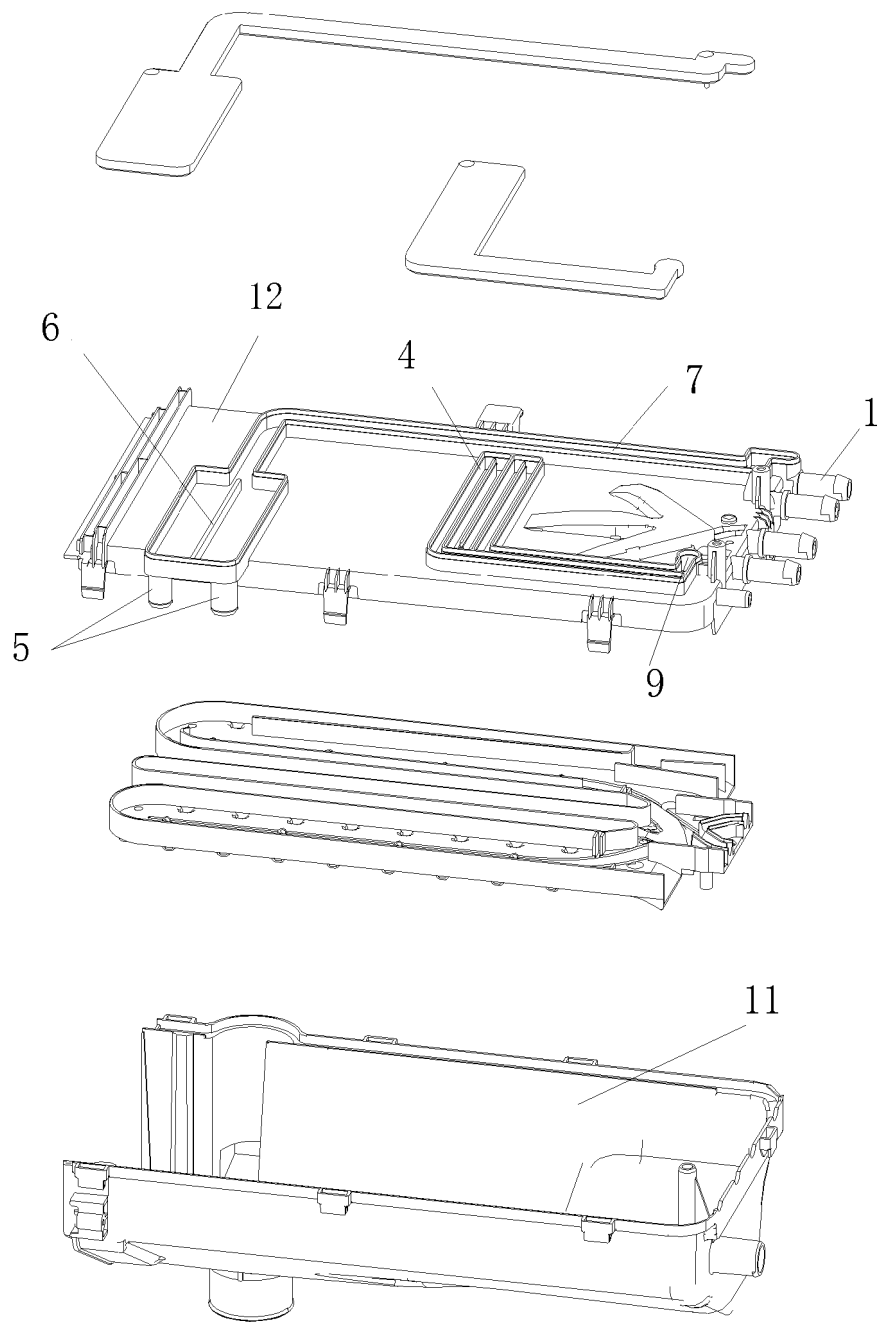


Fig. 3

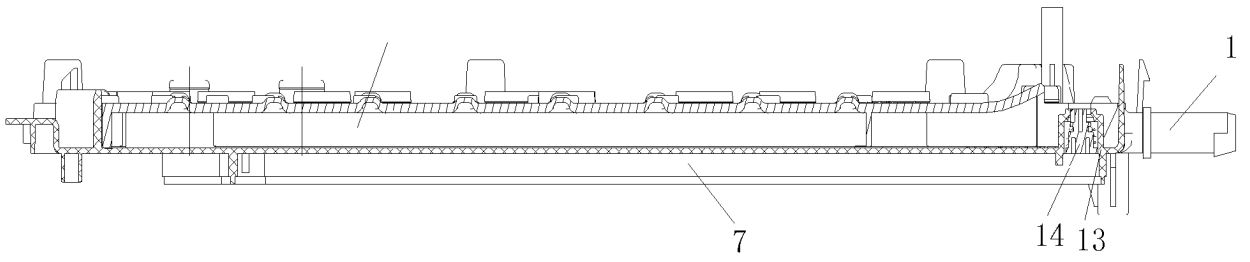


Fig. 4

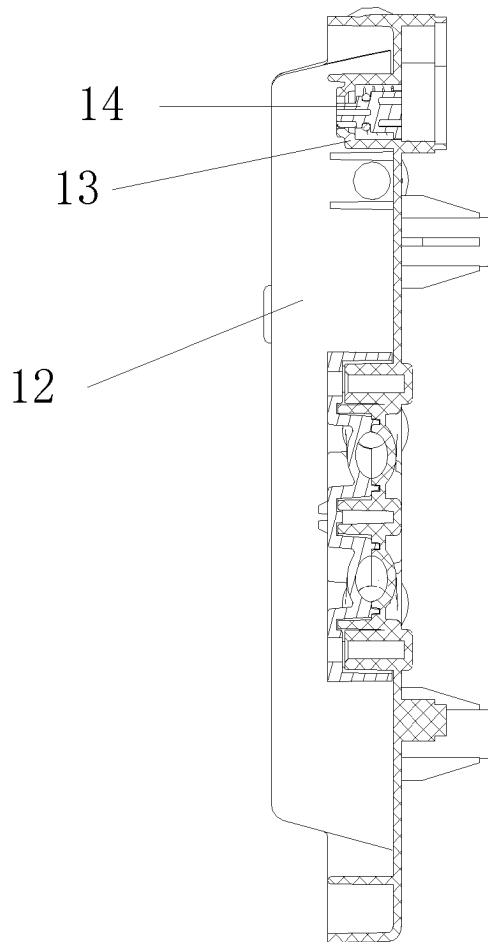


Fig. 5

REFERENCES CITED IN THE DESCRIPTION

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