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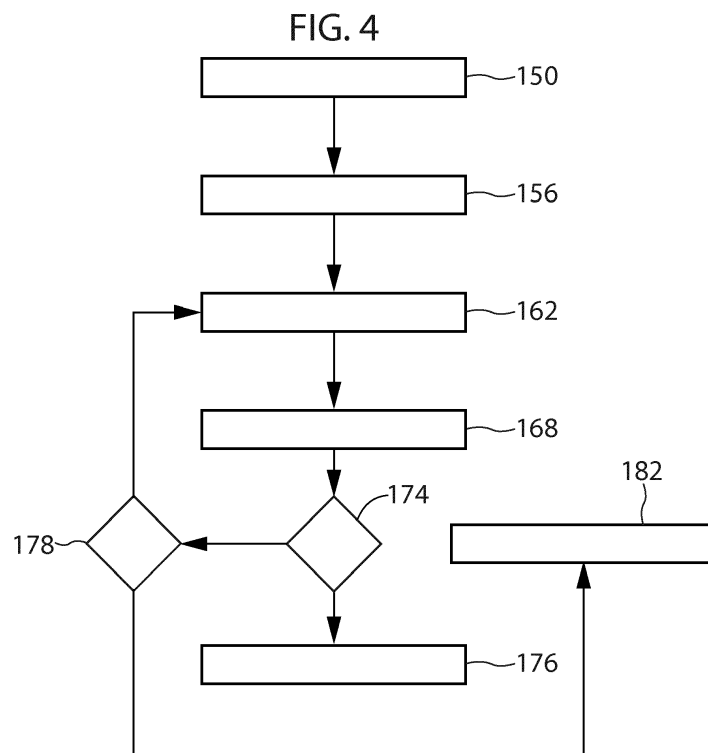
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(54) **METHOD FOR OPERATING A HOUSEHOLD APPLIANCE AND HOUSEHOLD APPLIANCE**

(57) Method for operating a household appliance (2), comprising a casing (6), at least one water circuit (100), and at least one valve (80) associated to said water circuit (100), whereby said appliance (2) performs at least one process in which water flows into and/or from said water circuit (100), whereby said at least one valve (80) is configured to allow and/or prevent water flow in said water

circuit (100) inside said appliance (2) through its activation or its deactivation, whereby during a predetermined period an anti-sticking procedure is performed in which in an alternating sequence said valve (80) is at least one time activated and subsequently deactivated or at least one time deactivated and subsequently activated.



Description

Field of the invention

[0001] The present invention concerns the field of household appliances. In particular, the present invention refers to a method for operating a household appliance.

Background Art

[0002] Nowadays the use of household appliances is widespread. Household appliance are, for example, refrigerators, cooling appliances, as well as laundry treatment machines, both "simple" laundry washing machines (i.e. laundry washing machines which can only wash and rinse laundry) and laundry washing-drying machines (i.e. laundry washing machines which can also dry laundry), or drying machines (i.e. drying machines which can dry laundry).

[0003] In the present description, the term "laundry treatment appliance" will refer to simple laundry washing machines, laundry washing-drying machines or drying machines. Laundry treatment appliances such as laundry washing machines generally comprise an external casing provided with a washing tub which contains a rotatable perforated drum where the laundry is placed. A loading/unloading door ensures access to the drum. Laundry treatment appliances typically comprise a water supply unit and a products supply unit, preferably a drawer, for the introduction of water and washing/rinsing products (i.e. detergent, softener, rinse conditioner, etc.) into the tub. Known laundry treatment appliances are also provided with water draining devices that may operate during different phases of the washing program to drain the dirty water.

[0004] According to the known art, a complete treating program typically includes different phases during which the laundry to be washed is subjected to adequate treatments. A treating cycle usually comprises a main washing phase during which the laundry is treated by means of water and a detergent. The water is typically heated to a predetermined temperature based on the washing program selected by the user. It is also possible that hot water is introduced into the tub from the hot water mains. During the main washing phase the drum is rotated, so as to apply also a mechanical cleaning action on the laundry. At the end of the main washing phase the drum is typically rotated at high rotational speed, so in such a way that dirty washing liquid (i.e. water mixed with detergent) is extracted from the laundry, and this dirty washing liquid is drained to the outside by the water draining devices.

[0005] A combined washer/dryer is built for washing and drying clothes and comprises a drying chamber into which the clothes to be dried are introduced. The drying chamber is rotatable supported within a cabinet and made to rotate by means of a driving motor, typically consisting of an electric motor connected to the drying chamber via a belt. The drying chamber usually is the drum, and one or more drying phases are added which typically commence after the rinsing phases. The drying phase usually involves rotating the drum and applying hot air to the laundry.

[0006] Household appliances, especially laundry treatment appliances, usually have a connection to water mains or to a water supply and comprise a water circuit into which water can be admitted through a water supply valve. Additionally or alternatively, further valve(s) can be provided configured to allow the water flow into this circuit, eventually and/or potentially into a branch of this circuit; for example, a discharge valve can be associated to a discharge circuit, allowing the discharge of the waste by the flowing of the water into a discharge circuit connected outside the machine. The valve typically comprises an obturator which can get blocked by dirt or particles, and the moveable part in the valve can be hindered from moving.

[0007] It is important that the admission of water into the circuit, the flowing inside the circuit, as well as the discharge of water are precisely controllable. Especially uncontrolled water flow due to a leaking valve in a stuck condition can lead to malfunctioning of and/or damage to the machine or even its environment.

Summary of the invention

[0008] The aim of the invention is to provide a method for operating a household appliance which prevents leakage or unwanted flow conditions in a water circuit in the appliance.

[0009] It is a further aim of the invention to provide a household appliance which prevents leakage or unwanted flow conditions in a water circuit in the appliance.

[0010] The invention therefore in a first aspect relates to a method for operating a household appliance, comprising a casing, at least one water circuit, and at least one valve associated to this water circuit, whereby the appliance performs at least one process in which water flows into and/or from the water circuit, whereby the at least one valve is configured to allow and/or prevent water flow in said water circuit inside the appliance through its activation or its deactivation, whereby during a predetermined period an anti-sticking procedure is performed in which in an alternating sequence the valve is at least one time activated and subsequently deactivated or at least one time deactivated and subsequently activated.

[0011] Preferred embodiments of the invention are described in relation to the dependent claims and the description of the enclosed drawings.

[0012] The invention is based on the consideration that the control of water flow and also of appropriate water levels is essential for the operation of a household appliance. An uncontrolled water flow or accumulation of water can cause damage to the appliance, its environment, and even the user. A common cause of uncontrolled wa-

ter flow is a valve associated to the water circuit which is not working properly, especially if in the state of deactivation or closing it is still admitting a flow of water through the valve. The valve basically gets stuck in between the positions of admission and blockage.

[0013] Applicant has found that these unwanted conditions can be reduced or fully prevented if the valve undergoes an anti-sticking procedure in which the valve activation state is changed in an alternating fashion. In this way, potentially present dirt or particle or blocking film of waste material are removed from the space between the movable components (such as a valve obturator) and the fixed components (such as the obturator seat), allowing the restoring of the valve correct working; this removal is due to the quick movement of the movable components with respect to the fixed components, resulting in a sudden abutment of the movable components to their positions corresponding to the activation and the deactivation of the valve

[0014] The valve is preferably arranged inside the casing of the appliance.

[0015] The sequence advantageously comprises between 3 and 10 activations and deactivations of the valve. Applicant has discovered that this range is an advantageous trade-off between the success rate of the procedure and the time needed for this procedure. If the valve after 10 sequences does not reach a non-stuck state, it is probable that more state changes will not alter this situation and it is preferable to notify the user.

[0016] Preferably the sequence comprises at least 5 activations and deactivations of the valve.

[0017] The time interval between an activation and subsequent deactivation or deactivation and subsequent activation is preferably between 1 and 5 seconds. In a valve with an obturator, the mechanical features of the valve, especially the inertia of the obturator, constrain the time interval between subsequent activation changes. The electronical availability of the valve is usually much faster.

[0018] The present invention is preferably based on the fact that a quick alternation from the activation and the deactivation state or vice versa is performed to unblock the movable part(s) of the valve from its seat. A quick alternation as is intended is an alternation between the activation and deactivation state or vice versa in such a time that the reached state is not maintained as long as to stabilize the fluid dynamic state internally to the valve. Preferably each alternation from the activation and the deactivation state is obtained by the change of the state immediately after the previous state has been reached, in which for immediately it is preferably intended the available time of the system (valve assembly) to change the state without any imposed waiting time.

[0019] The predetermined time for during which the procedure is performed is therefore essentially given by the number of activation state changes (activated to deactivated; deactivated to activated).

[0020] The procedure is advantageously performed

each time after the valve has been activated and/or the valve has been deactivated in a regular operation of the household appliance, i.e. not during the anti-sticking-procedure itself. In this way, a precaution is done each time the valve has been activated or deactivated.

[0021] Alternatively, the procedure is performed after the last deactivation of the valve has been performed, in case of a programmed sequence of activation and deactivation of the valve.

[0022] In a preferred embodiment, the procedure is performed after a triggering event. A triggering event is an event which corresponds to a predefined condition of the appliance.

[0023] Preferably, the triggering event is an alarm and/or a detected water leakage. In both cases, the procedure can possibly help to stop the condition causing the alarm and/or the water leakage.

[0024] Advantageously, the procedure is performed if after the deactivation of the valve a measured flow in the circuit is larger than a threshold flow value and/or a water level in the circuit is larger than a threshold level value. In this way, an inadmissible condition can be reliably detected, while small flow rates or water levels which can occur during the operation of the household appliance can be considered as regular appearances.

[0025] Preferably, the appliance is a washing machine or combined washer/dryer and comprises a tub into which water is introduced during a washing process and the valve is an inlet valve which allows the flow of water into the tub. In this case, preferably, the water level is measured in the tub and/or at the floor of the appliance in a bottom tank arranged at the floor of the appliance. During regular operations, water is not supposed to reach the floor of the appliance; an occurrence of water flow or a build-up of water at the floor of the appliance in the tank is therefore a reliable signal for an unusual condition which is possibly hazardous. The water flow is measured in the water circuit.

[0026] In a preferred embodiment, the appliance comprises a flow meter measuring the water flow inside the water circuit, whereby the procedure is performed if after the deactivation of the valve the flow meter still detects a water flow.

[0027] Preferably, if the measured flow is still larger than a threshold flow value after performing the sequence, the sequence is repeated. In an alternative preferred embodiment, the sequence is repeated if a flow is detected, especially if the flow rate is larger than a flow threshold value. The sequence can be repeated one more time or more than one time.

[0028] In a preferred embodiment, the appliance comprises a water level detector measuring the water level inside the water circuit and/or a component associated to the water circuit, whereby the procedure is performed if after the deactivation of the valve the water level detector still detects an increasing water level.

[0029] Preferably, if the water level is still increasing after performing the sequence, the sequence is repeated.

The sequence can be repeated one more time or more than one more time. The number of repetitions preferably depends on the water level and/or its increase rate and/or an assessment of the success rate of performing a further sequence.

[0030] In a preferred embodiment an apparatus or device is provided which detects a leakage in the water circuit, whereby if the leakage is detected, the procedure is performed and/or water is drained from the water circuit.

[0031] Preferably, the apparatus is an anti-flooding device. It can in a preferred variant comprise a pipe which is arranged coaxially to a water guiding pipe through which water is flowing into the water circuit. If the water guiding pipe is broken, water flows into the space between the two coaxially arranged pipes and can be detected by the anti-flow meter / water level detector.

[0032] Advantageously, if the leakage is detected, an alarm is issued. The alarm is preferably issued as a visual and/or acoustic signal.

[0033] Advantageously, if the water level is still rising after the sequence has been performed for a prescribed number of times, an alarm is issued. In this case, a distinct activation state (activated, deactivated) of the valve cannot be realized by the procedure and a notification of the user is useful to make her or him notice the abnormal state of the machine.

[0034] In a preferred embodiment, the household appliance is a laundry treatment appliance, and whereby the at least one valve is a water supply valve associated to the water supply circuit, whereby at least one washing cycle with a water loading procedure is performed, and whereby the anti-sticking procedure is performed at the end of the, preferably each, respective water loading procedure during the washing cycle.

[0035] Preferably, the at least one valve comprises a plunger moveable to and from a valve seat, whereby in the deactivated state the plunger is sitting on the valve seat, and whereby the sequence involves moving the plunger away from the valve seat and back to the valve seat.

[0036] Preferably, the valve comprises a solenoid actuator for moving the plunger.

[0037] In a second aspect the invention relates to a household appliance, comprising a casing, at least one water circuit, and at least one valve associated to the water circuit, whereby the appliance performs at least one process in which water flows into and/or from the water circuit, whereby the at least one valve is configured to allow and/or prevent water flow in the water circuit inside the appliance through its activation or its deactivation, whereby a control unit is provided which is configured to perform a method described above.

[0038] The advantages of the invention are especially as follows. The anti-sticking procedure aids to bring a valve back into a distinct activation state, thereby preventing water leakage and damages to the user and/or the appliance. Since water inside the appliance can also

lead to malfunctions or electronic components, the lifetime of the appliance is prolonged. Performing the anti-sticking sequence several times enhances the chance that the valve reaches a distinct activation state.

Brief description of the drawings

[0039] Further features and advantages of the present invention shall become clearer from the following detailed description of some of its preferred embodiments, made with reference to the attached schematic drawings and given as an indication and not for limiting purposes.

[0040] In particular, the attached drawings are included to provide a further understanding of the invention and are incorporated in and constitute a part of this specification. The drawings together with the description explain the principles of the invention. In the drawings, corresponding characteristics and/or components are identified by the same reference numbers. In these drawings:

FIG. 1 shows a front loading washing machine in a preferred embodiment;

FIG. 2 shows the front loading washing machine of FIG. 1 in a schematic view;

FIG. 3 shows a flow chart of a method for operating a household appliance in a first preferred embodiment;

FIG. 4 shows a flow chart of a method for operating a household appliance in a second preferred embodiment; and

FIG. 5 shows a flow chart of a method for operating a household appliance in a third preferred embodiment.

[0041] In FIGs. 1 and 2, a household appliance 2 is shown which is built as a front-loading washing machine and comprises housing or casing 6 with a preferable parallelepiped shape, the casing 6 comprising a front wall 10, two side walls 14, a cover plate 20 and a rear wall (not shown). Front wall 10 and side walls 14 are preferably part of a cabinet. A front door 24 is provided which can be opened for loading or unloading laundry through an opening 28 into a washing drum and which can be closed. Door 24 can be operated, especially opened and closed, by a handle 26.

[0042] Advantageously a washing tub 30 is contained within casing 6, whereby a rotatable and perforated drum 36 is contained by the washing tub 30. Both washing tub 30 and drum 36 have a substantially cylindrical shape. Advantageously the tub 30 is suspended in a floating manner inside casing 6 by means of a number of coil springs and shock absorbers. The drum 36 is rotated by an electric motor, which transmits the rotating motion of a motor shaft to the drum by a belt/pulley system. In a

different embodiment of the invention, the motor can be directly associated with the shaft of the drum. The tub 30 is preferable connected to casing 6 by means of an elastic bellows or gasket. Tub 30 preferably comprises two complementary hemi-shells structured for being reciprocally coupled to form tub 30.

[0043] Alternatively, the laundry appliance can be another type of laundry treatment machine such as a combined washer and dryer.

[0044] The preferred washing machine shown in FIG. 1 on a front panel 40 comprises a drawer 42 with a front plate 34 and a handle 36 for pulling out and pushing back in drawer 42. Drawer 42 comprises at least one compartment or dispenser 118 for detergent or washing additives. Adjacent to drawer 42, preferably a rotatable or rotary knob 38 is arranged for selecting a laundry treatment program and/or at least one parameter of a laundry treatment program. Preferably, knob 38 has also a push functionality and can be pressed for selected and/or confirmation of selected options. Knob 38 is provided on a user interface 62 which can provide further indicating and/or control elements (not shown). Knob 38 is preferably arranged on front panel 40 adjacent to drawer 42.

[0045] On front panel 40, a display 50 is arranged on user interface 62. Display 50 comprises a dedicated area 54.

[0046] An inlet valve 80 is connected to the water mains E and in an activated state allows water to flow through a water pipe 82 into the tub 30. Water can flow from tub 30 through a pipe 90 and through a water pipe 92 to a discharge pump 88, which can pump water into a discharge pipe 94.

[0047] Pipes 82, 90, 92, and 94 are only indicated schematically and also can be realized by a different number of pipes, as long as they allow water to enter the tub 30 on demand and be discharged again on demand. Pipes 82, 90, 92, 94, valve 80 and tub 30 build a water circuit 100. A flow-meter 110, which is preferably arranged between valve 80 and dispenser 118, measures 110 the water flow inside tub 30. A water level detector 114 is provided measuring the water level inside tub 30. Preferably, a further water level detector (not shown) is provided at the bottom of the housing or casing 6, preferably in a tank arranged at the bottom of casing 6 in which water can collect. A filter 136 is arranged between pipe 92 and discharge pump 88.

[0048] When valve 80 is activated, water flows from mains E through valve 80 through at least one compartment of a dispenser 118 which provided in drawer 42, through tub 30, discharge pump 88 and discharge pipe 94. Alternatively, water can flow through valve 80 and through a dedicated channel by-passing the dispenser 118, allowing the water to flow directly to the tub 30.

[0049] FIG. 2 further shows a control unit 130 with via signal lines 105 activates valve 80 and receives signals from flow meter 110 and water level detector 114.

[0050] Household appliance 2 preferably comprises a discharge valve comprising a valve body 142 and a valve

seat 148 which is built as a diaphragm with an opening arranged between tub 30 and water pipe 92. A ball 140, which acts as valve element, is freely moveable or floatable between valve seat 148 and filter 136 and is adapted to engage with valve seat 148 to shut the tub 30 from the water pipe 92. The ball 140 is made of floatable material, e.g. plastic, and floats on the water depending on the water level in the valve body 142 / draining suction pipe 92.

[0051] A first preferred embodiment of a method for operating a household appliance is shown as flow chart in FIG. 3 and is discussed in relation to the appliance 2 shown in FIGs. 1 and 2.

[0052] In a first step 150, during a water loading procedure during a washing cycle, valve 80 is preferably activated and thereby opened to allow water to flow from the water mains into tub 30. The activation of valve 80 results in opening valve 80, i.e. valve 80 assuming an opened state, thereby allowing a flow of water through valve 80. The deactivation of valve 80 results in closing valve 80 or valve 80 assuming a closed state, preventing water from flowing through the valve 80. In the opened state, water can flow from mains E through dispenser 118 into tub 30 or directly into tub 30, while in the closed state, this flow is prevented.

[0053] During the procedure in which valve 80 is open and water is flowing into tub 30, preferably the water level in tub 30 is detected by the water level detector 114. Once the desired water level has been reached in the tub 30, in a subsequent step 156 the valve 80 is deactivated again. Valve 80 is preferably an electro valve and which preferably acts as an electronically controllable inlet valve comprising a plunger moveable to and from a valve seat, whereby in the deactivated state the plunger is sitting on the valve seat. In an activated state, the plunger is positioned away from the seat. The valve 80 further comprises a solenoid actuator for moving the plunger.

[0054] Household appliance 2 in a preferred embodiment comprises an anti-flooding device, in which in case a water leakage occurs inside the machine, the flow meter 125 detects a water passage or a water level sensor provided on the bottom of the machine detects the water level increasing.

[0055] During activation and/or deactivation of valve 80 during the water loading into tub 30, it can happen that the valve 80 does not reach the desired final activation state. Reasons for this stuck condition of the valve 80 can be dirt particles or a blocking film of waste material between the plunger and the seat of valve 80. For other valves, depending on their concrete arrangement, also fluff or lint could lead to a stuck condition.

[0056] There is specially the danger that the valve 80 remains stuck open. The plunger inside the electro valve is not able to work properly and the valve 80 is still opened when it is switched off. In this state it still allows a water passage which can lead to flooding of the tub 30 and/or other parts of the machine. Electronic components of the appliance 2 can encounter short circuits.

[0057] In order to prevent a stuck condition, which is an ill-defined activation state of the valve 80, the method performs an anti-sticking procedure in a subsequent step 162. During this procedure, the valve 80 is in an alternating fashion activated and deactivated, preferably several times. For example, in a preferred variant, the valve 80 is subsequently activated, deactivated, activated, deactivated, activated, deactivated, activated, deactivated (5 times activation/deactivation), reaching a final state which corresponds to the desired deactivated state. This sequence involves moving the plunger away from the valve seat and back to the valve seat. The described anti-sticking procedure involves therefore a repeated quick movement of the moveable components of valve 80, especially the plunger, with respect to the fixed components, especially the seat. This results in a repeated sudden abutment of the moveable components to their positions corresponding to the activation and the deactivation of the valve. During these movements and abutments of the at least one moveable component, dirt particles and the like which prevent the valve 80 from assuming a defined opened or closed position are moved and change their position and finally can escape the valve 80. In this way, the proper functioning of valve 80 is restored.

[0058] Steps 150, 156, and 162 are preferably always performed during a water loading procedure. Preferably, steps 156 and 162 are always performed when valve 80 has been activated. The activations and deactivations of valve 80 are performed by control unit 130.

[0059] A method in a second preferred embodiment is shown in FIG. 5. Steps 150, 156, and 162 are performed as in the embodiment discussed in FIG. 3. In a first step 150, during a water loading procedure during a washing cycle, valve 80 is preferably activated and thereby opened to allow water to flow from the water mains into tub 30. Once the desired water level has been reached in the tub 30, in a subsequent step 156 the valve 80 is deactivated again. In order to prevent a stuck condition, which is an illdefined activation state of the valve 80, the method performs an anti-sticking procedure in a subsequent step 162. During this procedure, the valve 80 is in an alternating fashion activated and deactivated, preferably several times.

[0060] In a step 168, the flow meter 110 measures the water flow and/or the water level detector 114 measures the water level in tub 30 after the anti-sticking procedure has been performed for a predetermined amount of time. Since valve 80 has been controlled in such a way that it should reach the deactivated state in which water flow into tub 30 is prevented, there should be no more water flow into the tub 30 and the water level in the tub should reach a steady state.

[0061] In a decision 174, if no more water flow or rise of water is detected, the method branches to a step 176 in which the current process, such as the washing process, is continued. If water flow and/or water level rise are detected, the method branches to a decision 178 in which

it is decided if it branches back to step 162, thereby repeating again the anti-sticking procedure, or if it branches to a step 182. The decision 178 depends preferably on the number of times the method has branched back to step 162. If it has branched back to step 162 for a predefined number of times, it branches from decision 178 to step 182, in which an alarm is raised. In this case, a repetition of the anti-sticking procedure has not resolved the problem of water still flowing into the tub, and the user is alerted about this possibly hazardous condition.

[0062] A method in a further preferred embodiment is shown in FIG. 5. In a first step 150, during a water loading procedure during a washing cycle, valve 80 is preferably activated and thereby opened to allow water to flow from the water mains into tub 30. Once the desired water level has been reached in the tub 30, in a subsequent step 156 the valve 80 is deactivated again. In order to prevent a stuck condition, which is an ill-defined activation state of the valve 80, the method performs an anti-sticking procedure in a subsequent step 162. During this procedure, the valve 80 is in an alternating fashion activated and deactivated, preferably several times.

[0063] In a step 168, the household appliance detects if after the deactivation of valve 80, water is still flowing in water circuit 100. This detection is preferably performed by an anti-flooding device which detects water flow in the circuit between water mains E and the discharge pipe 94. The water flow can preferably be measured by a water level sensor which is arranged at the bottom of the housing 6 of appliance 2. Preferably, a tank is arranged at the bottom of appliance 2 in which water can gather and in which the water level is measured by the water level sensor. Since valve 80 has been controlled in such a way that it should reach the deactivated state in which water flow into tub 30 is prevented, there should be no water flow detected the water level sensor at the bottom of the machine / the anti-flooding device.

[0064] In a decision 174, if no more water flow or rise of water is detected, the method branches to a step 176 in which the current process, such as the washing process, is continued. If water flow and/or water level rise are detected, the method branches to a decision 178 in which it is decided if it branches back to step 162, thereby repeating again the anti-sticking procedure, or if it branches to a step 182. The decision 178 depends preferably on the number of times the method has branched back to step 162. If it has branched back to step 162 for a predefined number of times, it branches from decision 178 to step 182, in which an alarm is raised. In this case, a repetition of the anti-sticking procedure has not resolved the problem of water still flowing into the tub, and the user is alerted about this possibly hazardous condition.

[0065] The invention thus conceived can be subjected to numerous modifications and variants all falling within the scope of the inventive concept. Additionally or alternatively, further valve(s) can be provided configured to

allow the water flow into the circuit, eventually into a branch of said circuit. For example, a discharge valve can be associated to a discharge circuit, allowing the discharged of the waste by the flowing of the water into a discharge circuit connected outside the machine.

[0066] In addition, all details can be replaced by other technically equivalent elements. In practice, all the materials used, as well as the shapes and contingent dimensions, may vary depending on the requirements without departing from the scope of protection of the following claims.

Claims

1. Method for operating a household appliance (2), comprising a casing (6), at least one water circuit (100), and at least one valve (80) associated to said water circuit (100), whereby said appliance (2) performs at least one process in which water flows into and/or from said water circuit (100),
characterized in that
said at least one valve (80) is configured to allow and/or prevent water flow in said water circuit (100) inside said appliance (2) through its activation or its deactivation, whereby during a predetermined period an anti-sticking procedure is performed in which in an alternating sequence said valve (80) is at least one time activated and subsequently deactivated or at least one time deactivated and subsequently activated.
2. Method according to claim 1, whereby said sequence comprises between 3 and 10 activations and deactivations of said valve (80).
3. Method according to claim 2, whereby said sequence comprises at least 5 activations and deactivations of said valve (80).
4. Method according to one of the claims 1 to 3, whereby the time interval between an activation and subsequent deactivation or deactivation and subsequent activation is between 1 and 5 seconds.
5. Method according to one of the claims 1 to 4, whereby said procedure is performed each time after said valve (80) has been activated and/or said valve (80) has been deactivated.
6. Method according to one of the claims 1 to 5, whereby said procedure is performed after a triggering event.
7. Method according to claim 6, whereby said triggering event is an alarm and/or a detected water leakage.
8. Method according to one of the claims 1 to 7, where-

by said procedure is performed if after the deactivation of said valve (80) a measured flow in said circuit (100) is larger than a threshold flow value and/or a measured water level in said circuit (100) is larger than a threshold level value.

9. Method according to claim 8, whereby said appliance (2) comprises a flow meter (110) measuring the water flow inside said water circuit (100), and whereby said procedure is performed if after the deactivation of said valve (80) the flow meter (110) still detects a water flow.
10. Method according to claim 8 or 9, whereby, if said measured flow is still larger than a threshold flow value after performing said sequence, said sequence is repeated.
11. Method according to claim 8, whereby said appliance (2) comprises a water level detector (114) measuring the water level inside said water circuit (100) and/or inside a component associated to said water circuit (100), and whereby said procedure is performed if after the deactivation of said valve (80) said water level detector (114) still detects an increasing water level.
12. Method according to one of the claims 8 to 11, whereby, if said water level is still increasing after performing said sequence, said sequence is repeated.
13. Method according to one of the claims 8 to 12, whereby an apparatus is provided which detects a leakage in said water circuit (100), whereby if said leakage is detected, said procedure is performed and/or water is drained from said water circuit (100).
14. Method according to one of the claims 1 to 13, whereby said appliance (2) is a laundry treatment appliance, and whereby said at least one valve (80) is a water supply valve associated to said water supply circuit (100), whereby at least one washing cycle with a water loading procedure is performed, and whereby said anti-sticking procedure is performed at the end of said respective water loading procedure during said washing cycle.
15. Household appliance (2), comprising a casing (6) at least one water circuit (100), and at least one valve (80) associated to said water circuit (100), whereby said appliance (2) performs at least one process in which water flows into and/or from said water circuit, **characterized in that**
said at least one valve (80) is configured to allow and/or prevent water flow in said water circuit (100) inside said appliance (2) through its activation or its deactivation and that a control unit (130) is provided which is configured to perform a method according

to one of the previous claims.

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FIG. 1

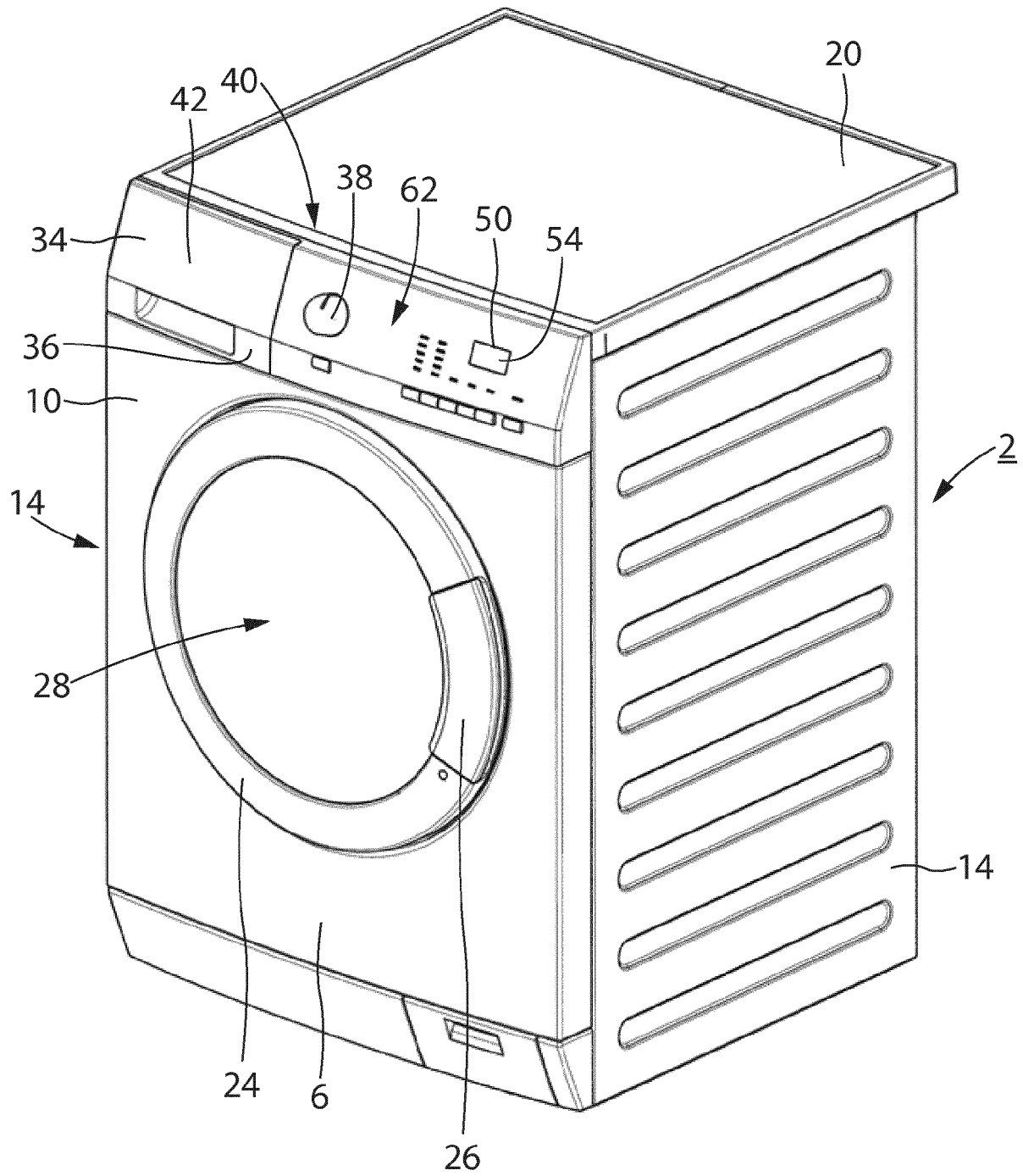


FIG. 2

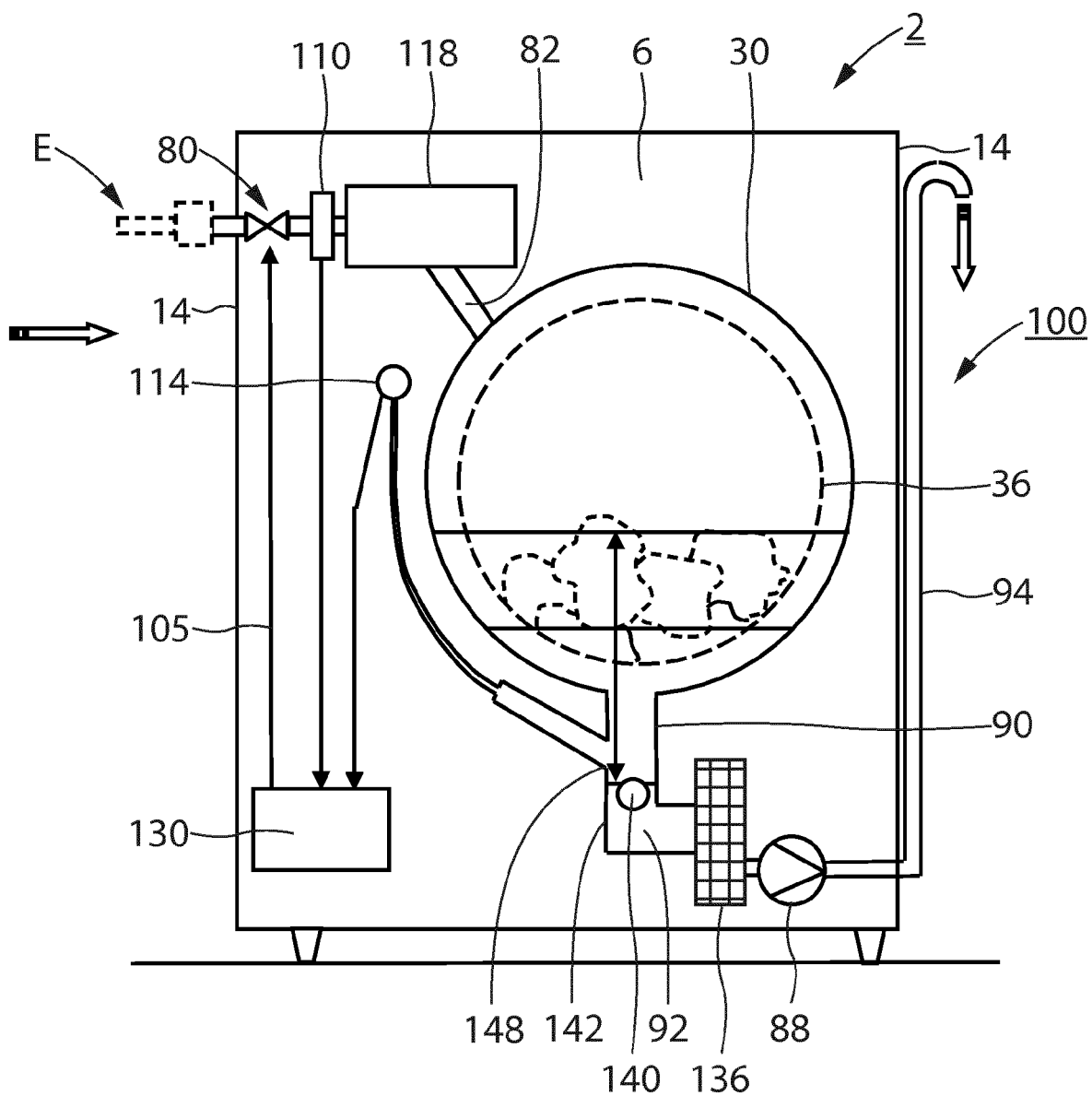


FIG. 3

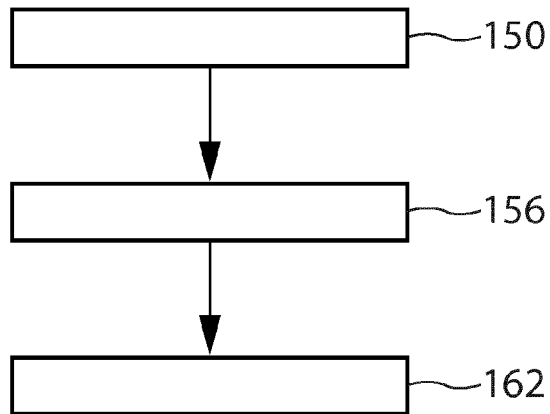


FIG. 4

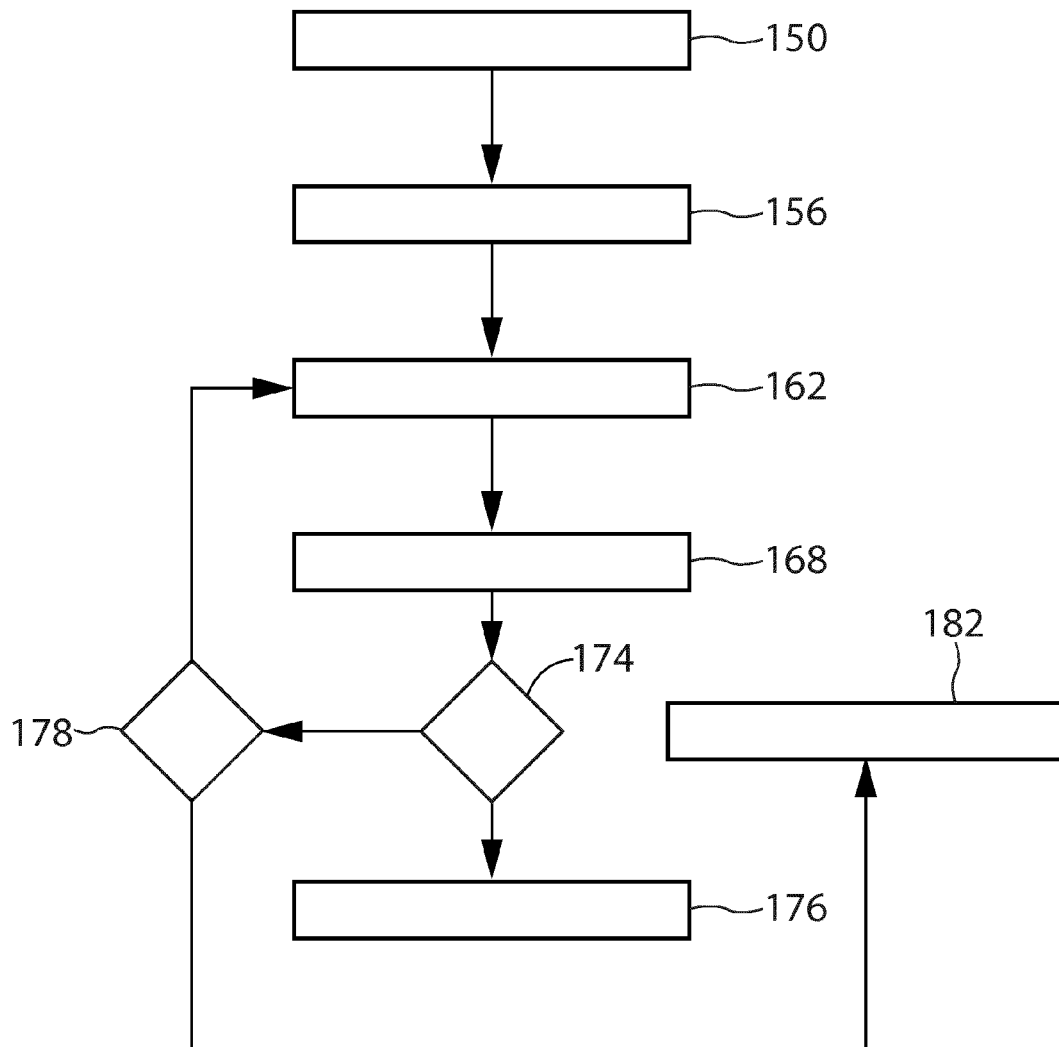
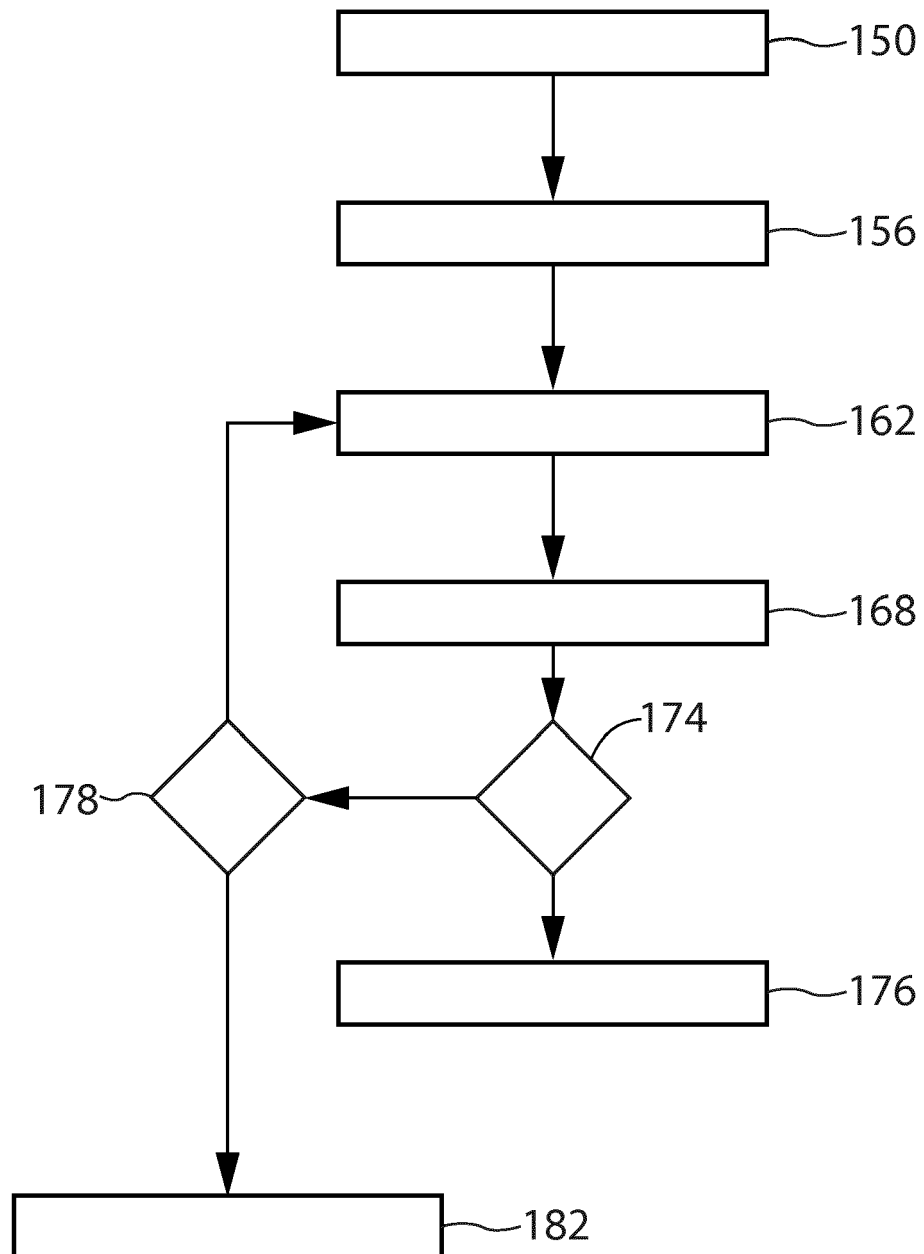


FIG. 5





EUROPEAN SEARCH REPORT

Application Number
EP 16 18 2484

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DOCUMENTS CONSIDERED TO BE RELEVANT			
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CATEGORY OF CITED DOCUMENTS X : particularly relevant if taken alone Y : particularly relevant if combined with another document of the same category A : technological background O : non-written disclosure P : intermediate document T : theory or principle underlying the invention E : earlier patent document, but published on, or after the filing date D : document cited in the application L : document cited for other reasons & : member of the same patent family, corresponding document			

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5 This annex lists the patent family members relating to the patent documents cited in the above-mentioned European search report.
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