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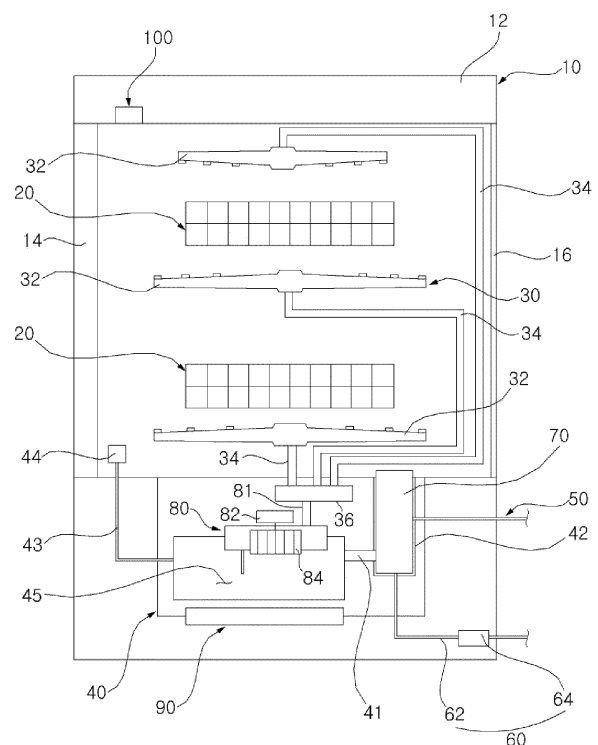
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(54) **CONTROL METHOD OF DISHWASHER**

(57) Disclosed is a control method of a dishwasher including supplying steam generated in a sump (40) to a filter assembly (70) to self-clean the filter assembly at the time of operating the dishwasher (a pre-filter cleaning cycle), wherein the pre-filter cleaning cycle includes driving a water supply module (50) to supply wash water to the sump before operating the dishwasher (a pre-operation water supply step), driving a heater module (90) to generate steam in the sump and supplying the generated steam to the filter assembly (70) to clean the filter assembly (a pre-cleaning steam generation and supply step) after the pre-operation water supply step, and driving a drainage module (60) to drain the wash water (a pre-cleaning drainage step) after the pre-cleaning steam generation and supply step. In the control method of the dishwasher, steam is supplied to the filter assembly (70) before or after washing dishes (a washing cycle) in order to self-clean the filter assembly.

FIG. 1



Description

CROSS-REFERENCE TO RELATED APPLICATION

[0001] This application claims the priority benefit of Korean Patent Application No. 10-2014-0109475, filed on August 22, 2014, the disclosure of which is incorporated herein by reference.

BACKGROUND

1. Field

[0002] The present disclosure relates to a control method of a dishwasher.

2. Description of Related Art

[0003] A dishwasher is an electric home appliance that sprays high-pressure wash water onto dishes through a spray nozzle to remove food waste from the surfaces of the dishes.

[0004] A conventional dishwasher includes a tub having a washing space defined therein and a sump mounted at the bottom of the tub to store wash water.

[0005] The wash water in the sump is moved to the spray nozzle by a pumping action of a washing pump mounted in the sump. The wash water moved to the spray nozzle is sprayed at a high pressure through a spray port formed in the end of the spray nozzle. The wash water sprayed at the high pressure strikes the surfaces of the dishes. As a result, garbage, such as food waste, is separated from the dishes, and then falls to the bottom of the tub.

[0006] A filter is disposed between the sump and the tub to filter foreign matter from the wash water.

[0007] In the conventional dishwasher, foreign matter on the filter is dried or hardened upon repeated use of the dishwasher with the result that the performance of the filter is reduced. A user must periodically clean the filter of the dishwasher in order to maintain optimum performance of the dishwasher. Typically, the filter is not cleaned periodically due to the user's lack of understanding or the user's poor knowledge of how to use the dishwasher, which leads to various problems.

[0008] An example of a conventional dishwasher is disclosed, for example, in Korean Registered Patent No. 10-1235952.

SUMMARY

[0009] Therefore, the present disclosure has been made in view of the above problems, and the present disclosure provides a dishwasher that is capable of automatically cleaning a filter assembly.

[0010] The present disclosure provides a dishwasher that is capable of minimizing the amount of foreign matter attached to a filter assembly, thereby provide consistent

washing force.

[0011] The present disclosure provides a dishwasher that is capable of sterilizing or deodorizing a filter assembly or removing foreign matter from the filter assembly before a washing cycle, thereby preventing contamination in the washing cycle.

[0012] The present disclosure provides a dishwasher that is capable of supplying an organic acid into a tub during sterilization or deodorization of a filter assembly or removal of foreign matter from the filter assembly using steam, thereby removing scale attached to the inside of the tub and restraining scale from being formed in the tub.

[0013] Aspects of an invention are defined in the appended independent claims.

[0014] There is provided a control method of a dishwasher including supplying steam generated in a sump to a filter assembly to self-clean the filter assembly at the time of operating the dishwasher (a pre-filter cleaning cycle), wherein the pre-filter cleaning cycle includes driving a water supply module to supply wash water to the sump before operating the dishwasher (a pre-operation water supply step), driving a heater module to generate steam in the sump and supplying the generated steam to the filter assembly to clean the filter assembly (a pre-cleaning steam generation and supply step) after the pre-operation water supply step, and driving a drainage module to drain the wash water (a pre-cleaning drainage step) after the pre-cleaning steam generation and supply step.

[0015] The control method may further include driving the drainage module to drain the wash water stored in the sump (a pre-operation drainage step) before the pre-filter cleaning cycle.

[0016] The pre-filter cleaning cycle may be performed periodically.

[0017] The control method may further include supplying an organic acid into a tub through an organic acid module (an organic acid supply step) at a time of at least one selected from among before the pre-operation water supply step, after the pre-operation water supply step, and during the pre-operation water supply step.

[0018] The control method may further include determining the number of times that dishes have been washed (i.e. the number of washing cycles) before the pre-operation water supply step.

[0019] The control method may further include washing dishes (a washing cycle) after the pre-cleaning drainage step.

[0020] The control method may further include supplying the steam generated in the sump to the filter assembly to self-clean the filter assembly before finishing the operation of the dishwasher (a post-filter cleaning cycle), wherein the post-filter cleaning cycle may include driving the water supply module to supply new wash water to the sump (a post-cleaning water supply step), driving the heater module to generate steam in the sump and supplying the generated steam to the filter assembly to clean the filter assembly (a post-cleaning steam generation and supply step) after the post-cleaning water supply step,

and driving the drainage module to drain the wash water (a post-cleaning drainage step) after the post-cleaning steam generation and supply step.

[0021] The post-filter cleaning cycle may be performed periodically.

[0022] The control method may further include supplying an organic acid into a tub through an organic acid module (an organic acid supply step) at a time of at least one selected from among before the post-cleaning water supply step, after the post-cleaning water supply step, and during the post-cleaning water supply step.

[0023] There is further provided a control method of a dishwasher including supplying steam generated in a sump to a filter assembly to self-clean the filter assembly at the time of operating the dishwasher (a pre-filter cleaning cycle), washing dishes (a washing cycle) after the pre-filter cleaning cycle, and supplying the steam generated in the sump to the filter assembly to self-clean the filter assembly (a post-filter cleaning cycle) after the washing cycle.

[0024] There is yet further provided a control method of a dishwasher including self-cleaning a filter assembly before finishing operation of the dishwasher (a post-filter cleaning cycle), wherein the post-filter cleaning cycle includes driving a water supply module to supply wash water to a sump (a post-cleaning water supply step), driving a heater module to generate steam in the sump and supplying the generated steam to the filter assembly to clean the filter assembly (a post-cleaning steam generation and supply step) after the post-cleaning water supply step, and driving a drainage module to drain the wash water (a post-cleaning drainage step) after the post-cleaning steam generation and supply step.

[0025] There is also provided a control method of a dishwasher in a case in which a user selects a specific course, the control method including driving a drainage module to drain wash water stored in a sump (a pre-operation drainage step), driving a water supply module to supply new wash water to the sump (a pre-operation water supply step), driving a heater module to generate steam in the sump and supplying the generated steam to a filter assembly to clean the filter assembly (a pre-cleaning steam generation and supply step), supplying an organic acid into a tub through an organic acid module (an organic acid supply step) at a time of at least one selected from among before the pre-cleaning steam generation and supply step, after the pre-cleaning steam generation and supply step, and during the pre-cleaning steam generation and supply step, spraying the wash water stored in the sump into the tub through a spray module (a rinsing step), and heating the interior of the tub to dry the interior of the tub (a drying step).

[0026] There is also provided a control method of a dishwasher including driving a drainage module to drain wash water stored in a sump (a pre-operation drainage step), driving a water supply module to supply new wash water to the sump (a pre-operation water supply step), supplying an organic acid into a tub through an organic

acid module (an organic acid supply step) at a time of at least one selected from among before the pre-operation water supply step, after the pre-operation water supply step, and during the pre-operation water supply step, driving a heater module to generate steam in the sump and supplying the generated steam to a filter assembly to clean the filter assembly (a pre-cleaning steam generation and supply step), driving the drainage module to drain the wash water (a pre-cleaning drainage step) after the pre-cleaning steam generation and supply step, and washing dishes (a washing cycle) after the pre-cleaning drainage step.

[0027] There is also provided a method of controlling a dishwasher comprising a sump and filter assembly, the method comprising: generating steam from water in the sump; and supplying the steam to the filter assembly to self-clean the filter assembly during operation of the dishwasher.

20 **BRIEF DESCRIPTION OF THE DRAWINGS**

[0028] The above and other objects, features and other advantages will be more clearly understood from the following detailed description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a front sectional view schematically showing a dishwasher according to a first embodiment;

FIG. 2 is a front sectional view of a filter and a sump shown in FIG. 1;

FIG. 3 is a flowchart showing a control method of a dishwasher according to a first embodiment;

FIG. 4 is a flowchart showing a control method of a dishwasher according to a second embodiment;

FIG. 5 is a flowchart showing a control method of a dishwasher according to a third embodiment;

FIG. 6 is a flowchart showing a control method of a dishwasher according to a fourth embodiment; and

FIG. 7 is a flowchart showing a control method of a dishwasher according to a fifth embodiment.

DETAILED DESCRIPTION OF THE EMBODIMENTS

[0029] Advantages, features and methods for achieving those of embodiments may become apparent upon referring to embodiments described later in detail together with attached drawings. However, embodiments are not limited to the embodiments disclosed hereinafter, but may be embodied in different modes. The embodiments are provided for perfection of disclosure and informing a scope to persons skilled in this field of art. Like reference numbers may refer to the like elements throughout the specification.

[0030] FIG. 1 is a front sectional view schematically showing a dishwasher according to a first embodiment, and FIG. 2 is a front sectional view of a filter and a sump shown in FIG. 1.

[0031] Referring to the figures, the dishwasher accord-

ing to this embodiment includes a cabinet assembly 10 that defines the external appearance of the dishwasher, a rack 20 disposed in the cabinet assembly 10 to receive dishes, a spray module 30 disposed in the cabinet assembly 10 to spray wash water to the dishes, a sump 40 disposed in the cabinet assembly 10 to supply wash water to the spray module 30, a water supply module 50 configured to supply wash water to the sump 40 or the spray module 30, a drainage module 60 connected to the sump 40 to discharge wash water stored in the sump out of the dishwasher, a filter assembly 70 mounted in the sump 40 to filter the wash water, and a heater module 90 mounted in the sump 40 to heat the wash water.

[0032] The cabinet assembly 10 defines the external appearance of the dishwasher.

[0033] The cabinet assembly 10 includes a cabinet 12, a door 14 coupled to the cabinet 12 to open and close the cabinet 12, and a tub 16 mounted in the cabinet 12 such that the tub 16 contacts wash water or steam.

[0034] The cabinet 12 is open at the front thereof. The door 14 is mounted at the open front of the cabinet 12. The tub 16 is disposed in the cabinet 12. The tub 16 is also open at the front thereof. When the door 14 is closed, the door 14 closes the open front of the tub 16. The door 14 prevents wash water or steam from leaking out of the tub 16.

[0035] The rack 20 is mounted in the tub 16. Dishes are received in the rack 20.

[0036] The spray module 30 sprays wash water to the dishes. The spray module 30 includes spray nozzles 32 and nozzle channels 34 configured to supply wash water to the spray nozzles 32.

[0037] In this embodiment, three spray nozzles 32 are provided. In addition, three nozzle channels 34 are also provided such that the nozzle channels 34 correspond to the respective spray nozzles 32. A nozzle channel switching unit 36 is provided to selectively supply wash water to at least one of the nozzle channels 34.

[0038] In this embodiment, the spray module 30 is configured to receive wash water from the sump 40, which stores wash water, and to spray the received wash water. Unlike this embodiment, water may be directly supplied to the spray module 30 through the water supply module 50.

[0039] The water supply module 50 receives water from the outside and supplies the received water to the sump 40. In this embodiment, water from the water supply module 50 is supplied to the sump 40 via the filter assembly 70.

[0040] The drainage module 60 discharges wash water stored in the sump 40 out of the dishwasher. The drainage module 60 includes a drainage channel 62 and a drainage pump 64.

[0041] The filter assembly 70 filters foreign matter, such as food waste, from wash water. The filter assembly 70 is disposed in a wash water flow channel along which wash water flows from the tub 16 to the sump 40.

[0042] The sump 40 is provided with a filter installation

portion 42, at which the filter assembly 70 is installed. A filter channel 41 configured to connect the filter installation portion 42 to the interior of the sump 40 is disposed in the sump 40.

[0043] A sump storage unit 45 configured to store wash water is disposed in the sump 40.

[0044] A pump module 80 configured to feed wash water stored in the sump 40 to the spray module 30 is disposed in the sump 40.

[0045] The pump module 80 includes a pump motor 82 and an impeller 84 connected to the pump motor 82 such that the impeller 84 can be rotated by the pump motor 82. Wash water stored in the sump 40 is fed to the spray module 30 according to the rotation of the impeller 84.

[0046] In this embodiment, the pump module 80 is configured to move wash water using the impeller 84. Unlike this embodiment, the pump module 80 may be configured variously.

[0047] The pump module 80 is connected to the spray module 30 via a pump channel 81.

[0048] The sump 40 is connected to a steam channel 43 and a steam nozzle 44. The sump 40 sprays steam generated by the heater module 90 into the tub 16.

[0049] Although not shown, a valve configured to control steam may be mounted in the steam channel 43. Steam to be sprayed to the tub 16 may be controlled through the valve. According to the circumstances, the amount of steam to be sprayed may be adjusted by the valve.

[0050] Meanwhile, the steam generated in the sump 40 may be supplied into the tub 16 through the filter channel 41 and the filter installation portion 42 instead of the steam nozzle 44. The sump 40 may supply steam into the tub 16 in opposite directions. The sump 40 may be connected to the tub 16 through the steam channel 43 and the filter channel 41 in opposite directions.

[0051] The filter assembly 70 includes an outer filter 72 mounted in the filter installation portion 42 of the sump 40 and an inner filter 74 mounted in the outer filter 72 such that the inner filter 74 can be separated from the outer filter 72.

[0052] The inner filter 74 filters large-sized particles of foreign matter from the wash water, and the outer filter 72 filters small-sized particles of foreign matter from the wash water having passed through the inner filter 74.

[0053] The wash water filtered by the outer filter 72 may move to the sump storage unit 45 via the filter channel 41.

[0054] As the dishwasher is repeatedly used, micro particles of foreign matter or garbage may become attached to the inside of the outer filter 72. In a conventional dishwasher, foreign matter attached to the outer filter 72 is hardened after the drainage of wash water, with the result that the performance of the outer filter 72 is reduced.

[0055] In this embodiment, the performance of the outer filter 72 is appropriately maintained using control meth-

ods which will hereinafter be described.

[0056] The heater module 90 is mounted outside the sump 40. The heater module 90 mounted outside the sump 40 does not contact wash water.

[0057] The heater module 90 heats wash water in the sump storage unit 45. The heater module 90 may convert wash water in the sump storage unit 45 into steam using thermal conduction.

[0058] Meanwhile, an organic acid supply module 100, configured to supply an organic acid harmless to humans into the tub 16, may be further mounted in the cabinet assembly 10.

[0059] The organic acid supplied by the organic acid supply module 100 may remove scale deposited in the tub 16. The organic acid may sterilize the interior of the tub 16.

[0060] FIG. 3 is a flowchart showing a control method of a dishwasher according to a first embodiment.

[0061] The control method of the dishwasher according to this embodiment is performed when the dishwasher is initially driven.

[0062] The control method of the dishwasher according to this embodiment includes a pre-operation drainage step (S10) of driving the drainage module 60 to perform drainage before operating the dishwasher, a pre-operation water supply step (S20) of driving the water supply module 50 to supply wash water to the sump 40 before operating the dishwasher, a pre-cleaning steam generation and supply step (S30) of driving the heater module 90 to generate steam in the sump 40 and supplying the generated steam to the filter assembly 70 to clean the filter assembly 70, and a pre-cleaning drainage step (S40) of driving the drainage module 60 to drain the wash water in the tub 16 after the pre-cleaning steam generation and supply step (S30).

[0063] The control method is performed to remove foreign matter from the filter assembly 70 before a washing cycle (S50) for washing dishes. The control method is automatically performed even without manipulation on the part of a user. It is possible to remove foreign matter from the filter assembly 70 using the control method.

[0064] The pre-operation drainage step (S10) is not indispensable to the removal of foreign matter from the filter assembly 70. For this reason, the pre-operation drainage step (S10) may be omitted. When contaminated water is left in the sump 40 or the drainage module 60, the pre-operation drainage step (S10) is performed to remove the contaminated water from the sump 40 or the drainage module 60.

[0065] For example, when a user puts dishes in the rack 20 to dry the dishes, water remaining on the dishes may be stored in the tub 16. The pre-operation drainage step (S10) is performed to drain the water stored in the tub 16, thus preventing the interior of the tub 16 from being contaminated again.

[0066] The pre-operation water supply step (S20) is a step of supplying clean water to generate steam. At the pre-operation water supply step (S20), wash water is

supplied through the water supply module 50.

[0067] In this embodiment, the wash water is stored in the sump 40 through the filter assembly 70. As a result, the filter assembly 70 is wet by the wash water at the pre-operation water supply step (S20).

[0068] The pre-cleaning steam generation and supply step (S30) is a step of generating steam to clean the filter assembly 70. The generated steam is supplied to the filter assembly 70.

[0069] The steam generated in the sump 40 may be supplied into the tub 16 in opposite directions, as described above. Foreign matter attached to the filter assembly 70 may be soaked in the steam flowing to the filter assembly 70. The soaked foreign matter may be easily removed from the outer filter 72.

[0070] In order to more effectively remove the foreign matter from the filter assembly 70, the steam may be formed at high pressure. The pressure of the steam flowing from the sump 40 to the filter assembly 70 may be high.

[0071] In a case in which a valve is mounted in the steam channel 43, the valve in the steam channel 43 may be closed such that a larger amount of steam can be supplied to the filter assembly 70 through the filter channel 41.

[0072] The steam generated in the sump 40 is supplied to the filter assembly 70 through the filter channel 41 along the shortest distance. The loss of heat from the steam supplied through the filter channel 41 may be minimized.

[0073] The steam flows from the outside of the filter assembly 70 to the inside of the filter assembly 70. The foreign matter separated from the filter assembly by the steam flowing from the outside of the filter assembly 70 to the inside of the filter assembly 70 is stored in the filter assembly 70.

[0074] At the pre-cleaning drainage step (S40), the foreign matter separated from the outer filter 72 is discharged together with the wash water. The pre-cleaning drainage step (S40) is performed to discharge the foreign matter separated from the outer filter 72, thus preventing the dishes from being contaminated again.

[0075] After the pre-cleaning drainage step (S40), the washing cycle (S50) may be performed.

[0076] That is, the foreign matter separated from the filter assembly 70 is discharged before the washing cycle (S50).

[0077] The washing cycle (S50) is a procedure for washing the dishes using various methods. The washing cycle (S50) may include a series of processes, such as rinsing and drying. The washing cycle (S50) is well known to those skilled in the art to which the present disclosure pertains, and therefore a detailed description thereof will be omitted.

[0078] Steps S20 to S40 according to this embodiment are steps of self-cleaning the filter assembly 70 during the initial operation of the dishwasher.

[0079] In this embodiment, steps S20 to S40 are de-

fined as a pre-filter cleaning cycle (ST10).

[0080] In the pre-filter cleaning cycle (ST10), about one liter of wash water is supplied. In the pre-filter cleaning cycle (ST10), steam is generated for about 10 minutes to separate foreign matter from the filter assembly 70.

[0081] Since foreign matter firmly attached to the filter assembly 70 is removed in the pre-filter cleaning cycle (ST10), consistent washing force is provided in the washing cycle (S50).

[0082] In the pre-filter cleaning cycle (ST10), it is possible to prevent the outer filter 72 from being clogged due to foreign matter through self-cleaning. The pre-filter cleaning cycle (ST10) may make it less troublesome for the user to clean the filter assembly 70.

[0083] A controller of the dishwasher may periodically perform the pre-filter cleaning cycle (ST10). That is, the controller of the dishwasher may count the number of washing cycles (C10), and may control the pre-filter cleaning cycle (ST10) to be performed every predetermined number of times.

[0084] That is, the pre-filter cleaning cycle (ST10) may be performed whenever the dishwasher is initially operated, or may be performed periodically in a predetermined manner.

[0085] The pre-filter cleaning cycle (ST10) also has the effect of pre-heating the interior of the tub 16 before the washing cycle (S50) even though the pre-filter cleaning cycle (ST10) is a cycle of removing foreign matter from the filter assembly 70. In a case in which the tub 16 is pre-heated in the pre-filter cleaning cycle (ST10), the effect of washing the dishes is improved.

[0086] In addition, the pre-filter cleaning cycle (ST10) also has the effect of sterilizing the filter assembly 70 since steam is supplied to the filter assembly 70 before the washing cycle (S50).

[0087] In the pre-filter cleaning cycle (ST10), it is possible to remove odor-causing materials from the filter assembly 70. In a case in which odor-causing materials are removed from the filter assembly 70, it is possible to prevent the dishes from being contaminated by odors in the washing cycle (S50).

[0088] FIG. 4 is a flowchart showing a control method of a dishwasher according to a second embodiment.

[0089] The control method of the dishwasher according to this embodiment is similar to the control method of the dishwasher according to the first embodiment except that the filter assembly 70 is self-cleaned after the washing cycle (S50) and before the operation of the dishwasher is finished.

[0090] That is, the control method of the dishwasher according to this embodiment includes a post-cleaning water supply step (S60) of supplying wash water to the sump 40 after the washing cycle (S50) is completed and before the operation of the dishwasher is finished, a post-cleaning steam generation and supply step (S70) of heating the supplied wash water to generate steam and supplying the generated steam to the filter assembly 70 to separate foreign matter from the filter assembly 70, and

a post-cleaning drainage step (S80) of discharging the foreign matter separated from the filter assembly 70 together with wash water.

[0091] Steps S60 to S80 are defined as a post-filter cleaning cycle (ST20).

[0092] In the post-filter cleaning cycle (ST20), steam is supplied to the filter assembly 70, which has foreign matter attached thereto after the washing cycle (S50), such that the foreign matter can be more effectively separated from the filter assembly 70.

[0093] In this embodiment, both the pre-filter cleaning cycle (ST10) and the post-filter cleaning cycle (ST20) are performed. Unlike this embodiment, the post-filter cleaning cycle (ST20) may be performed after the washing cycle (S50) without performing the pre-filter cleaning cycle (ST10).

[0094] The other constructions of this embodiment are identical to those of the first embodiment, and therefore a detailed description thereof will be omitted.

[0095] FIG. 5 is a flowchart showing a control method of a dishwasher according to a third embodiment.

[0096] The control method of the dishwasher according to this embodiment is performed in a case in which a specific course is selected in order to remove scale in the tub 16.

[0097] The control method of the dishwasher according to this embodiment is similar to the control method of the dishwasher according to the first embodiment except that a scale removal cycle (ST30) of supplying an organic acid into the tub 16 to remove scale in the tub 16 is performed after the pre-cleaning steam generation and supply step (S30).

[0098] The control method of the dishwasher according to this embodiment includes a pre-operation drainage step (S10) of driving the drainage module 60 to perform drainage before operating the dishwasher, a pre-operation water supply step (S20) of driving the water supply module 50 to supply wash water to the sump 40 before operating the dishwasher, a pre-cleaning steam generation and supply step (S30) of driving the heater module 90 to generate steam in the sump 40 and supplying the generated steam to the filter assembly 70 to clean the filter assembly 70, and a scale removal cycle (ST30) of supplying an organic acid into the tub 16 to remove scale in the tub 16 after the pre-cleaning steam generation and supply step (S30).

[0099] For example, the specific course may be a filter cleaning course or a filter sterilizing course.

[0100] The scale is formed from hard water. Hard water is high-hardness water containing calcium ions and magnesium ions. When the amounts of calcium ions (Ca^{2+}) and magnesium ions (Mg^{2+}) contained in water are converted into calcium carbonate (CaCO_3), 1 mg/l corresponds to a hardness of 1.

[0101] Water having a hardness of 0 to 50 is soft water, water having a hardness of 50 to 100 is normal soft water, water having a hardness of 100 to 150 is slightly soft water, water having a hardness of 150 to 250 is normal

hard water, and water having a hardness of more than 250 is hard water. Hard water is generally found in limestone zones, inland basin lakes, and underground.

[0102] When water containing calcium ions and magnesium ions is repeatedly heated and used, scale resulting from a chemical reaction between the calcium ions and the magnesium ions is formed in the tub 16.

[0103] The organic acid reduces the scale. The organic acid reduces the scale to calcium ions and magnesium ions, thus eliminating the scale.

[0104] Any one selected from among citric acid, malic acid, tartaric acid, acetic acid, lactic acid, and formic acid, which are harmless to humans, is used as the organic acid. The reducing process, whereby the organic acid chemically react with the scale, is accelerated in a high temperature atmosphere.

[0105] The scale removal cycle (ST30) includes an organic acid supply step (S92) of supplying an organic acid into the tub 16, a rinsing step (S94) of supplying wash water into the tub 16 through the spray module 30, and a drying step (S96) of heating the interior of the tub 16 to dry the interior of the tub 16.

[0106] The organic acid reduces scale formed on the inside of the tub 16 into metal ions to remove the scale. At the rinsing step (S94), the supplied organic acid is circulated together with the wash water, and is then uniformly sprayed into the tub 16.

[0107] In this embodiment, the user may select a specific course in order to remove scale and to clean the filter, and cleaning of the filter and removal of the scale may be simultaneously performed using the organic acid.

[0108] The other constructions of this embodiment are identical to those of the first embodiment, and therefore a detailed description thereof will be omitted.

[0109] FIG. 6 is a flowchart showing a control method of a dishwasher according to a fourth embodiment.

[0110] In the control method of the dishwasher according to this embodiment, an organic acid is supplied to remove scale from the tub 16 in the pre-filter cleaning cycle (ST10) of the first embodiment.

[0111] The control method of the dishwasher according to this embodiment may further include an organic acid supply step (S92) of supplying an organic acid into the tub 16 at a time of at least one selected from among before supplying wash water, after supplying wash water, and while supplying wash water in the pre-filter cleaning cycle (ST10).

[0112] The organic acid may be automatically supplied during self-cleaning. It is possible to restrain scale from being formed in the tub 16 by performing the organic acid supply step (S92).

[0113] The other constructions of this embodiment are identical to those of the first embodiment, and therefore a detailed description thereof will be omitted.

[0114] FIG. 7 is a flowchart showing a control method of a dishwasher according to a fifth embodiment.

[0115] In the control method of the dishwasher according to this embodiment, an organic acid is supplied to

remove scale from the tub 16 in the post-filter cleaning cycle (ST20) of the second embodiment.

[0116] To this end, the control method of the dishwasher according to this embodiment may further include an organic acid supply step (S92) of supplying an organic acid into the tub 16 at a time of at least one selected from among before supplying wash water, after supplying wash water, and while supplying wash water in the post-filter cleaning cycle (ST20).

[0117] The organic acid may be automatically supplied during self-cleaning. It is possible to restrain scale from being formed in the tub 16 by performing the organic acid supply step (S92).

[0118] The other constructions of this embodiment are identical to those of the second embodiment, and therefore a detailed description thereof will be omitted.

[0119] As is apparent from the above description, the control method of the dishwasher according to the present disclosure has one or more of the following effects.

[0120] First, the control method of the dishwasher according to the present disclosure has the effect of supplying steam to the filter assembly before or after the washing cycle (S50) of washing the dishes, whereby it is possible to self-clean the filter assembly.

[0121] Second, the control method of the dishwasher according to the present disclosure has the effect of supplying steam to the filter assembly, whereby it is possible to separate foreign matter firmly attached to the filter assembly by soaking.

[0122] Third, the control method of the dishwasher according to the present disclosure has the effect of discharging the foreign matter separated from the filter assembly before the washing cycle (S50), whereby it is possible to prevent the dishes from being contaminated again by the foreign matter.

[0123] Fourth, the control method of the dishwasher according to the present disclosure has the effect of performing at least one of the pre-filter cleaning cycle (ST10) of self-cleaning the filter assembly and the post-filter cleaning cycle (ST20) of self-cleaning the filter assembly, whereby it is possible to provide consistent washing force in the washing cycle.

[0124] Fifth, the control method of the dishwasher according to the present disclosure has the effect of sterilizing or deodorizing the filter assembly using steam supplied during the removal of the foreign matter.

[0125] Sixth, the control method of the dishwasher according to the present disclosure has the effect of preventing the dishes from being contaminated by bacteria or odors in the washing cycle through sterilization or deodorization of the filter assembly.

[0126] Seventh, the control method of the dishwasher according to the disclosure has the effect of supplying an organic acid into the tub during self-cleaning of the filter assembly, whereby it is possible to easily remove scale from the inside of the tub.

[0127] It will be apparent that, although the preferred

embodiments have been shown and described above, the present disclosure is not limited to the above-described specific embodiments, and various modifications and variations can be made by those skilled in the art without departing from the scope of the appended claims. Thus, it is intended that the modifications and variations are possible.

Claims

1. A method of controlling operation of a dishwasher comprising a filter assembly (70), the method comprising the ordered steps of:

driving (S20) a water supply module (50) to supply water to a sump (40);
driving (S30) a heater module (90) to generate steam in the sump (40);
supplying the generated steam to the filter assembly (70) to clean the filter assembly; and
driving (S40) a drainage module (60) to drain water.

2. The method according to claim 1, further comprising the step of driving (S10) the drainage module (60) to drain the wash water stored in the sump (40) before the ordered steps of claim 1.

3. The method according to claim 1 or 2, wherein the ordered steps of claim 1 are performed periodically.

4. The method according to claim 3 wherein the ordered steps of claim 1 are performed every predetermined number of washing cycles.

5. The method according to any preceding claim, further comprising the step of supplying (S92) an organic acid into a tub (16) through an organic acid module at a time of at least one selected from the group comprising:

before the step of driving (S20) the water supply module (50) to supply water to the sump (40);
after the step of driving (S20) the water supply module to supply water to the sump; and
during the step of driving (S20) the water supply module to supply water to the sump.

6. The method according to any preceding claim, further comprising the step of determining (C10) a number of times that dishes have been washed before the step of driving (S20) the water supply module (50) to supply water to the sump (40).

7. The method according to any preceding claim, wherein the operation further comprises performing a washing cycle (S50).

8. The method of claim 7 wherein the operation comprises the ordered steps of claim 1 being performed before the washing cycle (S50).

9. The method of claim 7 wherein the operation comprises the ordered steps of claim 1 being performed after the washing cycle (S50).

10. The method of claim 7 wherein the operation comprises the ordered steps of claim 1 being performed before and after the washing cycle (S50).

11. The method of claim 8, 9 or 10 followed by the step of finishing operation of the dishwasher.

12. The method of claim 5 further comprising:

spraying water stored in the sump (40) into the tub (16) through a spray module (30); and
heating an interior of the tub (16) to dry the interior of the tub.

FIG. 1

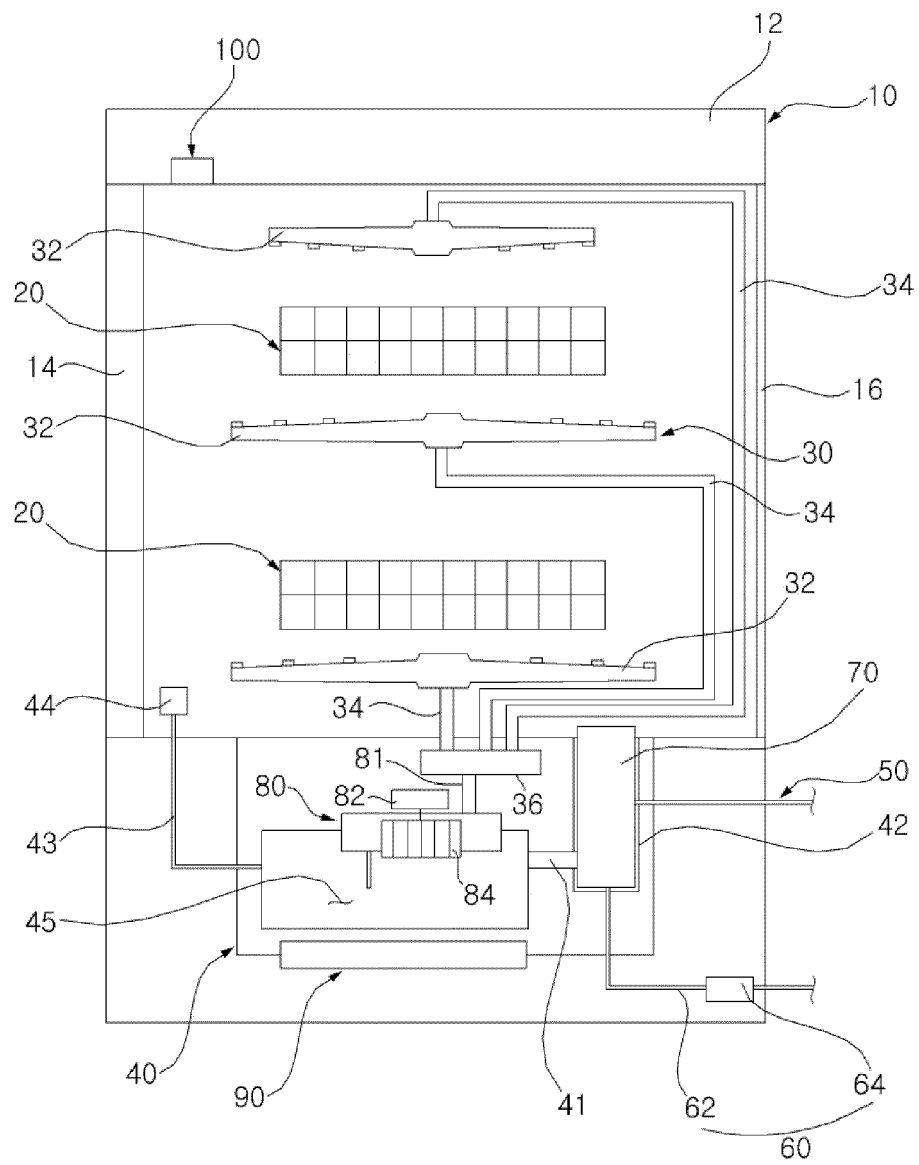


FIG. 2

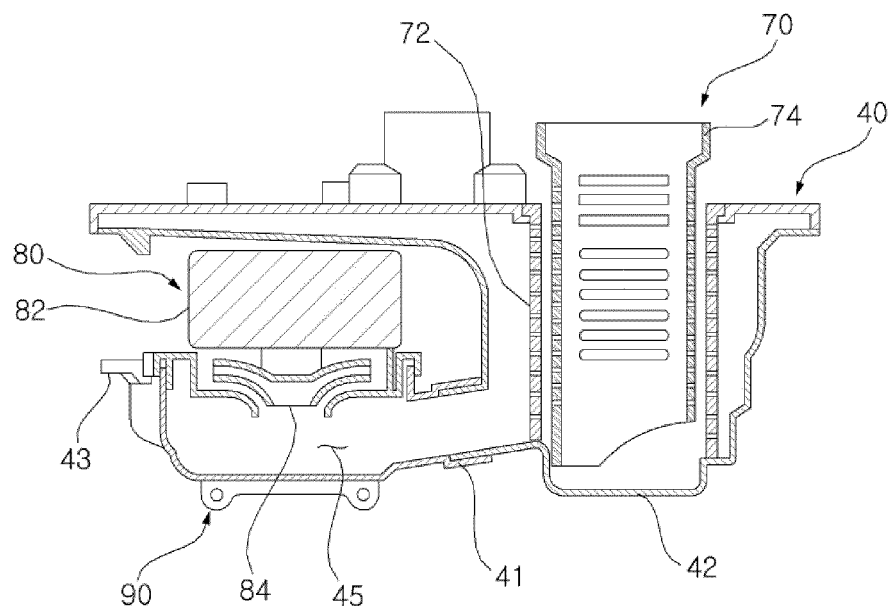


FIG. 3

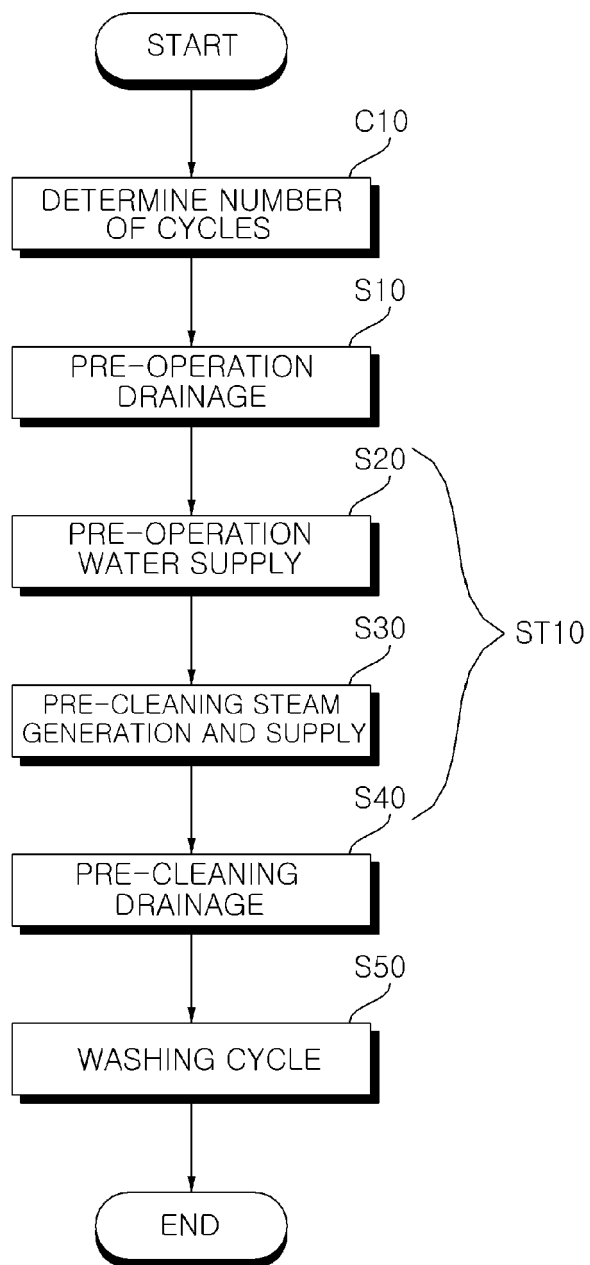


FIG. 4

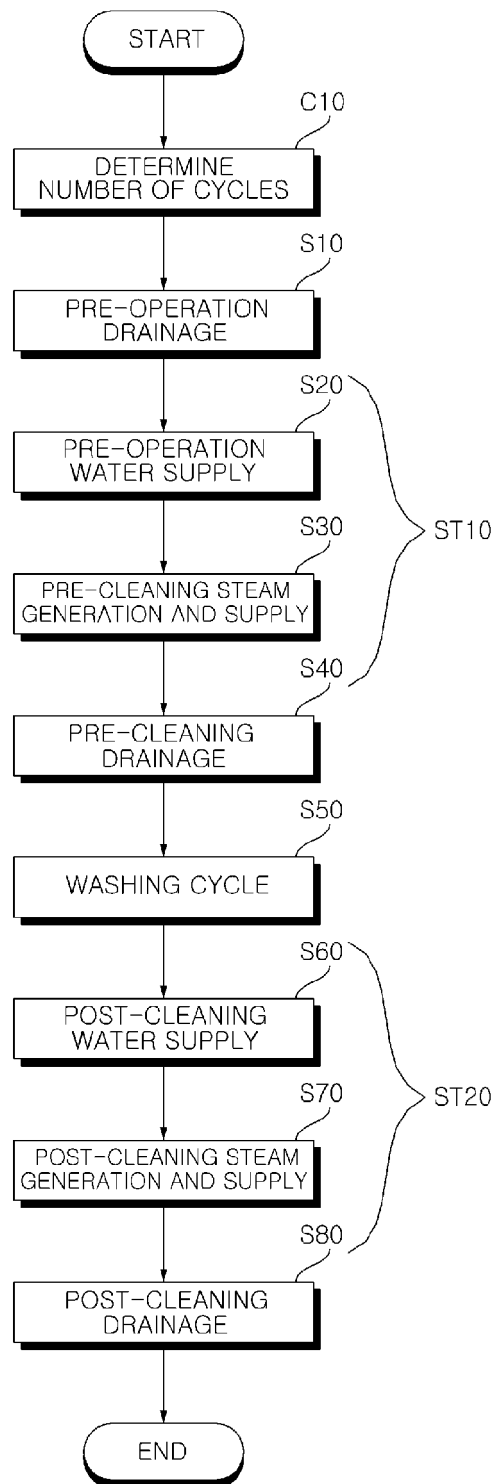


FIG. 5

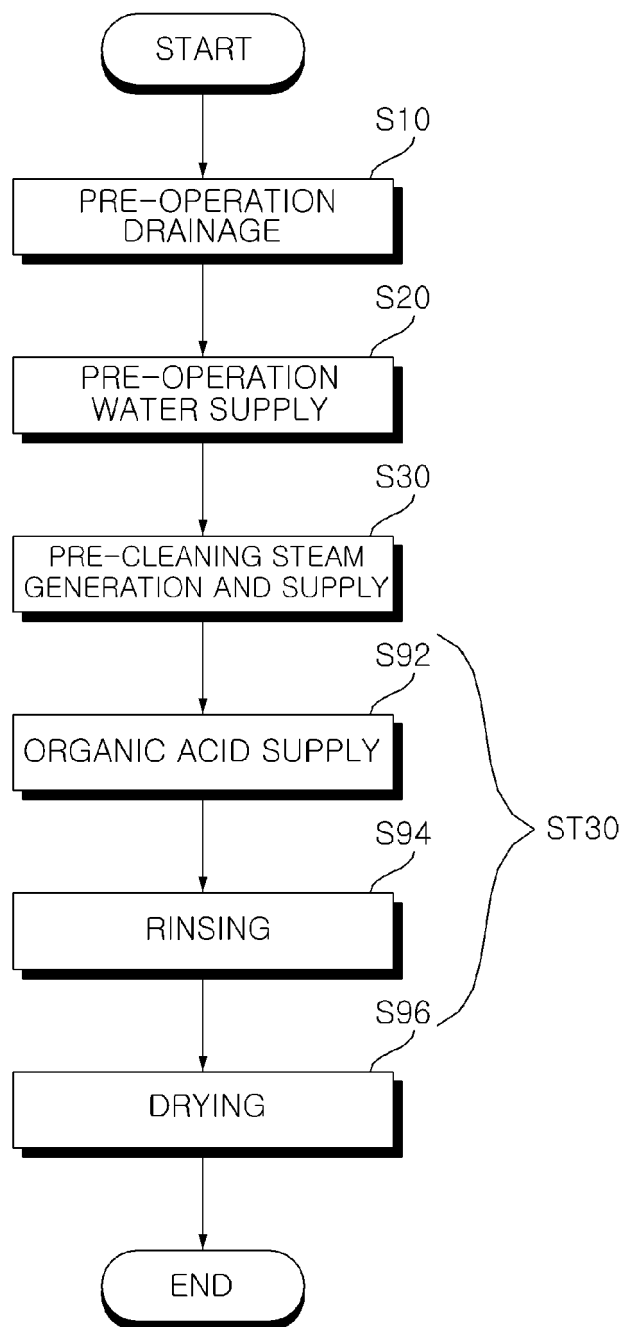


FIG. 6

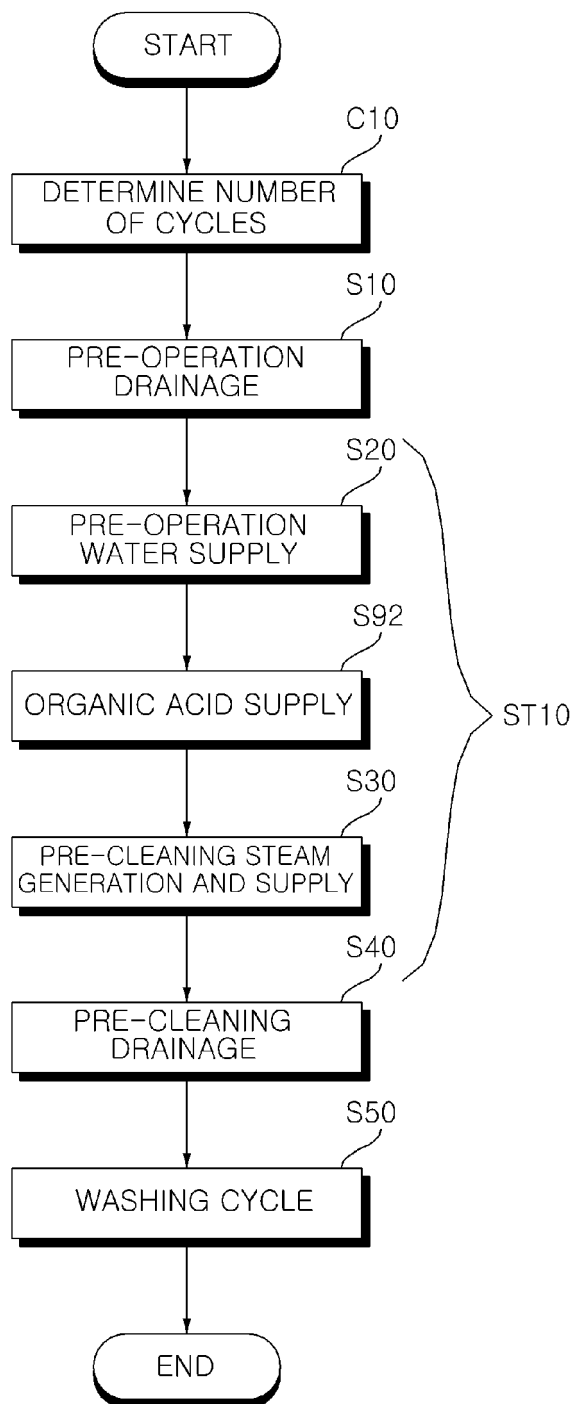
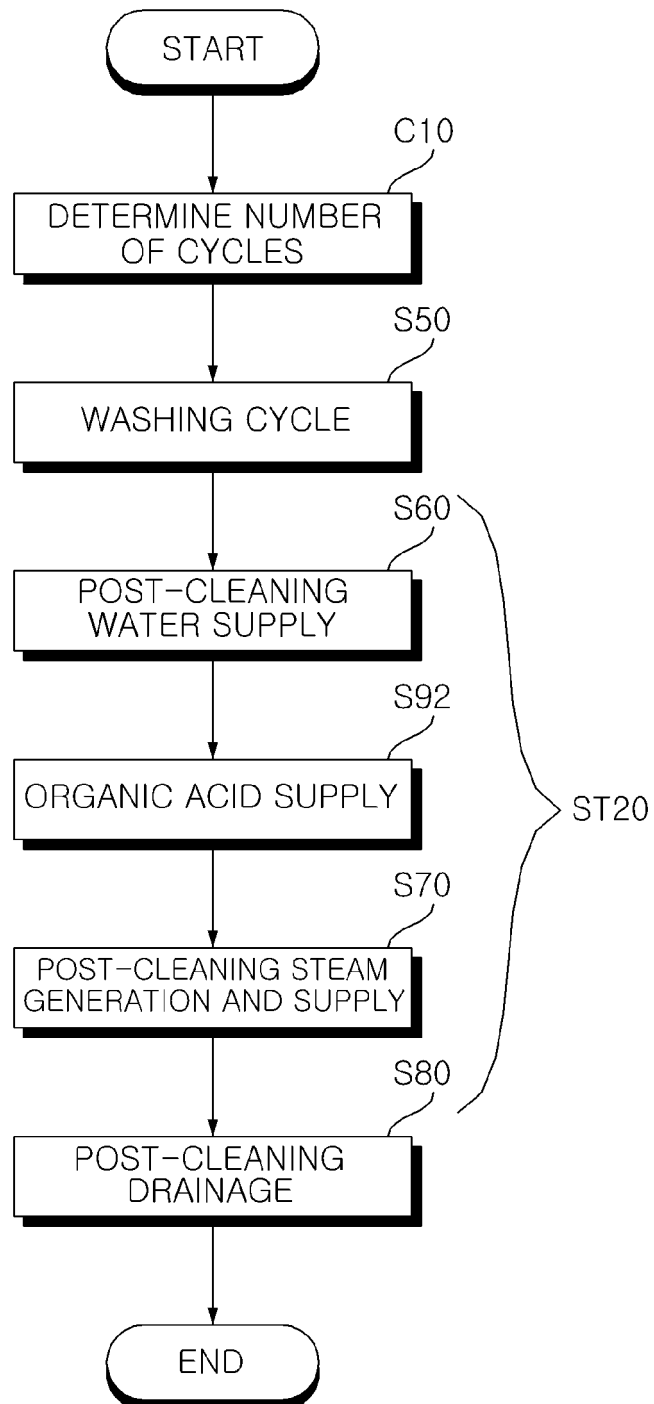


FIG. 7





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