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(72) Inventors:  
• **Lee, Jongmin**  
**153-023 Seoul (KR)**  
• **Lee Taehee**  
**153-023 Seoul (KR)**

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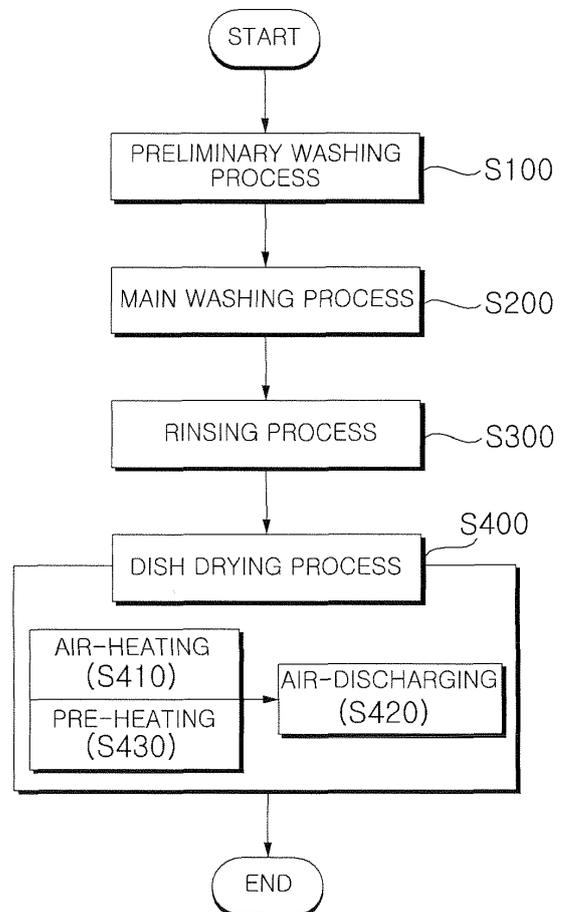
(74) Representative: **Vossius & Partner**  
**Siebertstrasse 4**  
**81675 München (DE)**

(71) Applicant: **LG Electronics, Inc.**  
**Seoul 150-721 (KR)**

(54) **Control method for dish washer**

(57) A control method for a dish washer according to the present invention includes air-heating for heating air in a tub after a main washing process of washing dishes in the tub, and air-discharging for discharging the air containing a moisture in the tub into an outside, during the air-heating or at the same time as the air-heating, such that energy efficiency can be increased and time required for a dish drying process can be shorten.

FIG. 3



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**Description****CROSS-REFERENCE TO RELATED APPLICATIONS**

[0001] This application claims the benefit of Korean Patent Application No. 10-2011-0137518, filed on December 19, 2011, in the Korean Intellectual Property Office, the entire disclosure of which is incorporated by reference herein for all purposes.

**BACKGROUND OF THE INVENTION****Technical Field**

[0002] The document relates to a control method for a dish washer, and in particular to a control method for a dish washer capable of increasing energy efficiency, while temporally shortening a dish drying process by heating air in a tub.

**Discussion of the Related Art**

[0003] In general, a dish washer is referred to as a washing apparatus, which apparatus washes foreign materials such as slops attached to dishes by spraying washing water into an inside of a tub using a high pressure.

[0004] In order to increase washing efficiency, such dish washer is configured to perform heating washing water first and dissolving detergent in water more easily. In addition, the dish washer is configured to be smoothly washed by soaking slops attached to dishes for a long time by washing water of a high temperature.

[0005] In a method of driving a dish washer, a washing cycle may be separated by a preliminary washing process, and a main washing process and a dish drying process. In the preliminary washing process, the dish washing can be performed more reliably by soaking slops attached to dishes. In recent years, a sterilization process that irradiates the ultraviolet light to suppress growth of bacteria has been added.

[0006] Here, in the dish drying process, two methods may be offered. The one of two methods may be a circulating drying method, in which the dishes in the tub is heated, the moisture is vaporized by evaporating the moisture from the dishes, the vaporized air in the tub is condensed by circulating it in the dish washer, and then the condensed water is discharged to the outside to dry the dishes. In addition, the other one may be a discharge drying method, in which dry air is introduced into the tub from the outside of the dish washer, the steam vaporized from the dishes heated such as the circulating drying method is included in the dry air and then, humid air containing the moisture is discharged to the outside to dry the dishes.

[0007] However, in the control methods of the prior art constructed as described above, the circulating drying method has a problem with efficiency lower than the dis-

charge drying method in terms of performance of the dishes.

[0008] On the other hand, in the control methods of the dish washer of the prior art, the discharge drying method is configured such that the washing water within the sump is typically heated up to a predetermined temperature in a rinsing process that rinses the washed dishes after the main washing process and the dish temperature in the tub is increased, in order to induce the evaporation of water. Accordingly, since the dish drying process is longer by a predetermined heating time of the washing water, and in heating at least the washing water, the washing water is heated up to a temperature suitable for washing the dishes and improvable for the dryness performance as described above, there is a severe problem of energy consumption.

**SUMMARY OF THE INVENTION**

[0009] In the light of this problem, the present invention has been made in an effort to provide a control method for a dish washer capable of increasing energy efficiency during a dish drying process, while shortening a dish drying time and improving entire drying performance.

[0010] According to an exemplary embodiment of the present invention, a control method for a dish washer may include air-heating for heating air in a tub after a main washing process of washing dishes in the tub, and air-discharging for discharging the air containing a moisture in the tub into an outside, during the air-heating or at the same time as the air-heating.

[0011] Here, the control method may include further pre-heating for heating washing water accommodated in a sump to increase a temperature of the dishes, after the main washing process and before the air-heating.

[0012] In addition, the temperature (a first set temperature) of the dishes increased through the air heated in the air-heating may be higher than that (a second set temperature) of the dishes increased in the pre-heating.

[0013] A control method for a dish washer according to the present invention may include a preliminary washing process, after heating washing water accommodated in a sump by a washing water heater, for soaking slops attached to dishes by spraying heated washing water onto dishes in a tub, a main washing process for spraying the washing water onto the dishes having soaked slops using a high pressure after the preliminary washing process, and a dish drying process for drying the dishes in the tub after the main washing process, wherein the dish drying process includes air-heating for heating air in the tub, and air-discharging for discharging the air containing a moisture in the tub into an outside, after the air-heating.

[0014] Here, the air-heating may increase a temperature of the dishes using an air heating heater installed in the tub.

[0015] In addition, the air-heating may heat the air such that the temperature of the dishes is increased up to a first set temperature.

[0016] In addition, the dish drying process may further include pre-heating for heating the washing water accommodated in the sump such that the temperature of the dishes is increased up to a second set temperature, after the main washing process and before the air-heating.

[0017] In addition, the first set temperature may be higher than the second set temperature.

[0018] In addition, the air-discharging may discharge the air in the tub containing water vapor into the outside by driving an exhaust fan.

[0019] In addition, the air heating heater may be disposed on a location where the dishes in the tub can be heated for heat radiation.

[0020] The features and advantages described in this summary and the following detailed description are not intended to be limiting. Many additional features and advantages will be apparent to one of ordinary skill in the art in view of the drawings, specification and claims.

### **BRIEF DESCRIPTION OF THE DRAWINGS**

#### **[0021]**

FIG. 1 is a side cross-sectional view illustrating a dish washer to which a control method for a dish washer according to an exemplary embodiment of the present invention is applied;

FIG. 2 is a graph illustrating an operation effect of a control method for a dish washer according to an exemplary embodiment of the present invention; and

FIG. 3 is a flow chart illustrating a control method for a dish washer according to an exemplary embodiment of the present invention.

### **DETAILED DESCRIPTION OF THE EMBODIMENTS**

[0022] The invention will be described more fully hereinafter with reference to the accompanying drawings, in which example embodiments of the inventions are shown. This invention may, however, be embodied in many different forms and should not be construed as limited to the embodiments set forth herein. Like reference numerals designate like elements throughout the specification. In the following description, if it is decided that the detailed description of known function or configuration related to the invention makes the subject matter of the invention unclear, the detailed description is omitted.

[0023] Hereinafter, a control method for a dish washer in accordance with an exemplary embodiment of the present invention will be described in detail with reference to the accompanying drawings.

[0024] FIG. 1 is a side cross-sectional view illustrating a dish washer to which a control method for a dish washer according to an exemplary embodiment of the present

invention is applied.

[0025] The dish washer to which the control method for the dish washer according to an exemplary embodiment of the present invention is applied may include a cabinet 10 forming an appearance, a door 100 for opening and closing an opening portion formed in the cabinet 10, a tub 200 formed in an inside of the cabinet 10 to store dishes and forming a receiving space for washing the dishes through a washing process, and a sump assembly 400 including various parts coupled to a lower side of the tub 200 to store washing water, to spray the washing water onto the dishes and to dry the dishes, as shown in FIG. 1.

[0026] A washing chamber 210 for accommodating the dishes is provided in an inside of the tub 200, and the washing chamber 210 is provided with a plurality of racks 220 to place the dishes. The rack 220 may include an upper rack 222 installed on an upper side of the washing chamber 210 and a lower rack 224 installed on a lower side of the washing chamber 210. The dishes are washed by spraying the washing water through a spray arm 230 in a state where the dishes are received in the rack 220.

[0027] The spray arm 230 is made of an upper arm 232 disposed on a lower side of the upper rack 222 and a lower arm 234 disposed on a lower side of the lower rack 224. Each of the upper arm 232 and the lower arm 234 is rotatably installed, and the spray arm 230 is provided with a plurality of spray nozzles to spray the washing water onto the dishes.

[0028] The sump assembly 400 is connected to the upper arm 232 and the lower arm 234 by a connection pipe 300. The sump assembly 400 may store the washing water and supply the washing water selectively or simultaneously to the upper arm 232 and the lower arm 234 through the connection pipe 300.

[0029] The sump assembly 400 may include a sump to store the washing water supplied through a water supply pipe 500 connected to an external water source, a drain chamber (not shown) inserted with a drain filter (not shown) that filters foreign materials from the washing water drained after washing the dishes, a drain pump (not shown) draining the washing water and the like. If washing of the dishes is finished, the washing water is pumped by the drain pump and drained to an outside of the dish washer through a drain pipe 600.

[0030] Meanwhile, even if the sump assembly 400 is not shown in the drawing, in order to increase an efficiency of washing of the dishes, it may further include a sump heater to increase a temperature of the washing water by directly applying heat to the washing water.

[0031] The sump heater can increase the washing water included in the sump assembly 400 up to a temperature suitable for washing the dishes. In particular, as a temperature of the washing water is higher, it is suitable for soaking slops attached to dishes for a long time and difficult to remove it. However, the high temperature of the washing water is not necessary, but there is needed to be increased up to a temperature with an appropriate

level by considering durability for heat of parts that makes up the sump assembly 400.

**[0032]** On the other hand, one side of the cabinet 10 is provided with an internal air discharging unit (not numeral undeclared) to discharge air in the tub 200 into the outside, such that the outside of the dish washer 1 and the inside of the washing chamber 210 are communicated with each other. The internal air discharging unit may be provided such that the air is discharged to the outside of the cabinet 10 by driving an exhaust fan (not shown).

**[0033]** Meanwhile, the dish washer 1 to which the control method for the dish washer according to an exemplary embodiment of the present invention is applied may include air heating heaters 700A and 700B that is disposed on at least any one portion of the inside of the washing chamber 210 to heat the internal air of the washing chamber 210, as shown in FIG. 1.

**[0034]** The air heating heaters 700A and 700B may be disposed on a middle part of any one wall side of the left and right of the washing chamber 210, as shown in FIG. 1, in order to heat for heat radiation of dishes received in the upper rack 222 and the lower rack 224. However, it is not necessary to be disposed on a location where the air heating heaters 700A and 700B can be heated for heat radiation of the dishes. Accordingly, the air heating heaters 700A and 700B may be disposed on a proper location suitable to be increased up to a predetermined temperature that can increase the temperature of the dishes by the convection phenomena in the washing chamber 210 of the heated air by considering caloric values of the air heating heaters 700A and 700B and the air flow by driving an exhaust fan in the tub 200.

**[0035]** In a preferred embodiment of the present invention, specifically, an upper air heater 700a may be provided on a location corresponding to an upper one side of the upper rack 222, and a lower air heater 700B may be provided on a middle part between the upper rack 222 and the lower rack 224, that is, a location corresponding to an upper one side of the lower rack 224.

**[0036]** The operation process of the dish washer 1 constructed as described above according to the embodiment of the present invention will be briefly described as follow.

**[0037]** First, after a user stores the dishes to be washed onto the upper rack 222 and the lower rack 224, when the dish washer 1 is activated by an operation button (not shown), the sump heater heats the washing water to a temperature suitable to wash for the dishes, and then the washing water of the high temperature is sprayed onto the dishes through the upper arm 232 or/and the lower arm 234. At this time, the washing water sprayed through the upper arm 232 or/and the lower arm 234 is preferably sprayed onto the dishes with a high pressure (Hereinafter, a process spraying with the high pressure using the upper arm 232 or/and the lower arm 234 is referred to as 'main washing process' S200).

**[0038]** However, before the main washing process S200, a preliminary washing process S100 may be per-

formed that sprays the washing water of the high temperature onto the dishes with a low pressure in order to appropriately soak slops attached to the dishes for a long time and difficult to remove it by spraying the washing water once.

**[0039]** Next, when the main washing process S200 has been terminated, after performing a rinsing process S300 that removes foreign materials such as slops attached to the dishes, if a dish drying process is finally performed that removes the remaining moisture in the dishes and then, the operation of the dish washer 1 is completed.

**[0040]** Hereinafter, according to a preferred embodiment of the present invention, a control method for the dish washer 1 constructed as described above will be described in detail.

**[0041]** FIG. 2 is a graph illustrating an operation effect of a control method for the dish washer according to the present invention, and FIG. 3 is a flow chart illustrating a control method for a dish washer according to the present invention.

**[0042]** In the preferred embodiment (1) of a control method for the dish washer according to the present invention, as shown in FIG. 3, after performing the main washing process S200 that washes the dishes in the tub, the control method may include air-heating S410 for heating air in a tub, and air-discharging S420 for discharging the air containing a moisture in the tub into an outside, during the air-heating.

**[0043]** Here, the main washing process S200 is referred to as a process spraying the washing water onto the dishes with the high pressure using the upper arm 232 or/and the lower arm 234, and before the main washing process S200, after the washing water accommodated in the sump is heated by the sump heater, a preliminary washing process S100 may be performed that sprays the heated washing water onto the dishes in the tub 200 and soaks slops attached to the dishes, as described above.

**[0044]** In addition, after the main washing process S200, the rinsing process S300 may be performed as described above.

**[0045]** Meanwhile, the above-mentioned air-heating S410 and air-discharging S420 performed after the main washing process S200 are processes that perform for the drying of the dishes. Accordingly, hereinafter, they are collectively referred to as "dish drying process S400."

**[0046]** The air heating S410 in the dish drying process S400 is a step of heating air in the tub 200 using the air heating heaters 700A and 700B disposed in the washing chamber 210 of the tub 200. The air in the washing chamber 210 is heated that means the dryness of the air is increased instantaneously, and may contain more moisture than air of the high temperature. They are already a well-known. Reasons to heat the air in the washing chamber 210 through the air heating S410 are to increase the temperature of the dishes and to vaporize the remaining moisture in the dishes by directly heating the air and to increase content of the moisture that may be contained

in the air by indirectly increasing the dryness of the air.

**[0047]** However, a method of increasing the temperature of the dishes is not limited to the above-mentioned air-heating S410. That is, it is possible to increase an entire internal temperature of the washing chamber 210 by heating the washing water accommodated in the sump using the sump heater before the air heating S410 or at the same time as the air heating S410. For the convenience of description, it is referred to as "pre-heating S430."

**[0048]** The temperature of washing water heated by the pre-heating S430 is preferably set to at least proper temperature for washing the dishes (that is, the main washing process S200).

**[0049]** In a method of the prior art, the temperature of the dishes can be increased under a discharge type drying way tub 200 that dries the dishes by discharging the air containing a moisture in the tub into an outside. Accordingly, the temperature of the dishes has been increased through only the above-mentioned pre-heating S430. However, in the dish temperature increasing method in the prior art, energy consumption is extreme since water that has relatively large specific heat is to be heated, and a temperature has to be set to satisfy the conditions for improving the drying performance of the dishes, rather than the heating temperature of the washing water or at least optimum temperature for washing the dishes. Accordingly, there is a problem in that execution time in the overall dish drying process is long, since the heating time of the washing water is long and the heating temperature of the washing water is increased.

**[0050]** In order to overcome this problem, in the control method of the dish water 1 according to the present invention, the air in the washing chamber 210 that has a specific heat that is relatively small and can be heated in a short time is directly heated by air heating S410.

**[0051]** In particular, by means of the air heating heater 700A and 700B, the temperature of the dishes can be quickly increased, the moisture can be vaporized, and the air containing the moisture can be discharged to the outside through the discharge type drying way, by setting locations of the air heating heaters 700A and 700B such that the air is heated and the dishes are heated for heat radiation.

**[0052]** At this time, the dishes heated by the air heating S410 is increased up to at least the first set temperature that is added by a predetermined temperature from the increasing temperature (second set temperature) by heating the washing water of the sump heater. In other words, this means that the first set temperature of the dishes increased by the air heated in the air heating S410 is higher than the second set temperature of the dishes increased in the pre-heating S430. This is because that, if the air in the washing chamber 210 is heated using the air heating heaters 700A and 700B, by means of the convection of heated air within the washing chamber 210, the temperature of the dishes received in the upper rack 222 and the lower rack 224 is increased by heat conduc-

tion of the convection, or the temperature is directly increased by the higher temperature due to the heating of the radiation through the air heating heaters 700A and 700B.

**[0053]** With reference to FIG. 2, it will be described in detail. When the same energy is consumed, in case the heating of the washing water of the sump heater is used, it is known that the temperature of the dishes is maintained at the higher temperature in the dish drying process when the washing water and the air are simultaneously heated using both the temperature changes of the dishes and the sump heater and the air heating heaters 700A and 700B. This is given a hint that the water is easily vaporized since the moisture in the dishes is evaporated.

**[0054]** The air-discharging S420 is a step of discharging the air in the tub 200 containing water vapor into the outside by driving an exhaust fan.

**[0055]** Thus, in the control method of the dish washer 1 according to the present invention, the discharging drying way having the higher drying performance is adopted, rather than the circulating drying method of the dish drying methods in the prior art, there is an advantage in that time required for the dish drying process can be greatly reduced, since the moisture contained in the dishes can be vaporized while increasing the temperature of the dishes in a shorter time, and the dryness of the air can be increased.

**[0056]** Therefore, the control method for the dish washer according to the present invention has the effect that can reduce energy consumption, compared to the increasing temperature of the dishes using the washing water, by quickly increasing the temperature of the dishes by heating air in the tub during the dish drying process.

**[0057]** In addition, control method for the dish washer according to the present invention has the effect in that time required for the dish drying process can be reduced and the dish drying can be quickly achieved, since the air in the tub is heated and the temperature of dishes is quickly increased.

**[0058]** As above, the preferred embodiment of the control method of the dish washer according to the present invention has been described with reference to the accompanying drawings. However, the preferred embodiment is not to be construed as limiting thereof. Those skilled in the art will readily appreciate that many modifications are possible in embodiments without materially departing from the novel teachings and advantages. Accordingly, all such modifications are intended to be included within the scope of this inventive concept as defined in the claims.

## Claims

1. A control method for a dish washer, comprising:
  - (a) air-heating for heating air in a tub after a main

- washing process of washing dishes in the tub;  
and  
(b) air-discharging for discharging the air containing moisture in the tub into an outside
- 5
2. The control method according to claim 1 wherein step (b) is performed during the air-heating or at the same time as the air-heating
3. The control method according to claim 1 or 2, further comprising:
- 10 pre-heating for heating washing water accommodated in a sump to increase a temperature of the dishes, after the main washing process and before the air-heating.
- 15
4. The control method according to claim 3, wherein the temperature of the dishes (hereafter, referred to as a first set temperature) increased through the air heated in the air-heating is higher than that of the dishes (hereafter, referred to as a second set temperature) increased in the pre-heating.
- 20
5. A control method according to claim 1, comprising:
- 25 a preliminary washing process, after heating washing water accommodated in a sump by a washing water heater, for soaking slops attached to dishes by spraying heated washing water onto dishes in a tub;  
a main washing process for spraying the washing water onto the dishes having soaked slops using a high pressure after the preliminary washing process; and  
a dish drying process for drying the dishes in the tub after the main washing process, wherein the dish drying process includes:
- 30 the air-heating step (a) for heating air in the tub, and  
the air-discharging step (b) for discharging the air containing moisture in the tub into an outside, after the air-heating.
- 35
6. The control method according to claim 5, wherein the air-heating increases a temperature of the dishes using an air heating heater installed in the tub.
- 40
7. The control method according to claim 5 or 6, wherein  
the air-heating heats the air such that the temperature of the dishes is increased up to a first set temperature.
- 45
8. The control method according to claim 5, 6 or 7, wherein  
the dish drying process further includes pre-heating
- for heating the washing water accommodated in the sump such that the temperature of the dishes is increased up to a second set temperature, after the main washing process and before the air-heating.
9. The control method according to claim 8, wherein the first set temperature is higher than the second set temperature.
10. The control method according to any one of claims 1 to 9, wherein  
the air-discharging discharges the air in the tub containing water vapor into the outside by driving an exhaust fan.
11. The control method according to any one of claims 6 to 10, wherein  
the air heating heater is disposed on a location where the dishes in the tub can be heated for heat radiation.
12. The control method according to any one of claims 7 to 11, wherein  
a washing chamber for accommodating the dishes is provided in an inside of the tub, an upper rack is installed on an upper side such that the dishes is placed on the washing chamber, and a lower rack is installed on a lower side of the washing chamber, the air-heating heater includes:
- an upper air heater provided on an upper one side of the upper rack; and  
a lower air heater provided on an upper one side of the lower rack corresponding to a middle part between the upper rack and the lower rack.
13. The control method according to claim 12, wherein the air heating heater is disposed on a location where the dishes is increased up to the first set temperature by considering a caloric value and an air flow by a driving fan that flows the air into the tub.

FIG. 1

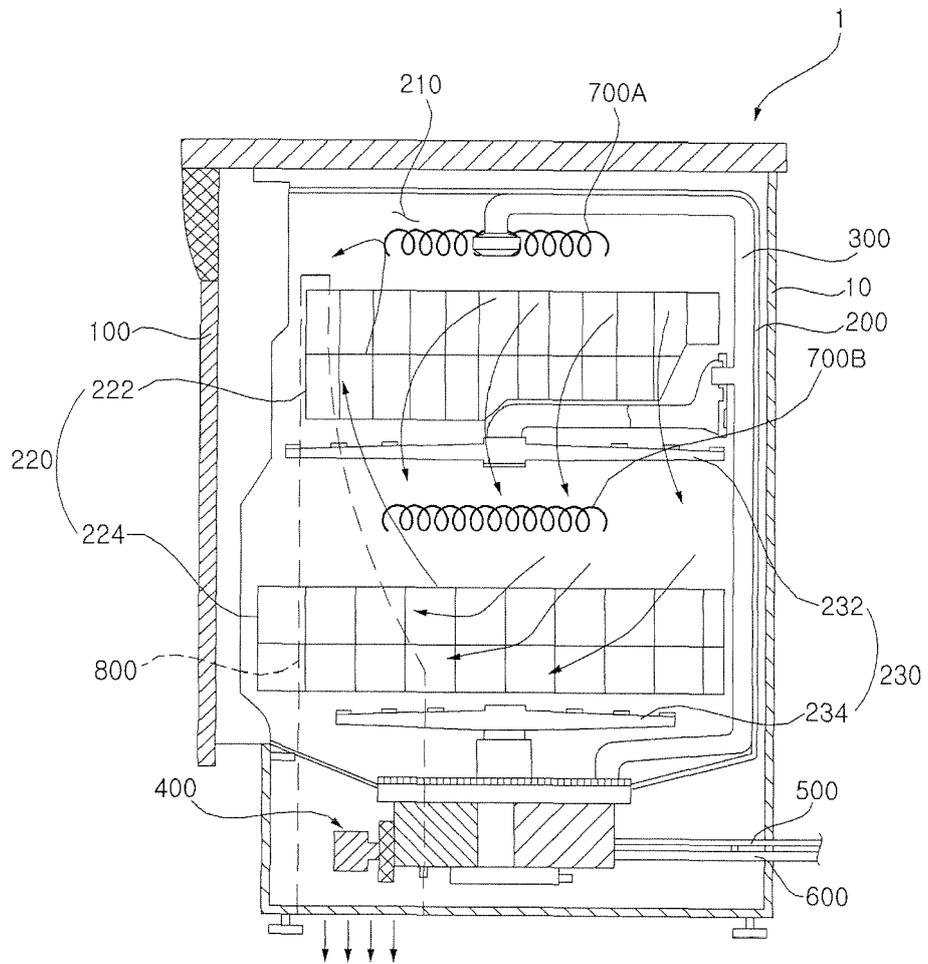


FIG. 2

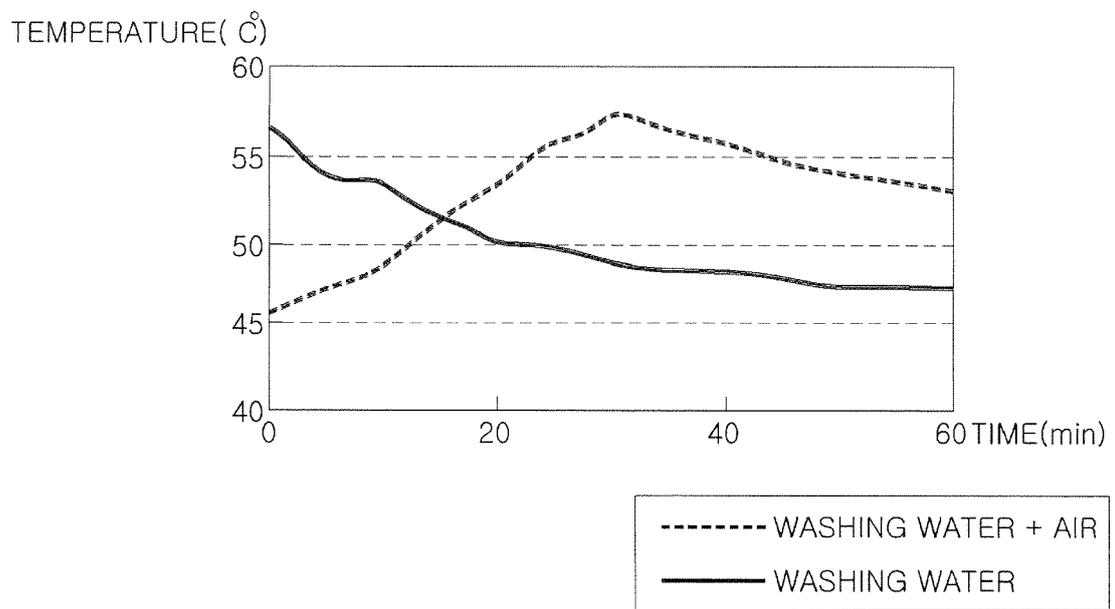
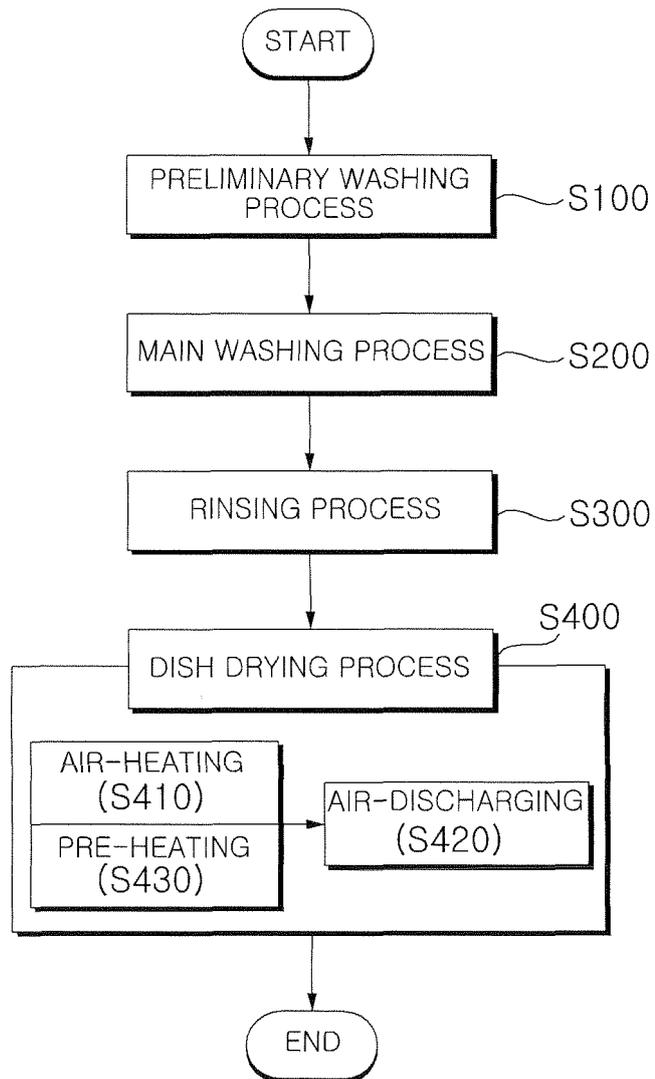


FIG. 3





EUROPEAN SEARCH REPORT

Application Number  
EP 12 19 7734

DOCUMENTS CONSIDERED TO BE RELEVANT			
Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (IPC)
X	WO 2009/008828 A1 (ASKO CYLINDA AB [SE]; PERSSON THOMAS [SE]; KARLSSON KENT [SE]) 15 January 2009 (2009-01-15)	1,2,10	INV. A47L15/00 A47L15/48
Y	* the whole document *	3-9, 11-13	
X	EP 1 721 559 A1 (ELECTROLUX HOME PROD CORP [BE]) 15 November 2006 (2006-11-15)	1,2,10	
Y	* column 2, paragraph 11 - column 4, paragraph 28; figures 1,2 *	3-9, 11-13	
Y	DE 22 32 119 A1 (LICENTIA GMBH) 17 January 1974 (1974-01-17)	3,4,6-9, 11-13	
Y	US 3 635 229 A (JACOBS JAMES W) 18 January 1972 (1972-01-18)	3,4,6-9, 11-13	
Y	DE 10 2009 031433 A1 (HENKEL AG & CO KGAA [DE]) 5 January 2011 (2011-01-05)	5	TECHNICAL FIELDS SEARCHED (IPC)
			A47L
The present search report has been drawn up for all claims			
Place of search		Date of completion of the search	Examiner
Munich		15 April 2013	Lodato, Alessandra
CATEGORY OF CITED DOCUMENTS			
X : particularly relevant if taken alone		T : theory or principle underlying the invention	
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P : intermediate document		& : member of the same patent family, corresponding document	

1  
EPO FORM 1503 03.82 (P04C01)

ANNEX TO THE EUROPEAN SEARCH REPORT  
ON EUROPEAN PATENT APPLICATION NO.

EP 12 19 7734

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15-04-2013

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2009008828 A1	15-01-2009	EP 2173229 A1	14-04-2010
		SE 0701646 A	10-01-2009
		WO 2009008828 A1	15-01-2009
-----			
EP 1721559 A1	15-11-2006	AT 501664 T	15-04-2011
		AU 2006245848 A1	16-11-2006
		AU 2010257430 A1	20-01-2011
		CA 2607801 A1	16-11-2006
		CN 101175432 A	07-05-2008
		EP 1721559 A1	15-11-2006
		EP 2332457 A1	15-06-2011
		KR 20080005249 A	10-01-2008
		RU 2374979 C2	10-12-2009
		US 2010139714 A1	10-06-2010
		WO 2006120062 A1	16-11-2006
-----			
DE 2232119 A1	17-01-1974	NONE	
-----			
US 3635229 A	18-01-1972	NONE	
-----			
DE 102009031433 A1	05-01-2011	CN 102469908 A	23-05-2012
		DE 102009031433 A1	05-01-2011
		EP 2391258 A1	07-12-2011
		KR 20120057609 A	05-06-2012
		US 2012090638 A1	19-04-2012
		WO 2011000775 A1	06-01-2011
-----			

**REFERENCES CITED IN THE DESCRIPTION**

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**Patent documents cited in the description**

- KR 1020110137518 [0001]