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(54) **METHOD OF SANITIZING A LAUNDRY CARE MACHINE AND RELATED LAUNDRY CARE MACHINE**

VERFAHREN ZUR DESINFEKTION EINER WÄSCHEPFLEGEMASCHINE UND ZUGEHÖRIGE WÄSCHEPFLEGEMASCHINE

PROCÉDÉ DE DÉSINFECTION D'UNE MACHINE À LAVER ET MACHINE À LAVER ASSOCIÉE

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Description

[0001] The present invention relates to a method of sanitizing a laundry care machine and a laundry care machine adapted for executing such method, and in particular, to a washing machine, a washer/dryer and the like in which processing liquid residuals in a drum or a seal might cause undesirable odor in the drum and the seal ring and generate foreign matters such as molds.

[0002] In a conventional drum washing machine, after washing of clothes is finished, part of processing liquid like washing suds or rinsing water remains in a drum or a seal ring, and as time goes by, the processing liquid remaining in the drum or in the seal ring may cause growth of foreign matters such as molds, and may cause generation of undesirable odor, thereby causing influences on normal use of the user.

[0003] Currently, a cleaning process for a laundry care machine in the prior art provides a system for cleaning the machine by using a cleaning agent. At the same time, some moisture removing methods for drums or seal rings of laundry care machines are further provided in the prior art, wherein some drying apparatus is used to provide hot air into a laundry care machine, thereby removing moisture remaining in the machine. In particular, moisture remaining in a drum or seal ring of such washing machine may be removed.

[0004] However, the known moisture removing method or apparatus cannot completely clean contamination remaining on the seal ring, especially residual water or impurities at the bottom (in a 6 o'clock direction) of the seal ring, such as dirt of washings and washing agent. After a long-term use, the contaminations may generate molds like mildew or ineradicable stains at the position of a door seal, thereby affecting the sanitation and hygiene of the washing machine. Meanwhile, foreign matters such as molds may adhere to the washings or some undesirable odor may permeate into the washings, thereby deteriorating the washing performance of the washing machine.

[0005] Directed to the problem in the prior art that part of processing liquid like washing suds or rinsing water remains in the drum or the seal ring, and as time goes by, the processing liquid remaining in the drum or in the seal ring may cause growth of foreign matters such as molds, and may cause generation of undesirable odor, there is still no effective solution provided currently. Document JP 2004 008544 A discloses a washing machine which carries out a tub drying process to restrict the growth of molds and bacteria. The present invention provides a method of sanitizing a laundry care machine and a laundry care machine adapted for executing such method, so as to at least solve the problem in the prior art that molds are caused by washing residual contamination at the position of a seal ring at a machine door.

[0006] To implement the objective, in one aspect of the present invention, a mold proof control method of a laundry care machine is provided.

[0007] In accordance with the invention, the method of sanitizing a laundry care machine, wherein the laundry care machine includes: a housing; a laundry feed port disposed on the housing; a machine door, used to open and close the feed port; a tub mounted inside the housing; a drum mounted inside the tub and in spatial communication with the tub; a motor, used to control rotation of the drum; a hot air supply apparatus, used to provide hot air into the tub; a seal ring disposed between the machine door and the tub, wherein the bottom of the seal ring has a drainage channel in fluid connection with the tub; and a control apparatus; comprises: (a) upon having the drum empty of laundry, controlling, by the control apparatus, the hot air supply apparatus to provide hot air into the tub; and (b) controlling, by the control apparatus, the motor so that the drum rotates in a set rotation speed.

[0008] By means of the above method, the hot air supply apparatus provides hot air into the tub, and in addition, the drum is rotated, so as to create turbulence within the hot air present in the tub, for spreading the hot air evenly in the tub, the drum and the neighbouring seal ring, and thus evaporating and removing the residual water at the drum, the tub and the machine door positions, and inhibit reproduction of molds like mildew and fungus, and of undesirable odors.

[0009] Preferably, the step a and the step b are performed at the same time. The steps a and b may be performed separately, and when the two steps are performed at the same time, the effect is improved.

[0010] Preferably, in the step b, the control apparatus controls the motor so that drum rotates in a first rotation speed, and then rotates in a second rotation speed higher than the first rotation speed. In the method, the drum first rotates in the first rotation speed to generate vibration, so as to shake off a part of water in the drum system, and then the drum rotates in the second rotation speed higher than the above rotation speed, so as to drive the air flow in the drum to move and become turbulent. Thus the air flow enters the tub through air holes, and may reach the seal ring and its interior at the machine door.

[0011] Preferably, the second rotation speed may be set such that the drum drives the air flow in the tub to blow toward the bottom of the seal ring. The drum rotates in the second rotation speed, the air flow is driven to be blown toward the bottom of the seal ring approximately in the direction of 6 o'clock, thereby implementing removing of the residual water at this place, so that the residual water and impurities at this place flows into a drainage system at the bottom of the drum through a drainage channel.

[0012] Preferably, in the step b, the control apparatus acquires the temperature in the drum; determines whether the temperature in the drum reaches a set value; when the determination result is yes, controls the drum to rotate in the second rotation speed; and when the determination result is not, controls the drum to rotate in the first rotation speed, and continues to determine the temperature in the drum. The control apparatus detects the temperature

in the drum and determines whether it is the set value, when the determination result is no, controls the drum to rotate in the first rotation speed, and continues to determine the temperature in the drum; and when the temperature reaches the set value, and the determination result is yes, the control apparatus controls the drum to high-speed rotate in the second rotation speed, so as to implement combination of the temperature and the rotation, and generate the hot airflow blown toward the bottom of the seal ring, thereby effectively removing the residual water at this place, and achieving sanitizing and sterilization.

[0013] Preferably, the temperature in the drum is detected by a temperature sensor. In the drum, the temperature sensor is used to implement detection of the temperature in the drum.

[0014] Preferably, a set value of the temperature in the drum is between 50°C and 65°C. The temperature in the drum is generally set between 50°C and 65°C, the sterilizing effect is poor when the temperature is extremely low, and the material in the drum may be damaged when the temperature is extremely high.

[0015] Preferably, the duration in the second rotation speed is greater than 10 minutes. The time of the second rotation speed is set to be greater than 10 minutes, which is related to factors such as the capacity and volume of the washing machine, and the duration may be set according to specific machine model.

[0016] Preferably, the second rotation speed is set to at least 255 RPM. The second rotation speed is relatively higher than the first rotation speed, the high rotation speed can promote move of the air flow, and the rotation in the rotation speed of at least 255 RPM can generate a better effect.

[0017] Preferably, the second rotation speed is set to the highest dehydration rotation speed of the machine. When the second rotation speed reaches the set highest rotation speed of the machine, the optimal effect can be achieved.

[0018] Preferably, in step a, the outlet temperature of the hot air supply apparatus is set to 90°C to 130°C. The hot air supply apparatus is used to provide hot air into the tub, and if the temperature is over low, the temperature in the drum can hardly achieve the set value; and if the temperature is over high, the whole system machine system may be caused, and therefore, the outlet temperature is set between 90°C and 130°C.

[0019] Preferably, a washing process is run before the step a. After a long-term use of the machine, some mold plaques might be more or less accumulated at the position of the door seal, and the washing process is set before the sanitizing method, and the whole drum system is cleaned by using a cleaning agent. The washing process may be operated with or without the laundry.

[0020] Preferably, the washing process is run upon having the drum empty of laundry. Accordingly, the sanitizing of the laundry care machine is the only purpose of the washing process, thus enabling use of a specific

cleaning agent instead of ordinary detergent, for dedicatedly attacking and removing possible molds formed.

[0021] According to another aspect of the present invention, a laundry care machine is further provided.

[0022] In accordance with the invention, the laundry care machine includes a housing; a laundry feed port disposed on the housing; a machine door, used to open and close the feed port; an tub mounted inside the housing; a drum mounted inside the tub and in spatial communication with the tub; a motor, used to control rotation of the drum; a hot air supply apparatus, used to provide hot air into the tub; a seal ring disposed between the machine door and the tub, where the bottom of the seal ring has a drainage channel in fluid connection with the tub; and a control apparatus; wherein the control apparatus is configured to perform a process according to any of the above methods for sanitizing the machine.

[0023] Preferably, the control apparatus includes: a hot air control module, used to control the hot air supply apparatus to provide hot air into the tub; and a motor control module, used to control the motor so that the drum rotates in a set rotation speed.

[0024] Preferably, the control apparatus includes: a temperature acquiring module, used to acquire the temperature of the drum; and a determination module, used to determine whether the temperature in the drum reaches a set value, so as to obtain a determination result of yes or no; when the determination result is yes, trigger the motor control module to control the drum to rotate in a second rotation speed; and when the determination result is no, trigger the motor control module to control the drum to rotate in a first rotation speed, and continue to determine the temperature in the drum.

[0025] Preferred facultative embodiments of the invention are described in the dependent claims as attached as well as in the present description, and also demonstrated in the drawing attached. Preferred embodiments of the inventive method imply preferred embodiments of the inventive laundry care machine and vice versa, even if not explained in detail herein. Likewise, absent any apparent conflict, the preferred facultative embodiments in the present application may be combined with one another.

[0026] In the present invention, the problem in the prior art that part of processing liquid like washing suds or rinsing water remains in a drum or a seal ring, and as time goes by, the processing liquid remaining in the drum or in the seal ring may cause growth of foreign matters such as molds, and may cause generation of undesirable odors mitigated by, on one hand, the residual water and impurities at the position of the seal ring of the machine door being removed at least to a considerable extent, and on the other hand, bacteria and molds in the drum being exterminated by heating and drying, thereby inhibiting the reproduction of the molds, and providing better user experiences for the user.

[0027] The accompanying drawing is provided for further understanding of the invention, and is a part of the

present disclosure. Schematic embodiments and specifications of the present invention are now described in detail to provide further explanation of the present invention, but are neither intended to nor provided for being construed to limit the scope of present invention properly. In the drawing:

- FIG. 1 is a schematic diagram of a laundry care machine;
- FIG. 2 is a schematic diagram of the interior of a laundry care machine;
- FIG. 3 is a schematic diagram of a machine door seal ring position of a laundry care machine;
- FIG. 4 is a flow chart of a sanitizing method of a laundry care machine;
- FIG. 5 is a schematic preferred flow chart of a sanitizing method of a laundry care machine;
- FIG. 6 is a structural block diagram of a control apparatus of a laundry care machine;
- FIG. 7 is a preferred structural block diagram of a control apparatus of a laundry care machine;
- FIG. 8 is a schematic flow chart of a sanitizing method of a laundry care machine; and
- FIG. 9 is a schematic diagram of process execution of a sanitizing method of a laundry care machine.

[0028] As shown in FIG. 1, FIG. 2, and FIG. 3, the laundry care machine 1 includes a housing 2; a laundry feed port 3 disposed on the housing; a machine door 4, used to open and close the feed port 3; an tub 5 mounted inside the housing 2; a drum 6 mounted inside the tub 5 and in spatial communication with the tub 5, the drum 6 being provided with holes 60; a motor 7, used to control rotation of the drum 6; a hot air supply apparatus 8, used to provide hot air into the tub 5; a seal ring 9 disposed between the machine door 4 and the tub 5, where the bottom of the seal ring 9 has a drainage channel 10 in fluid connection with the tub 5; and a control apparatus 11.

[0029] FIG. 4 is a flow chart of a sanitizing method of a laundry care machine, and as shown in FIG. 4, the sanitizing method includes:

- a. controlling, by the control apparatus 11, the hot air supply apparatus 8 to provide hot air into the tub 5; and
- b. controlling, by the control apparatus 11, the motor 7 so that the drum 6 rotates in a set rotation speed.

[0030] By means of the above method, the hot air sup-

ply apparatus 8 supplies hot air to the drum 6 and/or the tub 5. The drum 6 has holes 60 and is communicated to the tub 5. Meanwhile, the drum 6 is rotated, so as to remove the residual water at positions of the drum 6, the tub 5 and the machine door 4, and at the same time, inhibit reproduction of molds. As preferred, the step a and the step b are performed at the same time. The steps a and b may be performed separately, and when the two steps are performed at the same time, the effect is improved.

[0031] In the step b, the control apparatus 11 controls the motor 7 so that drum 6 rotates in a first rotation speed S1, and then rotates in a second rotation speed S2 higher than the first rotation speed S1. In the method, the drum 6 first rotates in the first rotation speed S1 to generate vibration, so as to shake off a part of water in the system, and then the drum 6 rotates in the second rotation speed S2 higher than the above rotation speed, so as to drive the air flow in the drum 6 and the tub 5 outside the drum 6 to move. For example, the air flow enters the tub 5 through the air holes 60, and flows toward the seal ring 9 at the machine door 4.

[0032] Preferably, the second rotation speed S2 may be set such that the drum 6 drives the air flow in the tub 5 to blow toward the bottom of the seal ring 9. The drum 6 rotates in the second rotation speed S2, the air flow is driven to be blown toward the bottom of the seal ring 9, especially in the direction of 6 o'clock, thereby implementing removing of the residual water at this place, so that the residual water and impurities at this place flow into a drainage system at the bottom of the tub 5 through a drainage channel 10; otherwise, the residual water in this place might not be removed merely by high temperature.

[0033] In a preferred embodiment, FIG. 5 is a schematic preferred flow chart of a sanitizing method of a laundry care machine 1. As shown in FIG. 5, in the step b, the control apparatus 11 acquires the temperature in the drum 6; determines whether the temperature in the drum 6 reaches a set value; when the determination result is yes, controls the drum 6 to rotate in the second rotation speed; and when the determination result is not, controls the drum 6 to rotate in the first rotation speed, and continues to determine the temperature in the drum 6. The control apparatus 11 controls the drum 6 to high-speed rotate in the second rotation speed, so as to implement combination of the temperature and the rotation, and generate the hot air flow blown toward the bottom of the seal ring 9, thereby effectively removing the residual water at this place, and achieving sanitizing and sterilization.

[0034] Preferably, the temperature in the drum 6 is detected by a temperature sensor 12. In the drum 6, the temperature sensor 12 is used to implement detection of the temperature in the drum 6.

[0035] Preferably, a set value of the temperature in the drum 6 is between 50°C and 65°C. The temperature in the drum 6 is generally set between 50°C and 65°C, the

sterilizing effect is poor when the temperature is too low, and the material in the drum 6 may be damaged when the temperature is extremely high.

[0036] Preferably, the duration in the second rotation speed is greater than 10 minutes. The time of the second rotation speed is set to be greater than 10 minutes, which is related to factors such as the capacity and volume of the laundry care machine 1, and the duration may be set according to specific machine model.

[0037] Preferably, the second rotation speed is set to at least 255 RPM. The second rotation speed is relatively higher than the first rotation speed, the high rotation speed can promote move of the air flow, and the rotation in the rotation speed of at least 255 RPM can generate a better effect.

[0038] Preferably, the second rotation speed is set to the highest dehydration rotation speed of the machine. When the second rotation speed reaches the set highest rotation speed of the machine, the optimal effect can be achieved.

[0039] Preferably, in step a, the outlet temperature of the hot air supply apparatus 8 is set to 90°C to 130°C. The hot air supply apparatus 8 is used to provide hot air into the tub 5, and if the temperature is over low, the temperature in the drum 6 can hardly achieve the set value; and if the temperature is over high, the whole system may be caused to degenerate, and therefore, the outlet temperature is set between 90°C and 130°C.

[0040] Preferably, a washing process is run before the step a. After a long-term use of the machine, some mold plaques are more or less accumulated at the position of the door seal 9, and the washing process is set before the sanitizing method, and the whole system is cleaned by using a specialized cleaning agent.

[0041] Preferably, the washing process includes an idle washing process or a laundry washing process. The washing process may be operated with or without the laundry.

[0042] This embodiment further provides a laundry care machine 1, the laundry care machine 1 that is used to implement the above method, which is described in the embodiment and preferred implementation manner in the foregoing, and is not repeated here. It should be noted that, names of modules in the following apparatus are not intended to actually limit the modules.

[0043] As shown in FIG. 1. FIG. 2 and FIG. 3, the laundry care machine 1 includes a housing 2; a laundry feed port 3 disposed on the housing 2; a machine door 4, used to open and close the feed port 3; an tub 5 mounted inside the housing 2; a drum 6 mounted inside the tub 5 and in spatial communication with the tub 5, the drum 6 being provided with holes 60; a motor 7, used to control rotation of the drum 6; a hot air supply apparatus 8, used to provide hot air into the tub 5; a seal ring 9 disposed between the machine door 4 and the tub 5, where the bottom of the seal ring 9 has a drainage channel 10 in fluid connection with the tub 5; and a control apparatus 11, where the control apparatus 11 is configured to perform sani-

tizing on the laundry care machine 1 as described above.

[0044] FIG. 6 is a structural block diagram of a control apparatus 11 of a laundry care machine 1 according to an improved embodiment. As shown in FIG. 6, the control apparatus 11 includes: a hot air control module 111, used to control the hot air supply apparatus 8 to provide hot air into the tub 5; and a motor control module 112, used to control the motor 7 so that the drum 6 rotates in a set rotation speed.

[0045] FIG. 7 is a structural block diagram of a more preferred control apparatus 11 of a laundry care machine 1. As shown in FIG. 7, the control apparatus 11 includes: a temperature acquiring module 113, used to acquire the temperature of the drum 6; and a determination module 114, used to determine whether the temperature in the drum 6 reaches a set value, so as to obtain a determination result of yes or no; when the determination result is yes, trigger the motor control module 112 to control the drum 6 to rotate in a second rotation speed; and when the determination result is no, trigger the motor control module 112 to control the drum 6 to rotate in a first rotation speed, and continue to determine the temperature in the drum 6.

[0046] FIG. 8 is a schematic flow chart of a sanitizing method of a laundry care machine 1, and FIG. 9 is a schematic diagram of process execution of a sanitizing method of a laundry care machine 1. As shown in FIG. 8 and FIG. 9, in the implementation, the laundry care machine 1 first enters a washing process, as shown in FIG. 9, and the washing process mainly cleans the system, including: 1) setting the system temperature to be lower than 40°C, and cold water being also available for washing; 2) setting reciprocating moving of the drum 6 to lift a large amount of water to a higher level, so as to clean a higher position in the drum 6, as shown in a region A; 3) using a rising process twice, as shown in a region B; and 4) controlling a final dehydration rotation speed to 1200 RPM, as shown in a region C.

[0047] The washing process is dedicated to cleaning some mold plaques inside and outside the drum 6, and at the position of the door seal 9. The washing process includes an idle washing process (i. e., upon having the drum 6 empty of laundry) or a laundry washing process. The washing process may be operated with or without laundry. In an idle case, the whole system may be cleaned by using a specialized cleaning agent. In this washing phase, the temperature in the drum 6 is adjustable.

[0048] Then, a sanitizing process is executed. The control apparatus 11 controls the hot air supply apparatus 8 to supply hot air to the drum 6 and the tub 5. The drum 6 has holes 60 and is communicated to the tub 5. The outlet temperature of the hot air supply apparatus 8 is set to 90°C, thereby gradually rising the temperature in the drum 6, and keeping the temperature in the drum 6 at 60°C, so as to achieve the sterilization effect and requirement in the system.

[0049] As shown in the region D, the control apparatus

11 controls the motor 7 so that the drum 6 first rotates in the first rotation speed S1 to generate vibration, so as to shake off a part of water in the system. A temperature sensor 12 is disposed in the drum 6, so as to acquire the real-time temperature in the drum 6. When the temperature in the drum 6 reaches 60°C, the control apparatus 11 controls the motor 7 to rotate in the second rotation speed S2, higher than the above rotation speed. The second rotation speed is set to at least 255 RPM, when rotating in a high speed, the drum 6 drives the air flow in the drum 6 to move and generate turbulence, and promotes the air flow in the drum 6 to be effectively blown to the position of the door seal 9, that is, the seal ring 9 at the machine door 4, so that the residual water and impurities adhered to the seal ring 9 in the direction of 6 o'clock flows into a drainage system 10 at the bottom of the tub 5, and the system is dried. The duration of the sanitizing process is 10 minutes, and then, the drum 6 stops rotation to enter a cooling process. When the temperature reaches the door-open temperature, a door lock is released.

[0050] By executing the sanitizing process, bacteria and molds generated in the machine 1 may be exterminated, and after the process ends, the drum 6 and the space between the drum 6 and the tub 5 will keep dry, so that the bacteria and molds are not easily generated. More importantly, the residual water and impurities that locates at the position of the seal ring 9 of the machine door 4 and are difficult to be removed normally can be removed by the above process, thereby keeping a cleaner machine state and preventing the machine 1 from being contaminated.

[0051] By means of the present invention, the problem in the prior art that molds are caused by washing liquid residual contamination, is solved by, on one hand, the residual water and impurities at the position of the seal ring 9 of the machine door 4 are reduced, and on the other hand, bacteria and molds in the drum 6 are exterminated by drying, thereby inhibiting their reproduction and growth, and providing better user experiences for the user.

[0052] The specific implementation manners described in the foregoing and shown in the accompanying drawings are merely used to describe the present invention in greater detail, and are not the entire disclosure of the present invention. In the scope of the basic technical ideas in the present invention, variations in any form made by persons of ordinary skill in the art shall all fall within the protection scope of the present invention.

LIST OF REFERENCE NUMERALS

[0053]

1	Laundry care machine
2	Housing
3	Laundry feed port
4	Machine door

5	Tub
6	Drum
7	Motor
8	Hot air supply apparatus
9	Seal ring
10	Drainage channel
11	Control apparatus
12	Temperature sensor
60	hole
10	111 hot air control module
	112 motor control module
	113 temperature acquiring module
	114 determination module

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Claims

1. A method of sanitizing a laundry care machine (1), wherein the laundry care machine (1) includes:

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a housing (2);
 a laundry feed port (3) disposed on the housing (2);
 a machine door (4), used to open and close the feed port (3);
 a tub (5) mounted inside the housing (2);
 a drum (6) mounted inside the tub (5) and in spatial communication with the tub (5);
 a motor (7), used to control rotation of the drum (6);
 a hot air supply apparatus (8), used to provide hot air into the tub (5);
 a seal ring (9) disposed between the machine door (4) and the tub (5), wherein the bottom of the seal ring (9) has a drainage channel (10) in fluid connection with the tub (5); and
 a control apparatus (11);
 wherein the method comprises:

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- a. upon having the drum (6) empty of laundry, controlling, by the control apparatus (11), the hot air supply apparatus (8) to provide hot air into the tub (5); and
 b. controlling, by the control apparatus (11), the motor (7) so that the drum (6) rotates in a set rotation speed.
2. The method according to claim 1, wherein the step a and the step b are performed at the same time.
3. The method according to any preceding claim, wherein in the step b, the control apparatus (11) controls the motor (7) so that the drum (6) first rotates in a first rotation speed, and then rotates in a second rotation speed greater than the first rotation speed.
4. The method according to claim 3, wherein: the second rotation speed is set so that the drum (6) drives

the air flow in the tub (5) to be blown into the bottom of the seal ring (9).

5. The method according to any of claims 3 and 4, wherein
in step b, the control apparatus (11) acquires the temperature in the drum (6); determines whether the temperature in the drum (6) reaches a set value; when a determination result is yes, controls the drum (6) to rotate in the second rotation speed; and when the determination result is not, controls the drum (6) to rotate in the first rotation speed, and continues to determine the temperature in the drum (6). 5
6. The method according to claim 5, wherein the temperature in the drum (6) is detected by using a temperature sensor (12). 15
7. The method according to any of claims 5 and 6, wherein a set value of the temperature of the drum (6) is between 50°C and 65°C. 20
8. The method according to claim 4, wherein the duration of the second rotation speed is greater than 10 minutes. 25
9. The method according to claim 4, wherein the second rotation speed is set to at least 255 RPM.
10. The method according to claim 9, wherein the second rotation speed is set to the highest rotation speed for dehydration set for the machine (1). 30
11. The method according to any preceding claim, wherein in step a, the outlet temperature of the hot air supply apparatus (8) is set to 90°C and 130°C. 35
12. The method according to any claim, wherein a washing process is run before the step a.
13. The method according to claim 12, wherein: the washing process is run upon having the drum (6) empty of laundry.
14. A laundry care machine (1), comprising: 45
 - a housing (2);
 - a laundry feed port (3) disposed on the housing (2);
 - a machine door (4), used to open and close the feed port (3); 50
 - a tub (5) mounted inside the housing (2);
 - a drum (6) mounted inside the tub (5) and in spatial communication with the tub (5);
 - a motor (7), used to control rotation of the drum (6); 55
 - a hot air supply apparatus (8), used to provide hot air into the tub (5);

a seal ring (9) disposed between the machine door (4) and the tub (5), wherein the bottom of the seal ring (9) has a drainage channel (10) in fluid connection with the tub (5); and
a control apparatus (11); and
wherein the control apparatus (11) is configured to perform a process according to the method according to any one of the preceding claims.

15. The laundry care machine (1) according to claim 14, wherein, the control apparatus (11) comprises:
 - a hot air control module (111), used to control the hot air supply apparatus (8) to provide hot air into the tub (5); and
 - a motor control module (112), used to control the motor (7) so that the drum (6) rotates in a set rotation speed.
16. The laundry care machine (1) according to claim 15, wherein the control apparatus (11) comprises:

a temperature acquiring module (113), used to acquire the temperature of the drum (6); and
a determination module (114), used to determine whether the temperature in the drum (6) reaches a set value, so as to obtain a determination result of yes or no;
when the determination result is yes, trigger the motor control module (112) to control the drum (6) to rotate in a second rotation speed; and
when the determination result is no, trigger the motor control module (112) to control the drum (6) to rotate in a first rotation speed, and continue to determine the temperature in the drum (6).

Patentansprüche

- 40 1. Verfahren zum Desinfizieren einer Wäschepflegemaschine (1), wobei die Wäschepflegemaschine (1) Folgendes aufweist:
 - ein Gehäuse (2),
 - eine an dem Gehäuse (2) angeordnete Wäscheeinlegeöffnung (3),
 - eine Maschinentür (4), die zum Öffnen und Verschließen der Einlegeöffnung (3) verwendet wird,
 - einen in dem Gehäuse (2) montierten Laugenbehälter (5),
 - eine in dem Laugenbehälter (5) montierte Trommel (6), die mit dem Laugenbehälter (5) räumlich verbunden ist,
 - einen Motor (7), der zum Steuern der Rotation der Trommel (6) verwendet wird,
 - eine Heißluftzufuhrvorrichtung (8), die zum Einspeisen von Heißluft in den Laugenbehälter (5)

verwendet wird,
einen Dichtungsring (9), der zwischen der Maschinentür (4) und dem Laugenbehälter (5) angeordnet ist, wobei der untere Teil des Dichtungsringes (9) einen Ablaufkanal (10) aufweist, der mit dem Laugenbehälter (5) fluidverbunden ist, und
eine Steuervorrichtung (11),
wobei das Verfahren Folgendes umfasst:

- a) wenn die Trommel (6) keine Wäsche mehr enthält, derartiges Steuern der Heißluftzufuhrvorrichtung (8) durch die Steuervorrichtung (11), dass die Heißluftzufuhrvorrichtung (8) Heißluft in den Laugenbehälter (5) einspeist, und
- b) derartiges Steuern des Motors (7) durch die Steuervorrichtung (11), dass sich die Trommel (6) mit einer eingestellten Drehzahl dreht.

2. Verfahren nach Anspruch 1, wobei Schritt a) und Schritt b) gleichzeitig ausgeführt werden.
3. Verfahren nach einem der vorhergehenden Ansprüche, wobei die Steuervorrichtung (11) bei Schritt b) den Motor (7) so steuert, dass sich die Trommel (6) zuerst mit einer ersten Drehzahl und dann mit einer zweiten Drehzahl dreht, die höher ist als die erste Drehzahl.
4. Verfahren nach Anspruch 3, wobei die zweite Drehzahl so eingestellt wird, dass die Trommel (6) den Luftstrom im Laugenbehälter (5) in den unteren Teil des Dichtungsringes (9) drückt.
5. Verfahren nach einem der Ansprüche 3 bis 4, wobei die Steuervorrichtung (11) bei Schritt b) die Temperatur in der Trommel (6) misst, ermittelt, ob die Temperatur in der Trommel (6) einen Sollwert erreicht, wenn ein Ergebnis der Ermittlung Ja ist, die Trommel (6) so steuert, dass sie sich mit der zweiten Drehzahl dreht, und wenn das Ergebnis der Ermittlung Nein ist, die Trommel (6) so steuert, dass sie sich mit der ersten Drehzahl dreht, und weiterhin die Temperatur in der Trommel (6) ermittelt.
6. Verfahren nach Anspruch 5, wobei die Temperatur in der Trommel (6) durch Verwendung eines Temperatursensors (12) erfasst wird.
7. Verfahren nach einem der Ansprüche 5 und 6, wobei ein Sollwert der Temperatur der Trommel (6) zwischen 50°C und 65°C liegt.
8. Verfahren nach Anspruch 4, wobei die Dauer der zweiten Drehzahl mehr als 10 Minuten beträgt.

9. Verfahren nach Anspruch 4, wobei die zweite Drehzahl auf mindestens 255 U/min eingestellt wird.

10. Verfahren nach Anspruch 9, wobei die zweite Drehzahl auf die für die Maschine (1) eingestellte höchste Drehzahl zum Trocknen eingestellt wird.

11. Verfahren nach einem der vorhergehenden Ansprüche, wobei bei Schritt a) die Auslasstemperatur der Heißluftzufuhrvorrichtung (8) auf 90°C und 130°C eingestellt wird.

12. Verfahren nach einem beliebigen Anspruch, wobei vor Schritt a) ein Waschvorgang ausgeführt wird.

13. Verfahren nach Anspruch 12, wobei der Waschvorgang ausgeführt wird, wenn die Trommel (6) keine Wäsche mehr enthält.

14. Wäschepflegemaschine (1), die Folgendes umfasst:

ein Gehäuse (2),
eine an dem Gehäuse (2) angeordnete Wäscheinlegeöffnung (3),
eine Maschinentür (4), die zum Öffnen und Verschließen der Einlegeöffnung (3) verwendet wird,
einen in dem Gehäuse (2) montierten Laugenbehälter (5),
eine in dem Laugenbehälter (5) montierte Trommel (6), die mit dem Laugenbehälter (5) räumlich verbunden ist,
einen Motor (7), der zum Steuern der Rotation der Trommel (6) verwendet wird,
eine Heißluftzufuhrvorrichtung (8), die zum Einspeisen von Heißluft in den Laugenbehälter (5) verwendet wird,
einen Dichtungsring (9), der zwischen der Maschinentür (4) und dem Laugenbehälter (5) angeordnet ist, wobei der untere Teil des Dichtungsringes (9) einen Ablaufkanal (10) aufweist, der mit dem Laugenbehälter (5) fluidverbunden ist, und
eine Steuervorrichtung (11), und
wobei die Steuervorrichtung (11) so konfiguriert ist, dass sie einen Vorgang gemäß dem Verfahren nach einem der vorhergehenden Ansprüche ausführt.

15. Wäschepflegemaschine (1) nach Anspruch 14, wobei die Steuervorrichtung (11) Folgendes umfasst:

ein Heißluftsteuermodul (111), das zum derartigen Steuern der Heißluftzufuhrvorrichtung (8) verwendet wird, dass diese Heißluft in den Laugenbehälter (5) einspeist, und
ein Motorsteuermodul (112), das zum derartigen Steuern des Motors (7) verwendet wird,

dass sich die Trommel (6) mit einer eingestellten Drehzahl dreht.

16. Wäschepflegemaschine (1) nach Anspruch 15, wobei die Steuervorrichtung (11) Folgendes umfasst:

ein Temperaturmessmodul (113), das zum Messen der Temperatur der Trommel (6) verwendet wird, und
ein Ermittlungsmodul (114), das zum Ermitteln verwendet wird, ob die Temperatur in der Trommel (6) einen Sollwert erreicht, so dass als Ergebnis der Ermittlung ein Ja oder Nein gewonnen wird,
wenn das Ergebnis der Ermittlung Ja ist, Auslösen des Motorsteuermoduls (112), damit es die Trommel (6) so steuert, dass sie sich mit einer zweiten Drehzahl dreht, und
wenn das Ergebnis der Ermittlung Nein ist, Auslösen des Motorsteuermoduls (112), damit es die Trommel (6) so steuert, dass sie sich mit einer ersten Drehzahl dreht, und weiteres Ermitteln der Temperatur in der Trommel (6).

Revendications

1. Procédé de désinfection d'une machine à laver (1), dans lequel la machine à laver (1) comporte :

un boîtier (2) ;
un orifice d'alimentation du linge (3) disposé sur le boîtier (2) ;
une porte de machine (4), utilisée pour ouvrir et fermer l'orifice d'alimentation (3) ;
une cuve (5) montée à l'intérieur du boîtier (2) ;
un tambour (6) monté à l'intérieur de la cuve (5) et en communication spatiale avec la cuve (5) ;
un moteur (7), utilisé pour commander la rotation du tambour (6) ;
un appareil d'alimentation en air chaud (8), utilisé pour apporter de l'air chaud dans la cuve (5) ;
une bague d'étanchéité (9) disposée entre la porte de machine (4) et la cuve (5), le fond de la bague d'étanchéité (9) ayant un canal de drainage (10) en liaison fluide avec la cuve (5) ; et
un appareil de commande (11) ;
dans lequel le procédé consiste à :

- a. lorsque le tambour (6) est vide de linge, commander, par l'appareil de commande (11), l'appareil d'alimentation en air chaud (8) pour apporter l'air chaud dans la cuve (5) ; et
b. commander, par l'appareil de commande (11), le moteur (7) de sorte que le tambour (6) tourne à une vitesse de rotation définie.

2. Procédé selon la revendication 1, dans lequel l'étape a et l'étape b sont exécutées en même temps.

3. Procédé selon une quelconque des revendications précédentes, dans lequel dans l'étape b, l'appareil de commande (11) commande le moteur (7) de sorte que le tambour (6) tourne d'abord à une première vitesse de rotation, puis tourne à une seconde vitesse de rotation supérieure à la première vitesse de rotation.

4. Procédé selon la revendication 3, dans lequel : la seconde vitesse de rotation est définie de telle sorte que le tambour (6) entraîne le flux d'air dans la cuve (5) pour qu'il souffle dans le fond de la bague d'étanchéité (9).

5. Procédé selon une quelconque des revendications 3 et 4, dans lequel, dans l'étape b, l'appareil de commande (11) acquiert la température dans le tambour (6) ;
détermine si la température dans le tambour (6) atteint une valeur définie ;
lorsqu'un résultat de détermination est oui, commande le tambour (6) pour qu'il tourne dans la seconde vitesse de rotation ; et
lorsque le résultat de détermination est non, commande le tambour (6) pour qu'il tourne dans la première vitesse de rotation, et continue à déterminer la température dans le tambour (6).

6. Procédé selon la revendication 5, dans lequel la température dans le tambour (6) est détectée en utilisant un capteur de température (12).

7. Procédé selon une quelconque des revendications 5 et 6, dans lequel une valeur définie de la température du tambour (6) est entre 50 °C et 65 °C.

8. Procédé selon la revendication 4, dans lequel la durée de la seconde vitesse de rotation est supérieure à 10 minutes.

9. Procédé selon la revendication 4, dans lequel la seconde vitesse de rotation est définie à au moins 255 tr/min.

10. Procédé selon la revendication 9, dans lequel la seconde vitesse de rotation est définie sur la vitesse de rotation la plus élevée pour la déshydratation définie pour la machine (1).

11. Procédé selon une quelconque des revendications précédentes, dans lequel dans l'étape a, la température de sortie de l'appareil d'alimentation en air chaud (8) est définie sur 90 °C et 130 °C.

12. Procédé selon une quelconque des revendications,

dans lequel un processus de lavage est lancé avant l'étape a.

13. Procédé selon la revendication 12, dans lequel: le processus de lavage est lancé lorsque le tambour (6) est vide de linge. 5

14. Machine à laver (1), comprenant :

un boîtier (2) ; 10
 un orifice d'alimentation du linge (3) disposé sur le boîtier (2) ;
 une porte de machine (4), utilisée pour ouvrir et fermer l'orifice d'alimentation (3) ;
 une cuve (5) montée à l'intérieur du boîtier (2) ; 15
 un tambour (6) monté à l'intérieur de la cuve (5) et en communication spatiale avec la cuve (5) ;
 un moteur (7), utilisé pour commander la rotation du tambour (6) ;
 un appareil d'alimentation en air chaud (8), utilisé pour apporter de l'air chaud dans la cuve (5) ; 20
 une bague d'étanchéité (9) disposée entre la porte de machine (4) et la cuve (5), le fond de la bague d'étanchéité (9) ayant un canal de drainage (10) en liaison fluïdique avec la cuve (5) ; et 25
 un appareil de commande (11) ; et
 dans lequel l'appareil de commande (11) est configuré pour exécuter un processus selon le procédé selon une quelconque des revendications précédentes. 30

15. Machine à laver (1) selon la revendication 14, dans lequel l'appareil de commande (11) comprend : 35

un module de commande d'air chaud (111), utilisé pour commander l'appareil d'alimentation en air chaud (8) pour apporter l'air chaud dans la cuve (5) ; et
 un module de commande de moteur (112), utilisé pour commander le moteur (7) de sorte que le tambour (6) tourne à une vitesse de rotation définie. 40

16. Machine à laver (1) selon la revendication 15, dans lequel l'appareil de commande (11) comprend : 45

un module d'acquisition de température (113), utilisé pour acquérir la température du tambour (6) ; et 50
 un module de détermination (114), utilisé pour déterminer si la température dans le tambour (6) atteint une valeur définie, de manière à obtenir un résultat de détermination de oui ou non ;
 lorsque le résultat de détermination est oui, déclencher le module de commande de moteur (112) pour commander le tambour (6) de tourner dans une seconde vitesse de rotation ; et 55

lorsque le résultat de détermination est non, déclencher le module de commande de moteur (112) pour commander le tambour (6) de tourner dans une première vitesse de rotation, et continuer à déterminer la température dans le tambour (6).

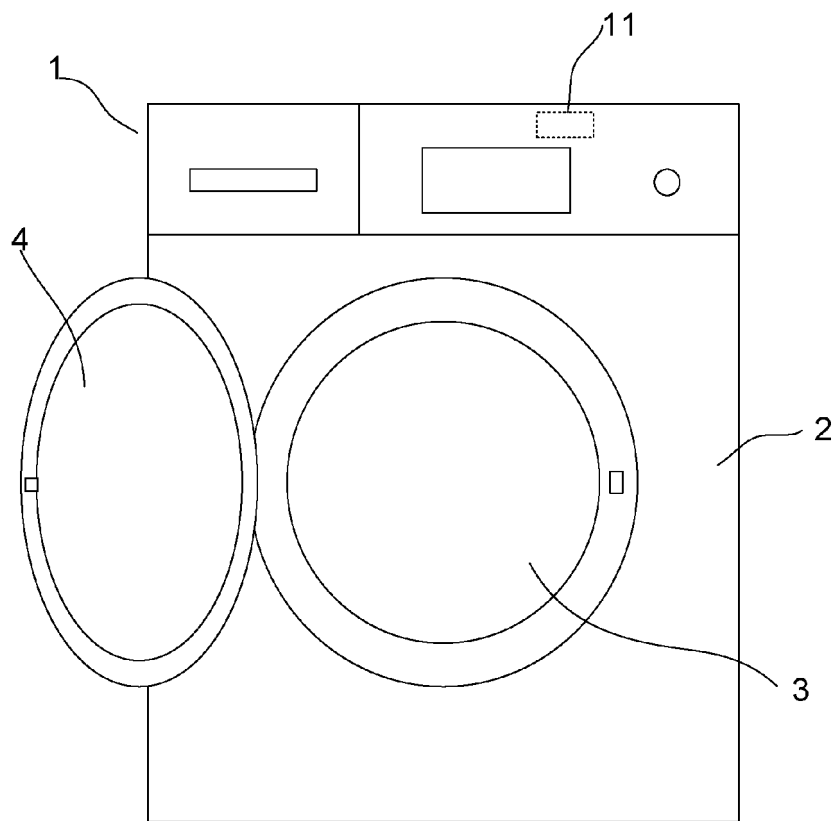


FIG. 1

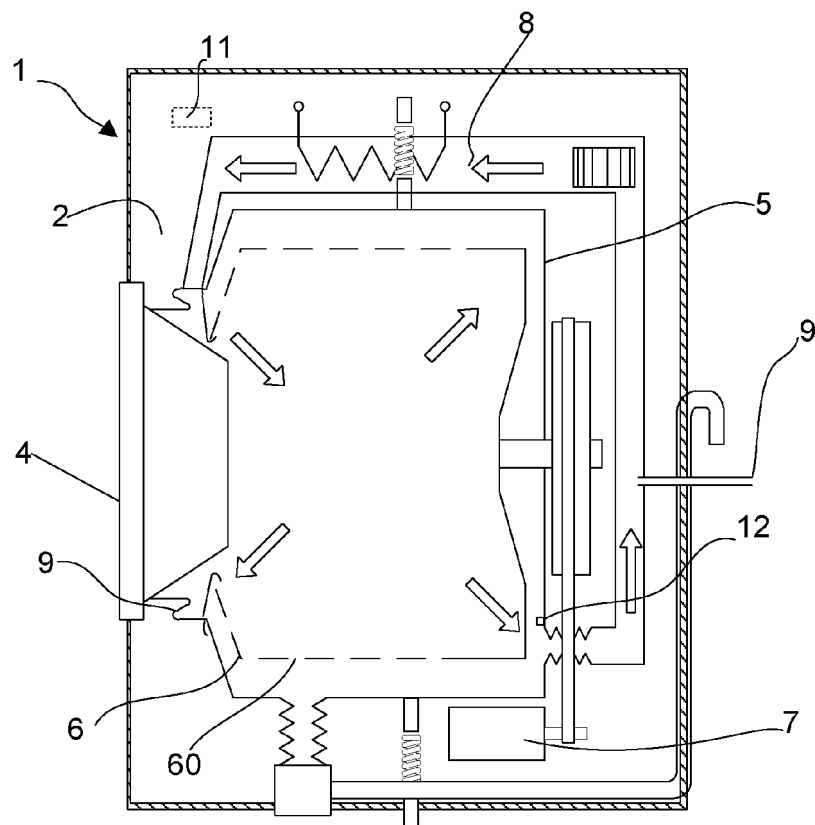


FIG. 2

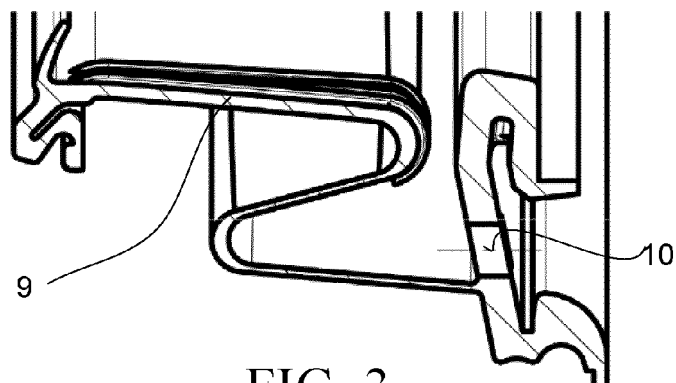


FIG. 3

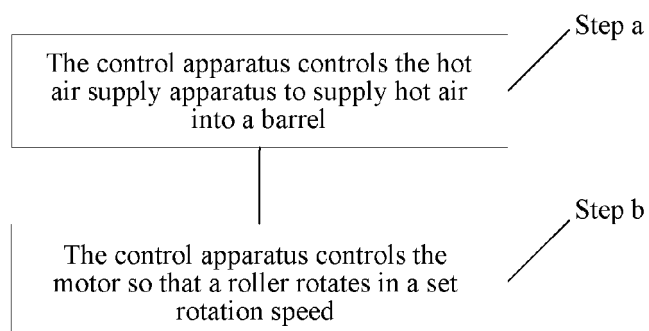


FIG. 4

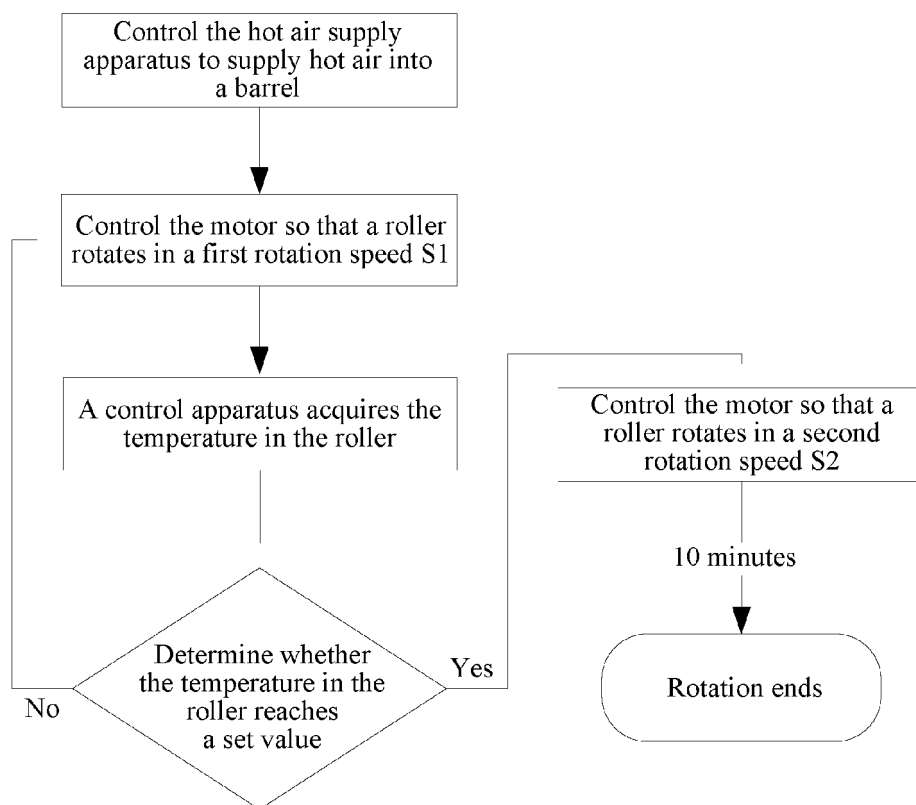


FIG. 5

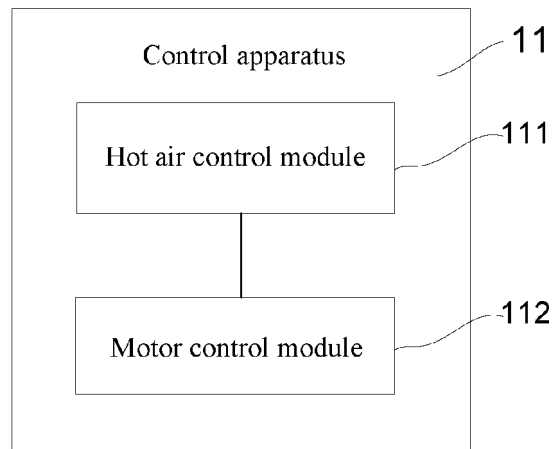


FIG. 6

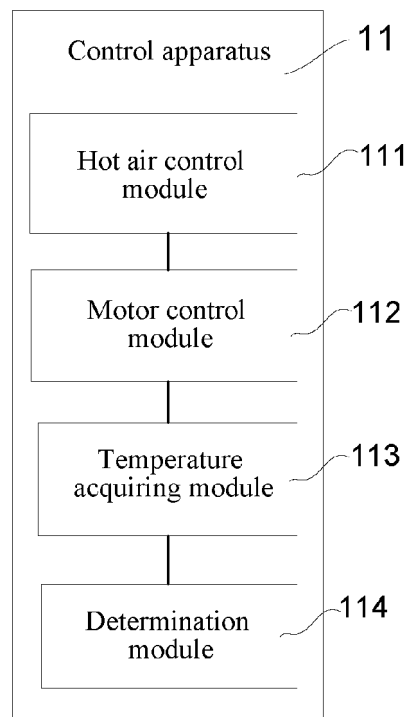


FIG. 7

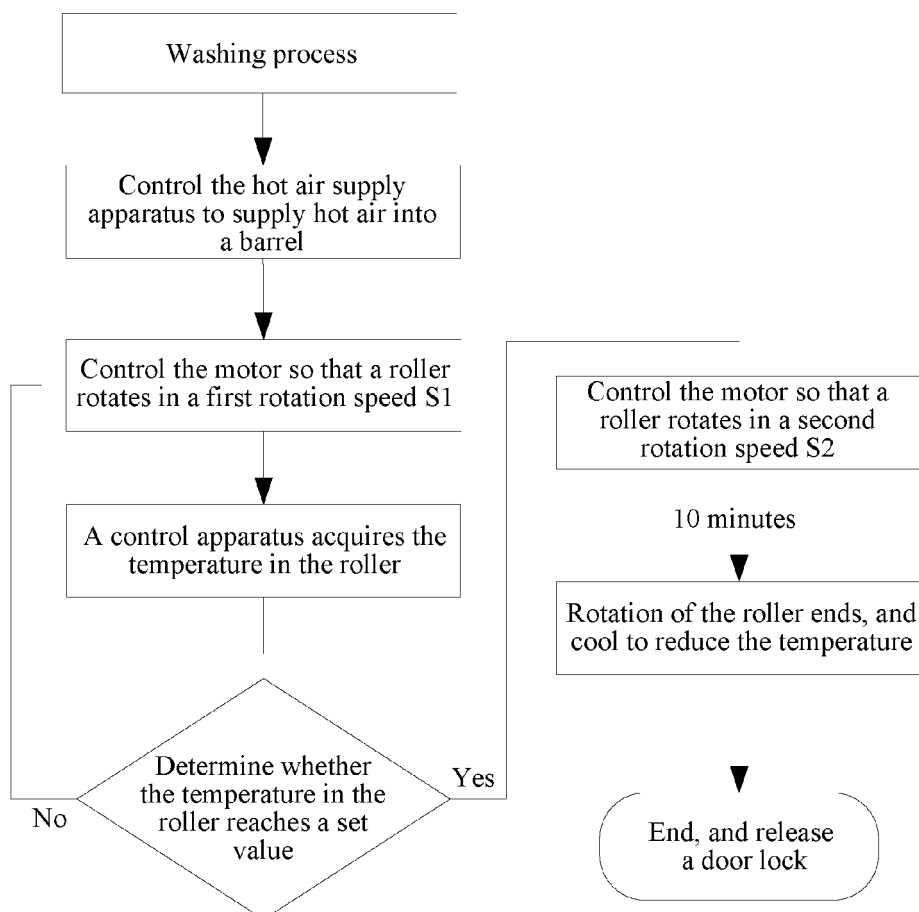


FIG. 8

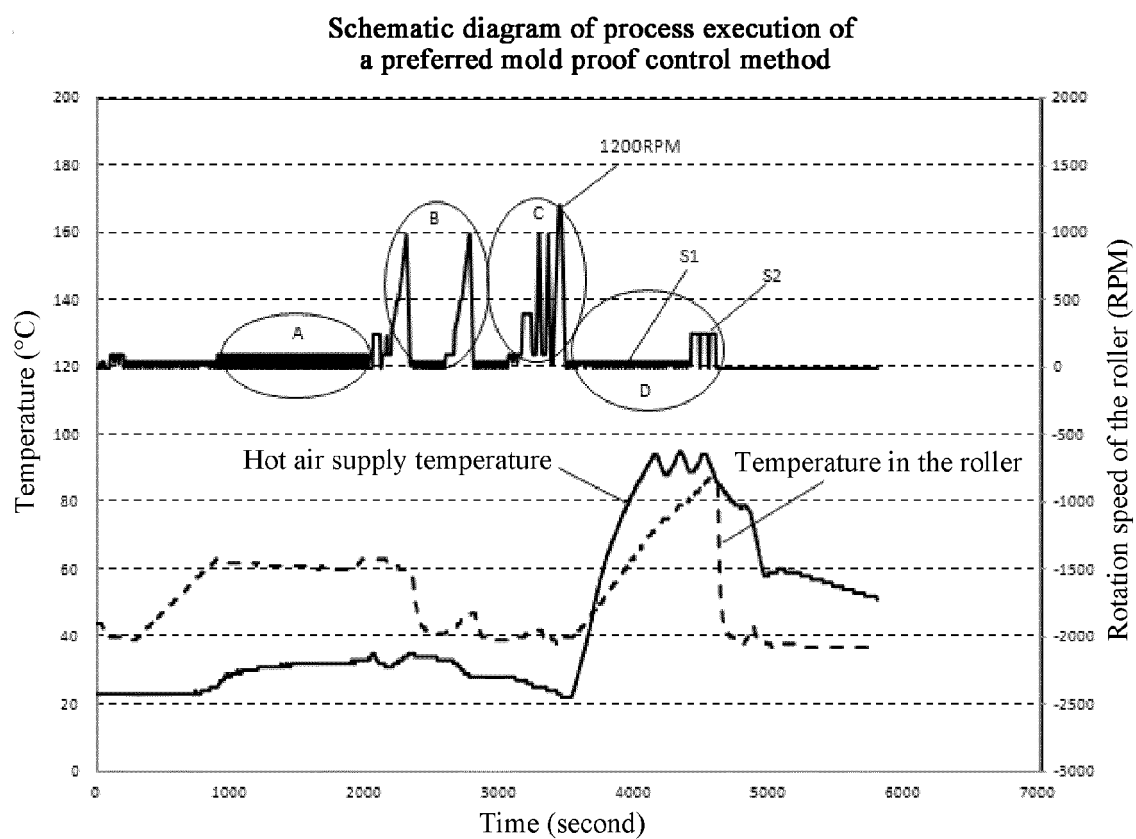


FIG. 9

REFERENCES CITED IN THE DESCRIPTION

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