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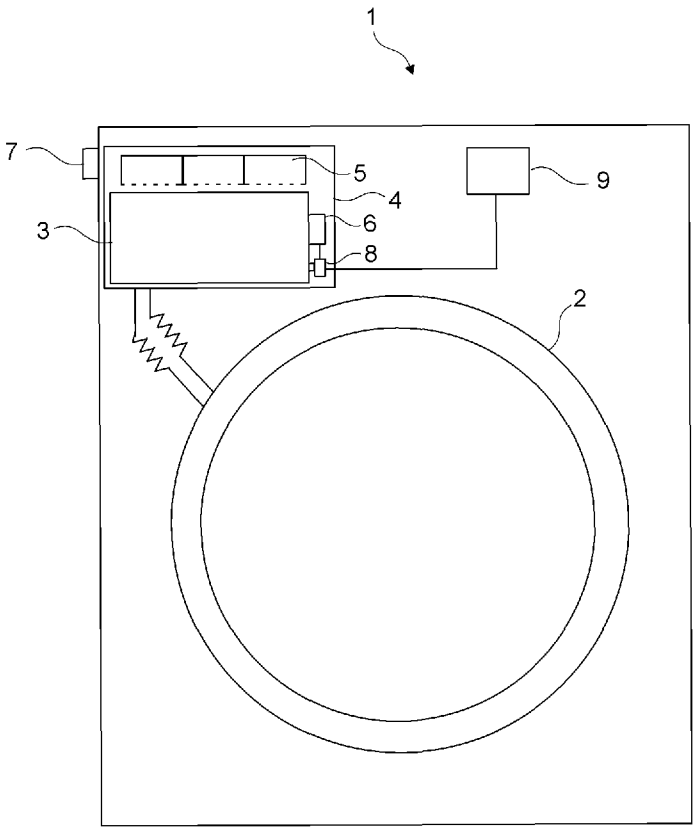
(54) Title: A LAUNDRY OR A DISH WASHING MACHINE



(57) Abstract: The present invention relates to a washing machine (1) that is used in cleaning items like dishes, laundry by washing with water, comprising a tub (2) wherein the washing process is performed, a cleaning agent dispenser (3) having at least one cubicle for placing the liquid and/or powder cleaning agents, a distributor (5) disposed on the cleaning agent dispenser (3) that directs the water received from the main supply to the cleaning agent dispenser (3) and a chamber (4) wherein the cleaning agent dispenser (3) and the distributor (5) are situated.

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Description

A LAUNDRY OR A DISH WASHING MACHINE

[0001] The present invention relates to a washing machine comprising a cleaning agent dispenser.

[0002] In washing machines, for example in laundry and dish washing machines, the cleaning agent required for the cleaning process is placed in a cleaning agent dispenser. The wash water received from the water inlet and heated if required is directed to the cleaning agent dispenser by means of a distributor disposed on the cleaning agent dispenser that facilitates receiving the cleaning agent into the washing tub. The dissolved-melted cleaning agent passes into the washing tub together with the water. The cleaning agent dispensers usually comprise cubicles wherein the powder and/or liquid cleaning agent are placed.

[0003] In washing machines, by time, the accumulation of mold and various microorganisms on the washing agent dispenser and the distributor is observed that result from the detergent and softener. These microorganisms can be carried to the tub with the water received into the machine and form stains on the laundry. In some cases, (as a result of combined factors such as small amount of or poor quality detergent, selection of low temperature) these microorganisms on the laundry can threaten human health. In order not to be confronted with this kind of adversaries, the users have to clean the cleaning agent dispenser at certain intervals. However, the cleaning of the cleaning agent dispenser cannot be made easily by the users. Particularly, the formation of microorganism groups on the distributor cannot be prevented.

[0004] In state of the art, high pressure water is received for the purpose of washing the cleaning agent dispenser so that this cleaning process is made independent of the user. Furthermore, one of the applications designed for washing the cleaning agent dispenser is explained below.

[0005] In the state of the art German Patent Application no. DE10122514, a cleaning agent dispenser is explained having self cleaning structured walls wherein the cleaning agent comes in contact with. The self cleaning property of the cleaning agent dispenser is attained by the surfaces in contact with the cleaning agent having a micro-structured configuration.

[0006] The object of the present invention is to design a washing machine whereby the microorganisms formed in the chamber containing the cleaning agent are removed there from.

[0007] The washing machine designed to fulfill the object of the present invention, explicated in the first claim and the respective claims thereof, comprises a light source that emits ultraviolet radiation, illuminating the chamber wherein the cleaning agent dispenser and the distributor are placed.

[0008] By using the ultraviolet light source, the microorganisms formed in the chamber resulting from detergent and softener are eliminated. The ultraviolet light source is disposed at such a position that the chamber is partially or entirely illuminated.

[0009] In an embodiment of the present invention, the ultraviolet light source is disposed in the chamber. Consequently, the parts of the chambers wherein the microorganisms are abundant, particularly the cleaning agent dispenser and the distributor are directly interacted by the ultraviolet radiation.

[0010] In another embodiment of the present invention, the light source is disposed outside the chamber. In this embodiment, the light source is prevented from being effected by the water and moisture in the chamber.

[0011] In yet another embodiment of the present invention, the chamber, dispenser and the distributor on the dispenser are made of a transparent material providing the light source to illuminate all the surfaces in the chamber. Thus the light source can make an effective illumination in the chamber and the microorganisms can be removed from the chamber. With this embodiment, the light source positioned outside the chamber is enabled to illuminate the inside of the chamber.

[0012] In another embodiment of the present invention, light carriers are provided between the light source and the chamber that receive almost all of the radiation emitted by the light source and transmit to the chamber. By using light carriers, ultraviolet light is transmitted to a region in the chamber particularly where the ultraviolet light is desired to be focused effectively.

[0013] In another embodiment of the present invention, the chamber, dispenser and distributor is coated with a material having a photocatalyst property or produced of this type of material. The ultraviolet light source and the photocatalyst material interact and the free radicals such as ozone and OH ions are formed on the surface coated with the photocatalyst material. Consequently, the surface gains a hydrophilic characteristic as a result of the interaction of the surface coated with the photocatalyst material and the ultraviolet radiation. Water forms a thin film on this surface having a hydrophilic characteristic and as a result, the adhesion of foreign substances (dirt, dust, microorganisms etc.) on the surface is prevented. Besides, the free radicals formed as a result of the interaction of the photocatalyst material and the ultraviolet light source help in removing

the microorganisms on the cleaning agent dispenser and also in disinfecting the main water supply.

[0014] In another embodiment of the present invention, the light source can be activated by the user. The user can activate the light source when required for as long as deemed necessary.

[0015] In another embodiment of the present invention, a switch is provided in the washing machine that turns off the light source when the cleaning agent dispenser is detached from the chamber to prevent the user from being harmed with the ultraviolet rays. This function can also be provided by a sensor that detects the position of the cleaning agent dispenser in the chamber instead of the switch. Consequently, the rays emitted from the light source are prevented from reaching the user and harming the eyes by diffusing outside when the cleaning agent dispenser is detached from the chamber.

[0016] In another embodiment of the present invention, a control unit is used for controlling the light source independent of the user. In an embodiment of the present invention, this light source is turned on and off periodically while the washing program is carried on.

[0017] In another embodiment of the present invention, the light source is turned on by the control unit at the start or end of each washing program for a certain period of time.

[0018] In an alternative embodiment wherein the light source is controlled by the control unit, when the number of washing programs determined by the producer is reached, the light source is turned on to illuminate the chamber.

[0019] By means of the present invention, the chamber is decontaminated of the microorganisms and similar foreign substances also gaining a hygienic property without requiring the detachment of the cleaning agent dispenser by the user

[0020] The washing machine designed to fulfill the objective of the present invention is illustrated in the attached figures, where:

[0021] Figure 1 – is the schematic view of a washing machine.

[0022] Figure 2 – is the top perspective view of a chamber and the cleaning agent dispenser.

[0023] Figure 3 – is the view of a light source and the detail A of the switch.

[0024] The elements illustrated in the figures are numbered as follows:

1. Washing machine
2. Tub
3. Cleaning agent dispenser
4. Chamber
5. Distributor

6. Light source
7. Knob
8. Switch
9. Control unit

[0025] The washing machine (1) is used for cleaning items such as dishes or laundry by washing with water.

[0026] The washing machine (1) of the present invention comprises a tub (2) wherein the washing process is carried out and a chamber (4) wherein cleaning agents are placed.

[0027] The washing machine (1) furthermore comprises a light source (6) that emits ultraviolet radiation partially or entirely illuminating the inside of the chamber (4). When the light source (6) is turned on, the microorganisms resulting particularly from detergent and softener residues are eliminated (Figure 1).

[0028] The light source (6) is situated in the chamber (4). The light source (6) disposed in the chamber (4) illuminates the interior of the chamber (4). The rays emitted at a certain wavelength from the light source (6) destroy the microorganisms accumulated on the chamber (4).

[0029] The washing machine (1) comprises a cleaning agent dispenser (3) having at least one cubicle wherein liquid and/or powder cleaning agents are placed, to be delivered to the tub (2) and a distributor (5) disposed on the cleaning agent dispenser (3) that directs the water received from the main supply to the cleaning agent dispenser (3). The cleaning agent dispenser (3) and the distributor (5) are situated inside the chamber (4).

[0030] In another embodiment of the present invention, the light source (6) is disposed outside the chamber (4). Thus the light source (6) is prevented from being effected by the water received into the chamber (4) and the inside of the chamber (4) can be illuminated more effectively.

[0031] In another embodiment of the present invention, the chamber (4) is produced of an optically transparent or semi-transparent material. Thus a greater amount of the radiation emitted from the light source (6) can reach almost all the places of the chamber (4). Besides, by making the chamber (4) transparent or semi-transparent, the light source (6) is enabled to be disposed outside of the chamber (4).

[0032] In another embodiment of the present invention, the cleaning agent dispenser (3) and/or the distributor (5) disposed in the chamber (4) is produced of an optically transparent or semi-transparent material. Consequently, the ultraviolet radiation can reach almost all the places of the cleaning agent dispenser (3) and/or the distributor (5)

providing to remove the microorganisms resulting from residues of detergent and softener accumulated on the cleaning agent dispenser (3) and/or the distributor (5).

[0033] In an alternative embodiment of the present invention, the washing machine (1) comprises light carriers (not shown in the figures) that are disposed between the light source (6) and the chamber (4) that provide to transmit the radiation emitted by the light source (6) into to the chamber (4) with minimum loss. Thus the necessity of disposing the light source (6) inside or in the vicinity of the chamber (4) is eliminated and the places farther away from the light source (6) can also be illuminated. In this embodiment of the present invention, fiber optic cables can be used as light carriers. Besides, by means of this embodiment, only the desired places in the chamber (4) can be illuminated.

[0034] In another embodiment of the present invention, the surfaces of the chamber (4) are coated with a material having a photocatalyst property. Consequently, the free radicals such as ozone and OH ions that are formed by the interaction of the light emitted by the ultraviolet light source (6) in the chamber (4) and the surface coated with the photocatalyst material results in the surface gaining a hydrophilic characteristic and the formation of a thin film of water on this surface. Consequently, the microorganisms such as mold, bacteria are prevented from residing on the surfaces of the chamber (4). With this embodiment, the chamber (4) is provided with a hygienic property. In this embodiment of the present invention, the surfaces of the cleaning agent dispenser (3) and/or the distributor (5) disposed in the chamber (4) are also coated with a material having photocatalyst property.

[0035] In this embodiment of the present invention, when the light source (6) is turned on to be activated, water is received into the chamber (4). In this embodiment, a thin film of water is formed on the surfaces coated with the photocatalyst material that interact with ultraviolet radiation. The adhesion of foreign substances such as dirt, microorganisms etc. on the film are prevented and the foreign substances on the surface are cleaned. In this embodiment of the present invention, the water received from the main supply is also disinfected while passing through the chamber (4) before reaching the tub (2) by the free radicals formed as a result of the interaction of the photocatalyst surface and the ultraviolet radiation. Besides, the free radicals are delivered to the tub (2) together with the water received from the main supply and contribute in cleaning of the laundry in the tub (2).

[0036] In another embodiment of the present invention, the washing machine (1) comprises a control unit (9) that turns on or off the light source (6) at certain intervals or

according to the washing program.

[0037] In another embodiment of the present invention, the control unit (9) turns on and off the light source (6) periodically while the washing program is in progress.

[0038] In yet another embodiment of the present invention, the light source (6) is turned on by the control unit (9) at the start or end of each washing program for a certain period of time illuminating and removing the accumulated microorganisms in the chamber (4).

[0039] In another embodiment of the present invention, the control unit (9) turns on the light source (6) when the number of washing programs determined by the producer is reached. For example, in every ten washing performed by the washing machine (1), the light source (6) is turned on to eliminate the accumulated microorganisms in the chamber (4).

[0040] In another embodiment of the present invention, the light source (6) is turned on at the start of the washing process and kept open until the washing process is completed. When the washing process is completed, the light source (6) is turned off. Thus the cleaning and disinfection of the chamber (4) can also be done during the washing process.

[0041] In another embodiment of the present invention, the washing machine (1) comprises a knob (7) that allows the light source (6) to be activated by the user. When the knob (7) is triggered by the user, the light source (6) can change to the open and/or the closed position. Thus the light source (6) can be kept open by the user for as long as desired.

[0042] In yet another embodiment of the present invention, the washing machine (1) comprises one or more switches (8) that turn on the light source (6) when the cleaning agent dispenser (3) is in the chamber (4), turns off the light source (6) when the cleaning agent dispenser (3) is not in the chamber (4). This switch (8) is preferably situated between the cleaning agent dispenser (3) and the chamber (4) wherein the cleaning agent dispenser (3) is disposed, and fixed to the rear wall of the chamber (4) or the cleaning agent dispenser (3) (Figure 2 and Figure 3).

[0043] In the embodiment wherein both the knob (7) and the switch (8) are used together, when the cleaning agent dispenser (3) is in the chamber (4), the cleaning agent dispenser (3) exerts a force on this switch (8) and the light source (6) is turned on by getting to the active position. When the cleaning agent dispenser (3) is drawn out of the chamber (4) by the user, the cleaning agent dispenser (3) no longer contacts the switch (8) and the light source (6) is turned off by getting to the passive position. In

this embodiment, if the cleaning agent dispenser (3) is detached from the chamber (4) the light source (6) is not turned on even if the user triggers the knob (7). Consequently the ultraviolet rays having the wavelength that can harm the eyes of the user are prevented from being dispersed outside when the cleaning agent dispenser (3) is detached from the chamber (4) and the user is protected form harm due to the rays.

[0044] With this invention, the chamber (4) is cleaned and disinfected. Besides, by the present invention, the chamber (4) is provided with a hygienic property as well as a cleaning process.

Claims

[0001] A washing machine (1) comprising a tub (2) wherein the washing process is carried out and a chamber (4) for placing the cleaning agents and **characterized by** one or more light sources (6), partially or entirely illuminating the inside of the chamber (4) and eliminating the microorganisms in the chamber (4) by emitting ultraviolet radiation when turned on.

[0002] A washing machine (1) as in Claim 1, **characterized by** a cleaning agent dispenser (3) having at least one cubicle wherein liquid and/or powder cleaning agents are placed, to be delivered to the tub (2) and a distributor (5) disposed on the cleaning agent dispenser (3) that directs the water received from the main supply to the cleaning agent dispenser (3).

[0003] A washing machine (1) as in Claim 1 or 2, **characterized by** a light source (6) that is disposed inside the chamber (4).

[0004] A washing machine (1) as in Claim 1 or 2, **characterized by** a light source (6) that is disposed outside the chamber (4).

[0005] A washing machine (1) as in Claim 1, 3 or 4, **characterized by** a chamber (4) produced of an optically transparent or semi-transparent material.

[0006] A washing machine (1) as in Claim 2, **characterized by** a cleaning agent dispenser (3) and/or distributor (5) produced of an optically transparent or semi-transparent material.

[0007] A washing machine (1) as in any one of the above claims, **characterized by a** light carrier that is disposed between the light source (6) and the chamber (4) that provide to transmit the radiation emitted by the light source (6) into to the chamber (4) with minimum loss.

[0008] A washing machine (1) as in any one of the above claims, **characterized by** a chamber (4) that is coated with a photocatalyst material.

[0009] A washing machine (1) as in Claim 2, **characterized by** a cleaning agent dispenser and/or distributor (5) that is coated with a photocatalyst material.

[0010] A washing machine (1) as in any one of the above claims, **characterized by** a knob (7) that allows the light source (6) to be turned on by the user.

[0011] A washing machine (1) as in any one of the above claims, **characterized by** a control unit (9) that turns on or off the light source (6) at certain intervals or according to the washing program.

[0012] A washing machine (1) as in Claim 11, **characterized by** a control unit (9) that

turns on or off the light source (6) periodically while the washing program is in progress.

[0013] A washing machine (1) as in Claim 11, **characterized by** a control unit (9) that turns on the light source (6) at the start or end of each washing program for a certain time period for illuminating the chamber (4).

[0014] A washing machine (1) as in Claim 11, **characterized by** a control unit (9) that turns on the light source (6) when the number of washing programs determined by the producer is performed.

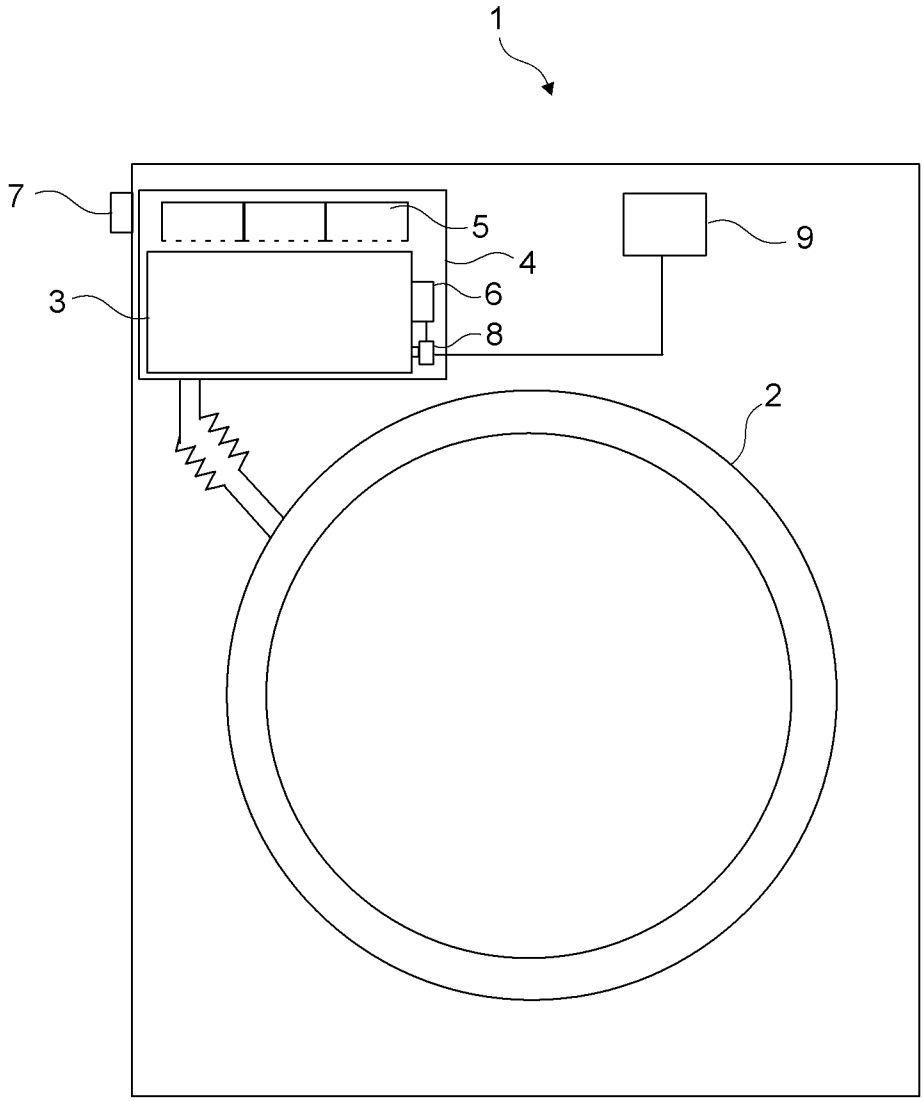
[0015] A washing machine (1) as in Claim 11, **characterized by** a control unit (9) that turns on the light source (6) when the washing program starts and keeps it open until the washing program is completed.

[0016] A washing machine (1) as in Claims 11 to 15, **characterized by** a control unit (9) that receives water into the chamber (4) when the light source (6) is turned on.

[0017] A washing machine (1) as in Claim 2, **characterized by** one or more switches (8) situated between the cleaning agent dispenser (3) and the chamber (4) wherein the cleaning agent dispenser (3) is disposed, that turn on the light source (6) when the cleaning agent dispenser (3) is in the chamber (4), and turns off the light source (6) by changing to the passive position when the cleaning agent dispenser (3) is detached from the chamber (4).

[0018] A washing machine (1) as in Claims 17, **characterized by** a switch (8) that is disposed between the rear wall of the chamber (4) and the cleaning agent dispenser (3), positioned on the rear wall of the cleaning agent dispenser (3).

[Fig.]
Figure 1



[Fig.]
Figure 2

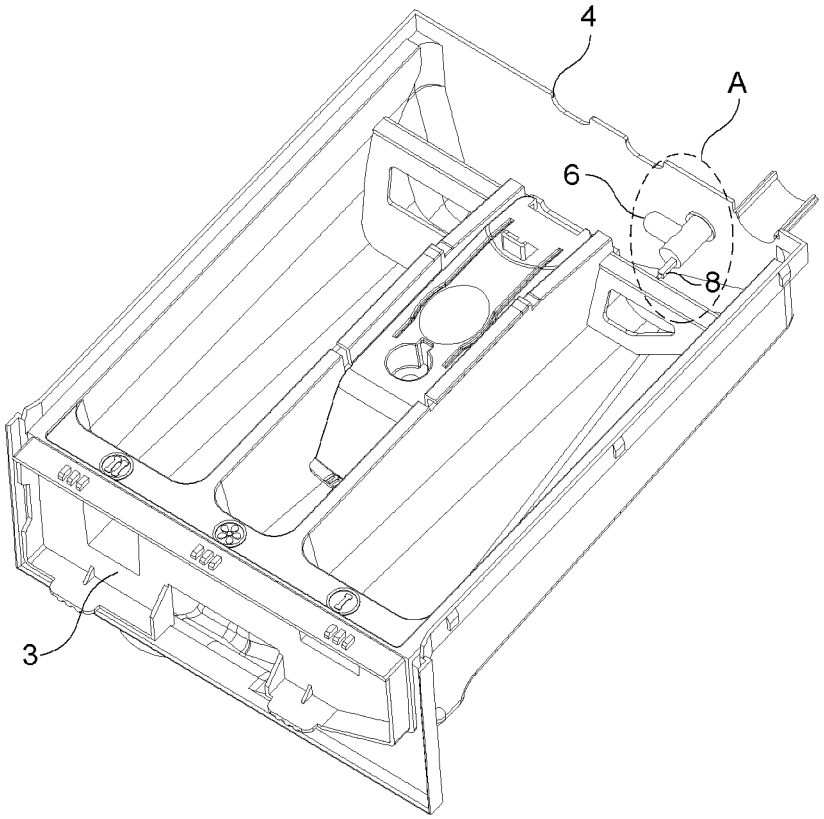


Figure 3