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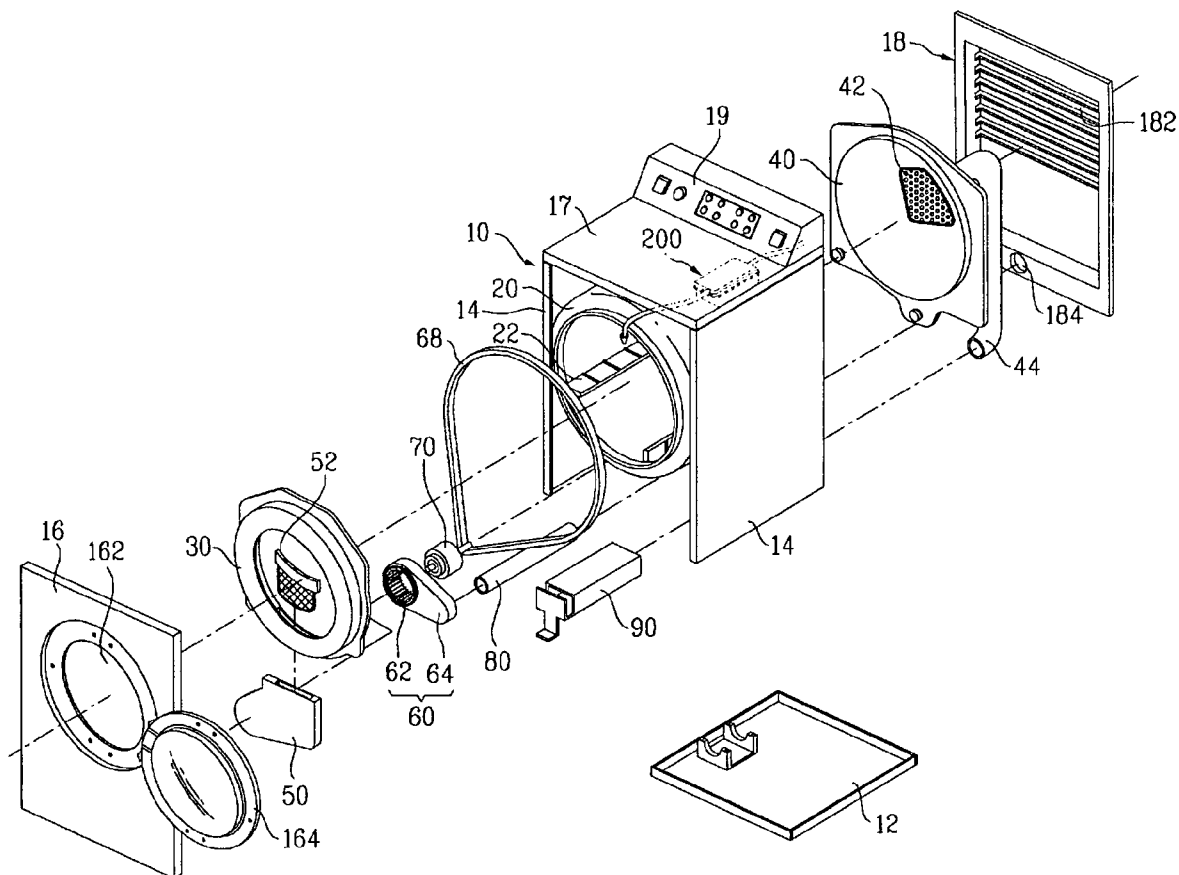
(19) **United States**(12) **Patent Application Publication**
Bae et al.(10) **Pub. No.: US 2010/0095716 A1**(43) **Pub. Date: Apr. 22, 2010**(54) **LAUNDRY MACHINE**(86) PCT No.: **PCT/KR2007/006428**(75) Inventors: **Sang Hun Bae**, Gyeongsangnam-do (KR); **Chang Woo Son**, Gyeongsangnam-do (KR); **Chul Jin Choi**, Gyeongsangnam-do (KR); **Dong Hyun Kim**, Gyeongsangnam-do (KR); **Young Bok Son**, Gyeongsangnam-do (KR); **Heung Jae Kim**, Gyeongsangnam-do (KR)§ 371 (c)(1),
(2), (4) Date:**Dec. 11, 2009**(30) **Foreign Application Priority Data**

Dec. 19, 2006 (KR) 10-2006-0129859

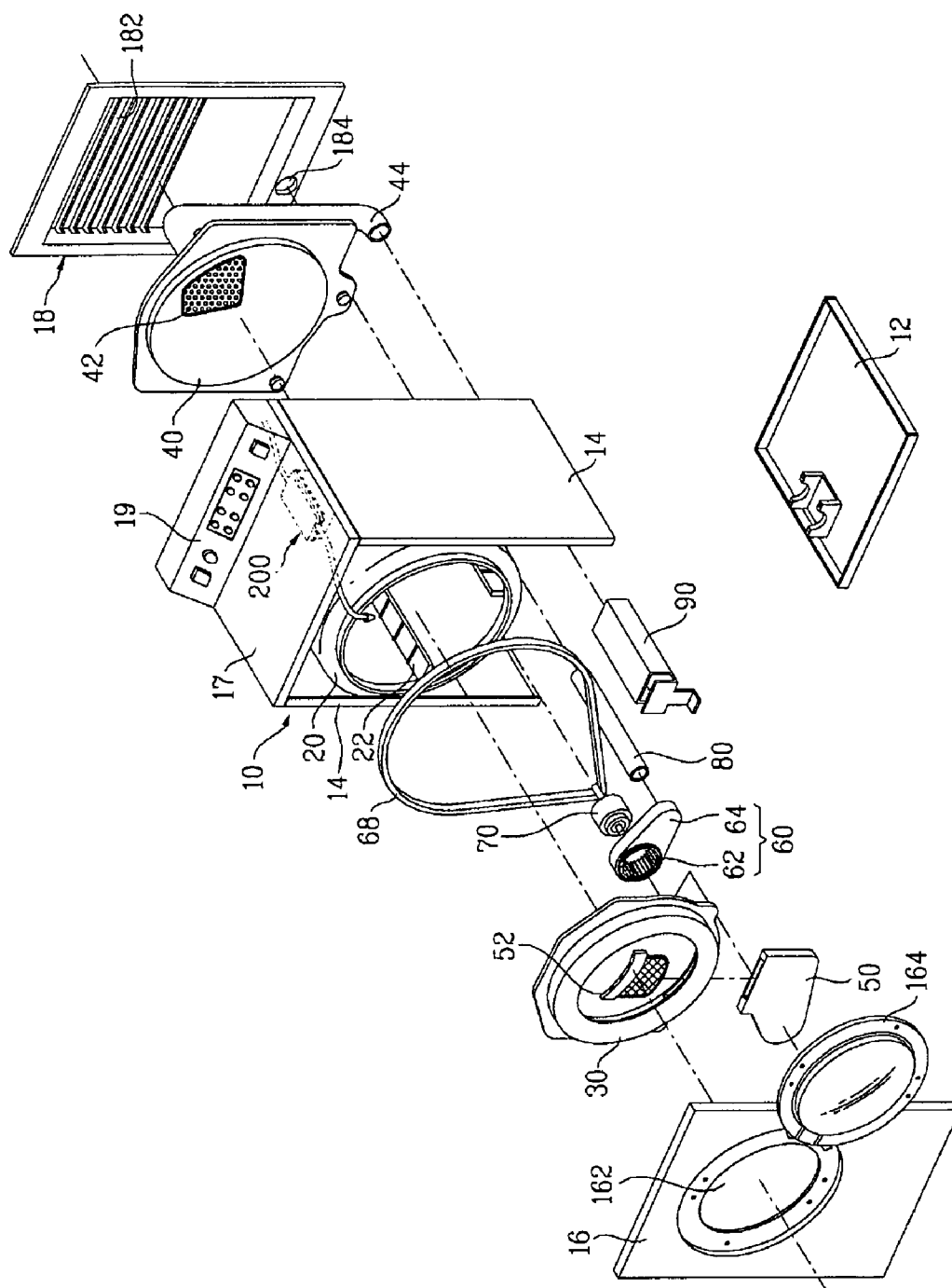
Publication Classification(51) **Int. Cl.**
D06F 37/00 (2006.01)(52) **U.S. Cl.** **68/5 R**(57) **ABSTRACT**

The present invention relates to steam dryers, and more specifically, the present invention relates to a steam dryer for removing creases or crumples from, or preventing the same from forming on, clothes. The steam dryer includes a drum (20) to be selectively rotatable; a steam generator (200) to generate steam to be supplied to the drum (20); a water container (300) to contain water to be supplied to the steam generator (200); an indicator to indicate a level of the water in the water container (300) thereby removing creases from clothes effectively.

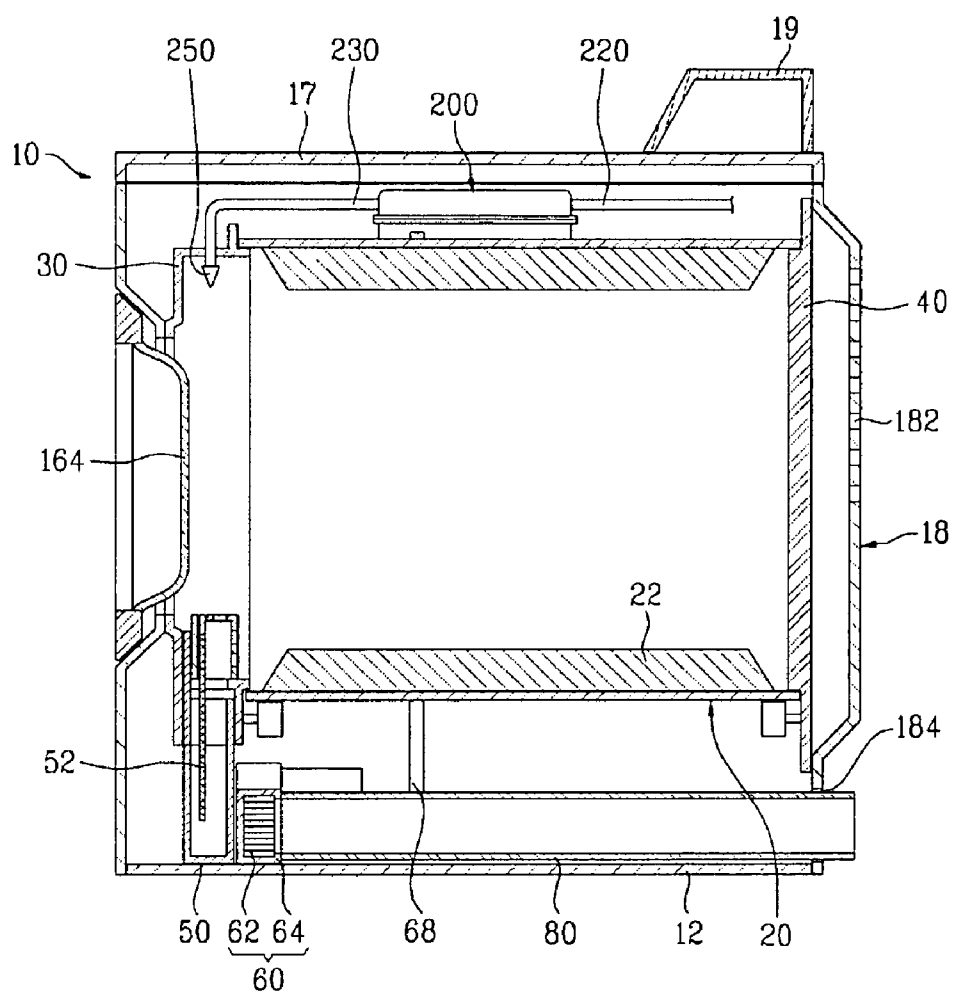
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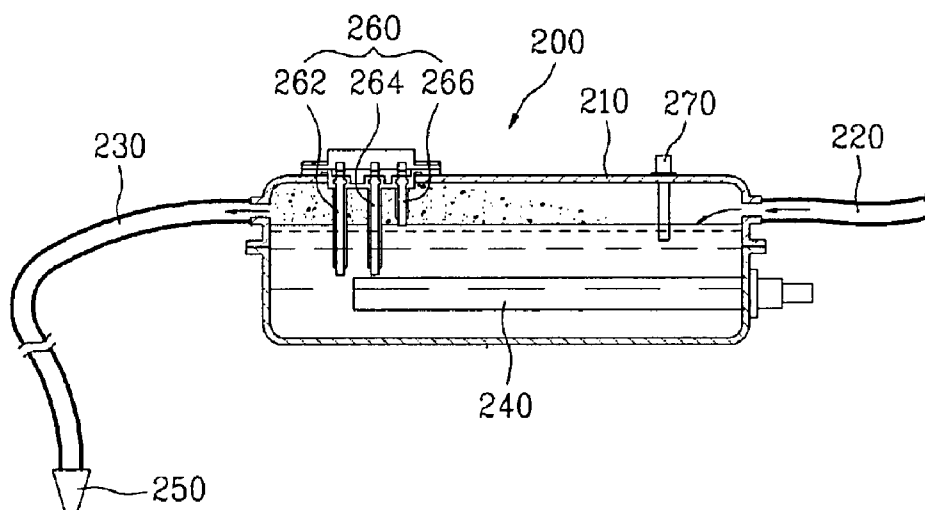
[Fig. 1]



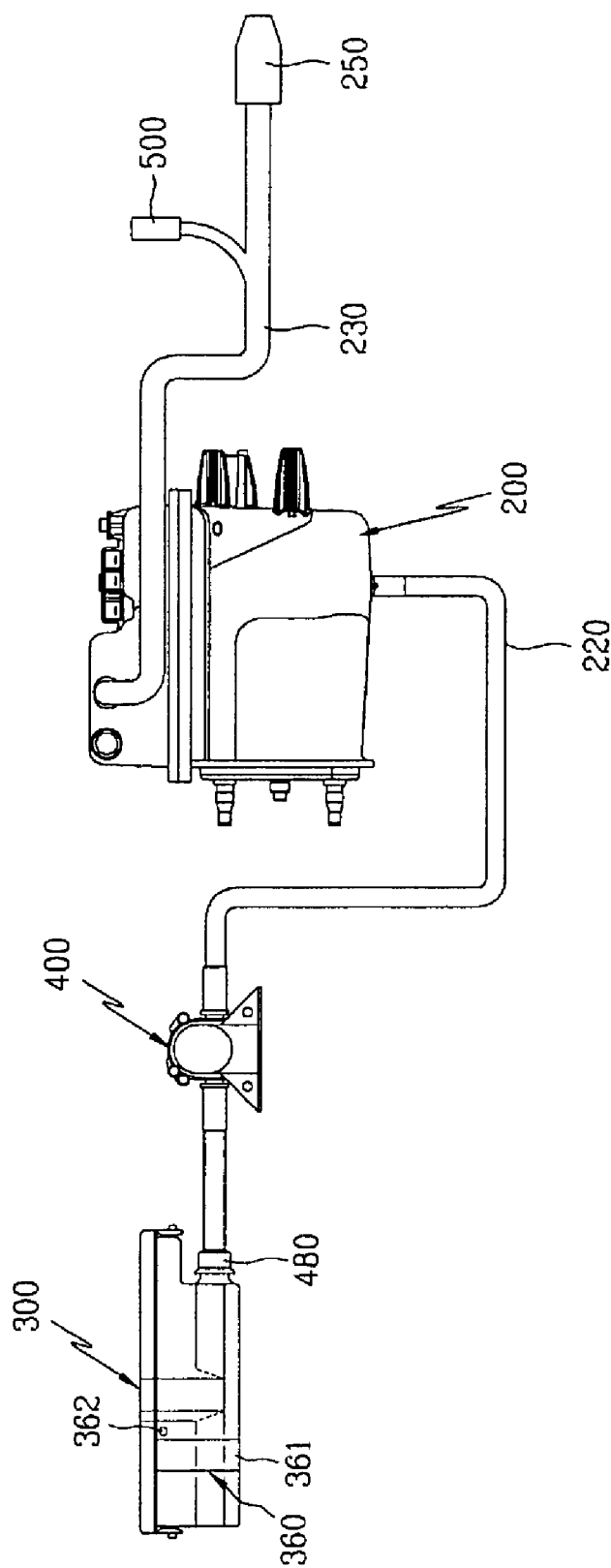
[Fig. 2]



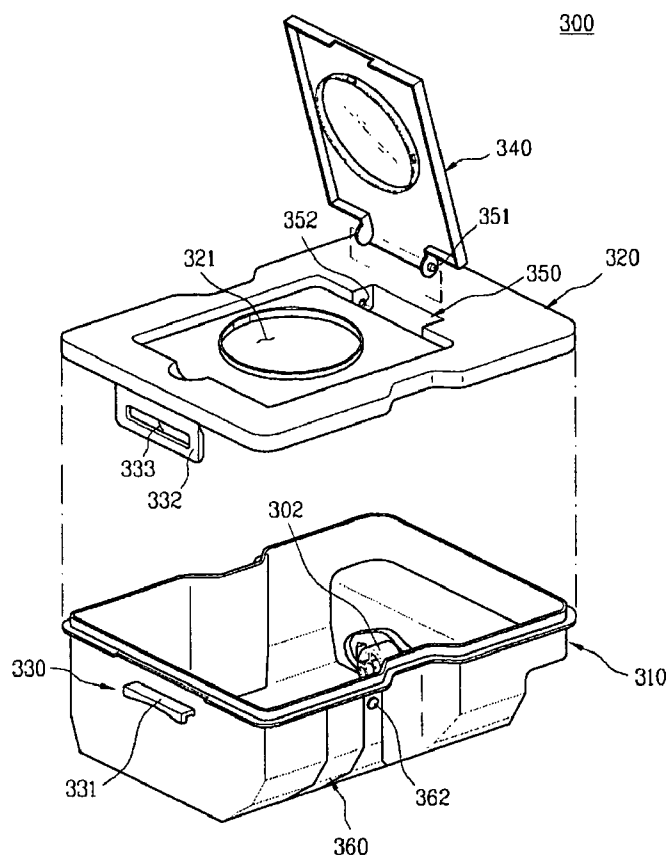
[Fig. 3]



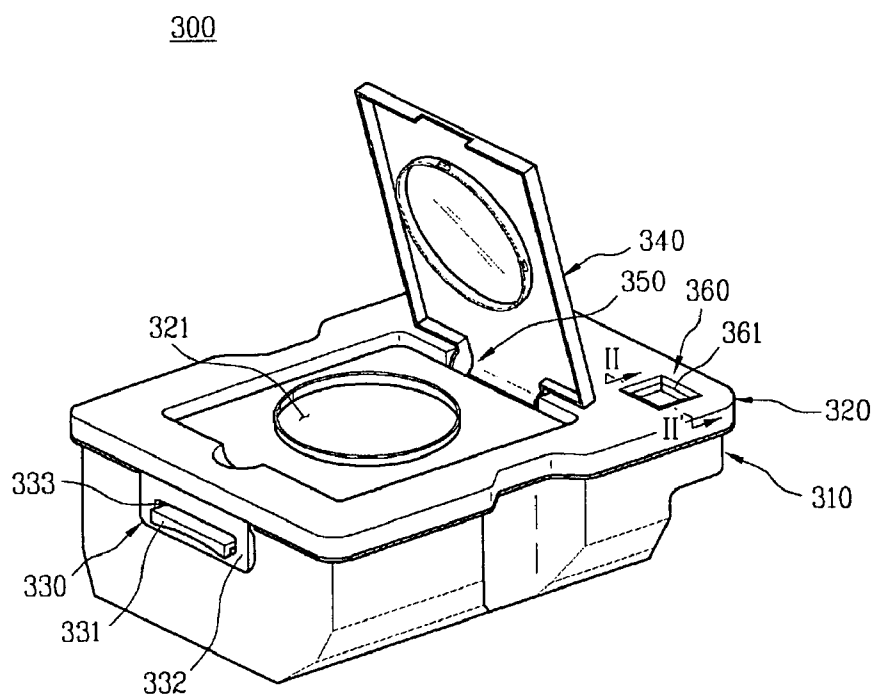
[Fig. 4]



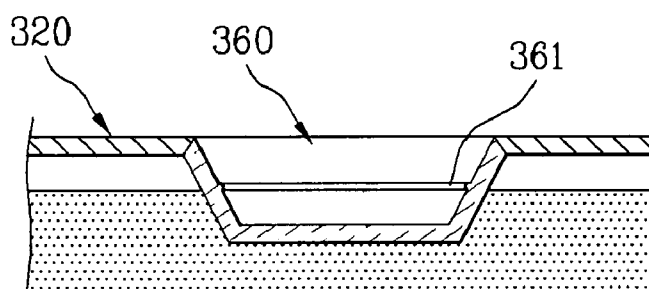
[Fig. 5]



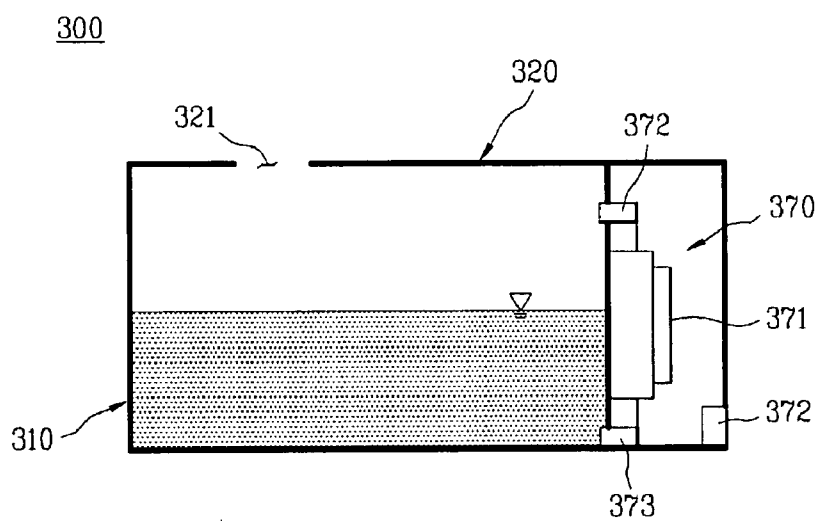
[Fig. 6]



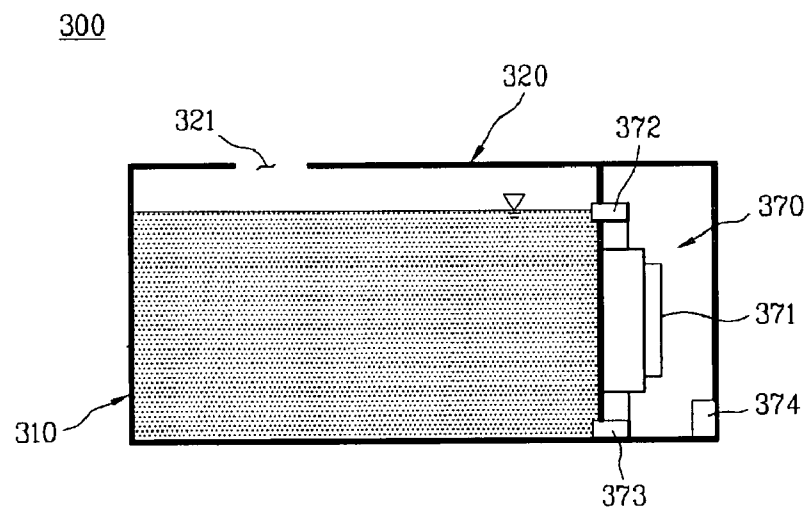
[Fig. 7]



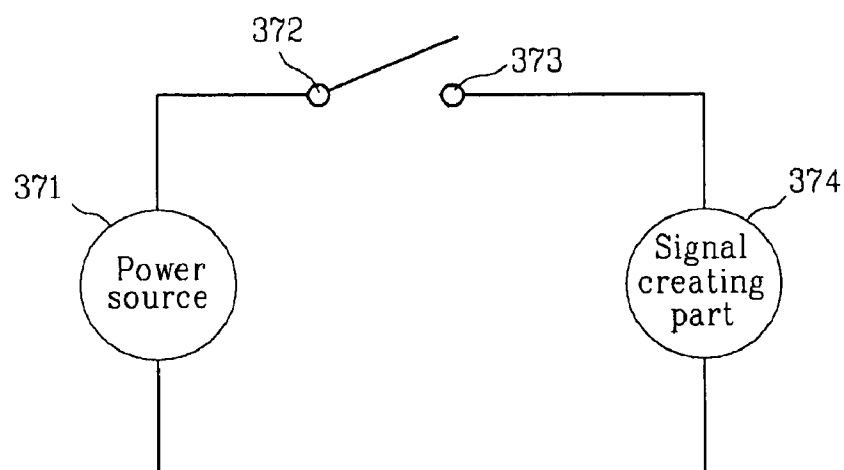
[Fig. 8]



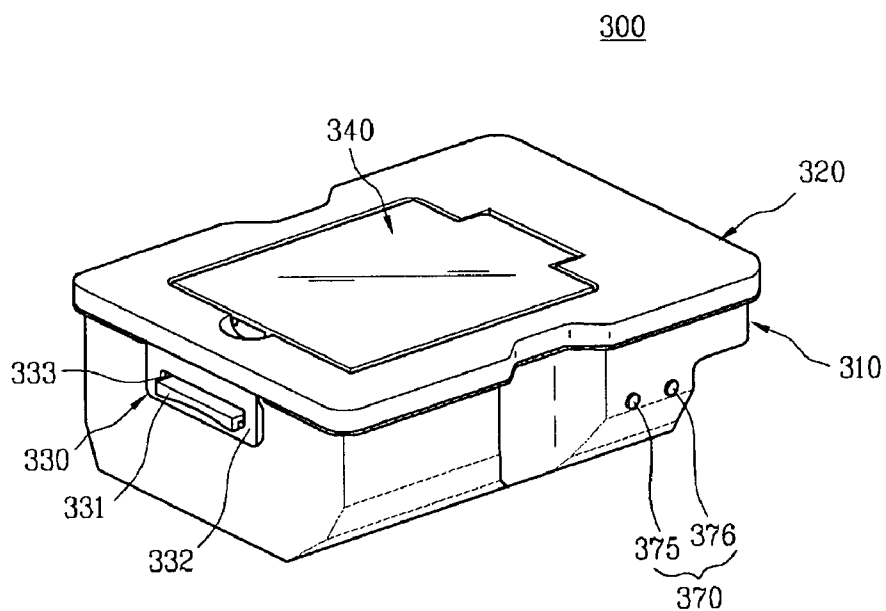
[Fig. 9]



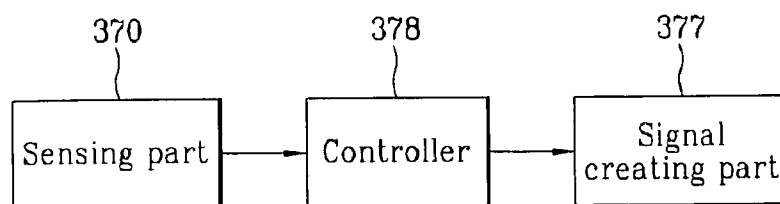
[Fig. 10]



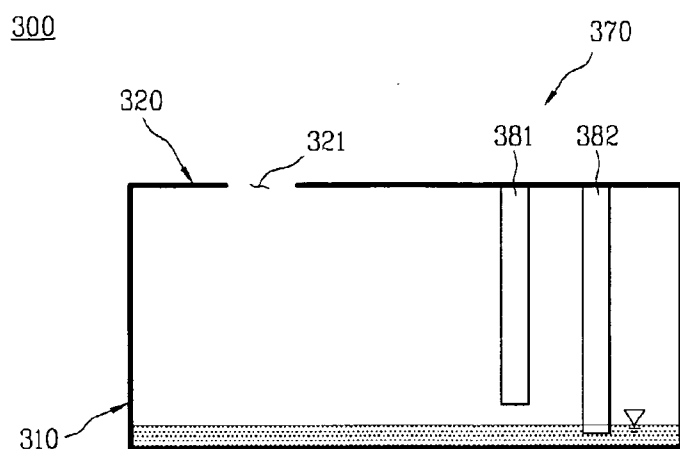
[Fig. 11]



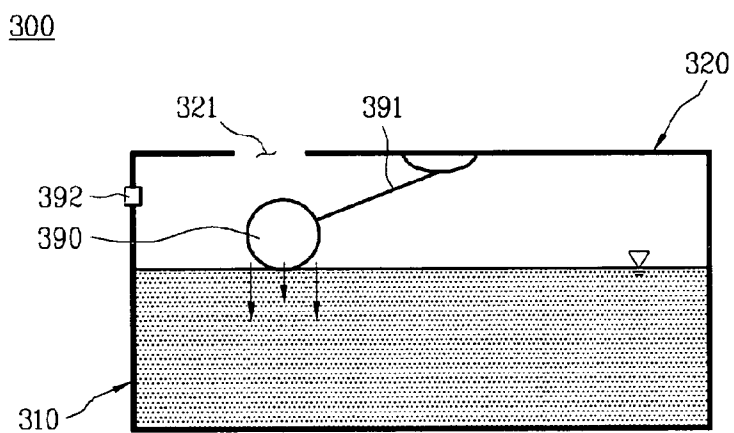
[Fig. 12]



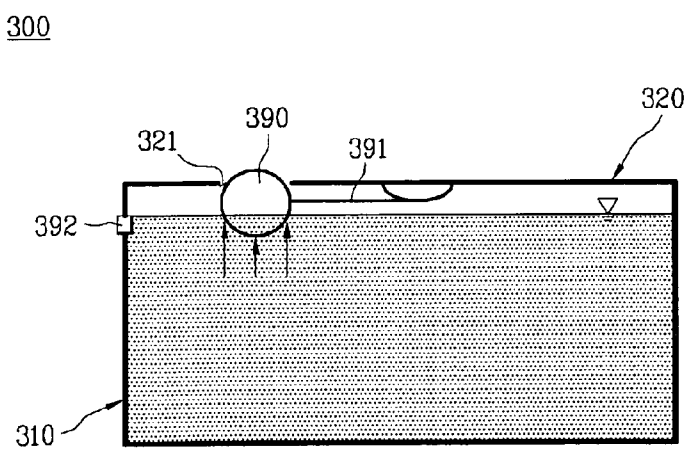
[Fig. 13]



[Fig. 14]

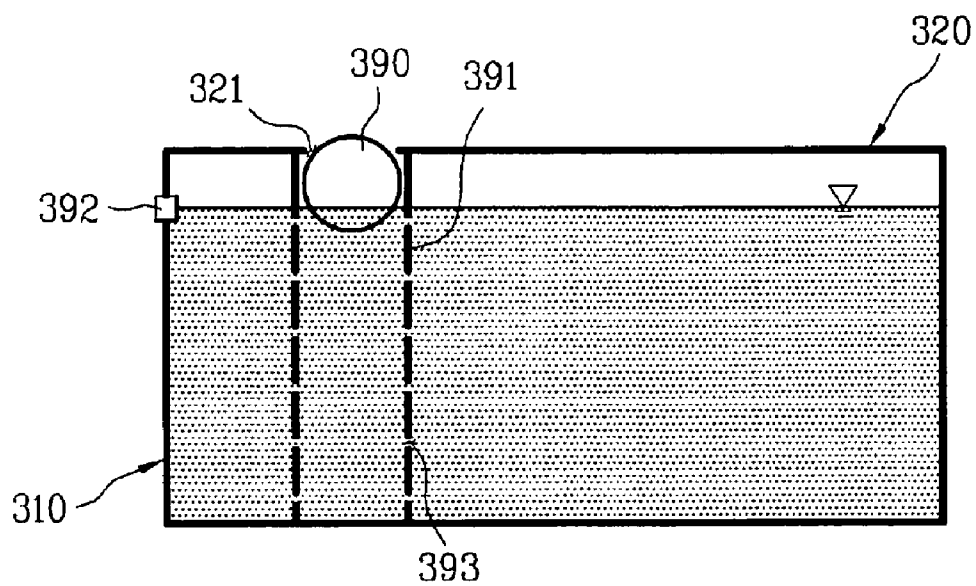


[Fig. 15]



[Fig. 16]

300



LAUNDRY MACHINE

TECHNICAL FIELD

[0001] The present invention relates to laundry machines. More specifically, the present invention relates to a laundry machine for removing creases or crumples from, or preventing the same from forming on, clothes.

BACKGROUND ART

[0002] In general, in the laundry machines, there are machines for washing, drying, or clothes. In the refreshing of the clothes, moisture, creases, crumples, static electricity, or odor is removed from the clothes, or aroma is added to the clothes.

[0003] In the laundry machines, there are washing machines and dryers, wherein the dryer is in general a home appliance for drying washed laundry, mostly clothes, with hot air. In general, the dryer is provided with a drum for holding a drying object, a driving source for driving the drum, heating means for heating the air introduced to the drum, and a blower unit for drawing or discharging the air from/to the drum.

[0004] Depending on means for heating the air, i.e., the heating means, there can be electric type dryers and gas type dryers. The electric dryer heat the air with electric resistance heat, and the gas type dryer heats the air with heat from burning the gas. The dryers may be sorted in another way, i.e., condensing type dryers, and exhaust type dryer. The condensing type dryer does not discharge the humid air heat exchanged with the drying object in the drum to an outside of the dryer, but circulates the humid air in the dryer, and makes the humid air to heat exchange with external air at a condenser provided separately to discharge condensed water formed thus to the outside of the dryer. The exhaust type dryer discharges the humid air heat exchanged with the drying object in the drum to the outside of the dryer directly. Depending on a type for introducing the laundry to the dryer, the dryer may be sorted top loading type dryers and front loading type dryers. In the top loading type dryers, the drying object is introduced to a top side of the dryer, and in the front loading type dryers, the drying object is introduced to a front of the dryer.

DISCLOSURE OF INVENTION

Technical Problem

[0005] However, the related art laundry machine has the following problems.

[0006] In general, the dryer dries washed and water extracted laundry introduced thereto. However, in view of a principle of water washing, creases are formed on the washed laundry, and the creases formed thus can not be removed perfectly in the drying process. Consequently, in order to remove the creases from the drying object, such as laundry dried in the related art dryer, additional pressing is required.

[0007] Moreover, besides the washed laundry, in a case of conventional storage, and use of clothes, creases, crumples, folds and so on (will be called as creases collectively) take place. Development of an appliance for easy removal of such creases caused by conventional storage and use of clothes has been required.

Technical Solution

[0008] To solve the problem, an object of the present invention is to provide a laundry machine which can prevent crease from forming on clothes, and/or removing the crease from the clothes.

[0009] Another object of the present invention is to provide a laundry machine which enables a user to make easy notice of a water level of water held in a water container during water supply or operation of the laundry machine.

[0010] To achieve these objects and other advantages and in accordance with the purpose of the invention, as embodied and broadly described herein, a laundry machine comprises a drum to be selectively rotatable; a steam generator to generate steam to be supplied to the drum; a water container to contain water to be supplied to the steam generator; and an indicator to indicate a level of the water in the water container.

[0011] The indicator includes a transparent part of the water container so that the water level is seen through the transparent part or a sensor to sense the water level or the water container includes a supply hole through which water is supplied, and the indicator includes a closing member to close the supply hole when the water in the water container reaches a predetermined water level.

ADVANTAGEOUS EFFECTS

[0012] The present invention has following advantageous effects.

[0013] First, the washing machine of the present invention prevents crumples or creases from forming on, or removes the same from a drying object effectively, and sterilizes the drying object or remove odor from the drying object.

[0014] Second, the washing machine of the present invention can remove crumples or creases from dried clothes without separate pressing effectively.

[0015] Third, the washing machine of the present invention permits, not only easy supply of water to the water holding unit, but also easy cleaning of the water container. Moreover, the washing machine of the present invention permits easy notice of the water level held in the water container during water supply or operation of the washing machine.

BRIEF DESCRIPTION OF THE DRAWINGS

[0016] The accompanying drawings, which are included to provide further understanding of the disclosure and are incorporated in and constitute a part of this application, illustrate embodiments of the disclosure and together with the description serve to explain the principle of the disclosure.

[0017] In the drawings:

[0018] FIG. 1 illustrates an exploded perspective view of a steam dryer in accordance with a preferred embodiment of the present invention;

[0019] FIG. 2 illustrates a longitudinal section of the steam dryer in FIG. 1;

[0020] FIG. 3 illustrates a section of the steam generator in FIG. 3;

[0021] FIG. 4 illustrates a system diagram focused on the steam generator;

[0022] FIG. 5 illustrates an exploded perspective view of a first embodiment of the water container in FIG. 4;

[0023] FIGS. 6 and 7 each illustrates a perspective view of a second embodiment of the water container in FIG. 4;

[0024] FIGS. 8 to 10 each illustrates a diagram of a third embodiment of the water container in FIG. 4;

[0025] FIGS. 11 and 12 each illustrates a diagram of a fourth embodiment of the water container in FIG. 4;

[0026] FIG. 13 illustrates a diagram of a fifth embodiment of the water container in FIG. 4;

[0027] FIGS. 14 and 15 each illustrates a diagram of a sixth embodiment of the water container in FIG. 4; and

[0028] FIG. 16 illustrates a diagram of a seventh embodiment of the water container in FIG. 4.

MODE FOR THE INVENTION

[0029] Reference will now be made in detail to the specific embodiments of the present invention, examples of which are illustrated in the accompanying drawings. Wherever possible, the same reference numbers will be used throughout the drawings to refer to the same or like parts.

[0030] In order to describe a laundry machine of the present invention, a steam dryer will be described as an embodiment of the present invention. However, the present invention is applicable to, for an example, a washing machine with steam.

[0031] Moreover, in order to described the steam dryer which is an embodiment of the present invention, a top loading, electric, condensing type steam dryer will be described as one embodiment in view of convenience of description. However, the present invention is not limited to this, but is applicable to a front loading, gas, condensing type steam dryer, too.

[0032] The steam dryer of the present invention will be described with reference to FIGS. 1 and 2.

[0033] Inside of a cabinet 10 which forms an exterior of the steam dryer, there are a rotatable drum 20, a motor 70 and a belt 68 for driving the drum 20. Mounted at a predetermined location of the cabinet 10, there are a heater 90 (will be called as hot air heater) for heating air to produce high temperature air (will be called as hot air), and a hot air supply duct 44 for supplying the hot air from the hot air heater 90 to the drum 20. And, an exhaust duct 80 for discharging humid air heat exchanged with the clothes at the drum 20 and a blower unit 60 for drawing in the humid air are also mounted. In the meantime, mounted at a predetermined location of the cabinet 10, there is a steam generator 200 for generating hot steam. For convenience sake, though the embodiment shows and describes based on an indirect drive type in which the drum 20 is rotated by using the motor 70 and the belt 68, the present invention is not limited to this. That is, the present invention is also applicable to a direct drive type in which the drum 20 is rotated directly by a motor directly connected to a rear of the drum 20.

[0034] Respective elements of the dryer will be described in detail.

[0035] The cabinet 10 which forms an exterior of the steam dryer includes a base 12 which forms a bottom of the steam dryer, one pair of side covers 14 mounted to the base 12 vertically, a front cover 16 and a rear cover 18 mounted to a front and a rear of the side covers 14 respectively, and a top cover 17 located on top of the side covers 14. A control panel 19 with various operation switches is located on the top cover 17 or the front cover 16 conventionally, and a door 164 is mounted to the front cover 16. The rear cover 18 has an inlet 182 for introduction of external air, and an exhaust hole 184 which is a final passage for discharging the air from the drum 20 to an outside of the steam dryer.

[0036] An inside space of the drum 20 serves as a drying chamber for drying the clothes, and, it is preferable that lifts

22 are provided to an inside of the drum 20 for lifting and dropping clothes, to turn the clothes upside down for enhancing drying efficiency.

[0037] In the meantime, mounted between the drum 20 and the cabinet 10 (the front cover 16 and the rear cover 18), there are a front supporter 30 and a rear supporter 40. Rotatably mounted between the front supporter 30 and the rear supporter 40, there is the drum 20, and mounted between the front supporter 30 and the rear supporter 40 and the drum 20, there are sealing members (not shown) for preventing leakage. That is, the front supporter 30 and the rear supporter 40 cover the front and rear of the drum 20 to form the drying chamber, and support the front and rear of the drum 20, respectively.

[0038] The front supporter 30 has an opening to make the drum 20 to be in communication with an outside of the dryer, which is opened/closed with the door 164 selective. The front supporter 30 also has a lint duct 50 connected thereto, which is a passage of the air from the drum 20 to an outside of the dryer, with a lint filter 52 mounted thereto. The blower unit 60 has one side connected to the lint duct 50, and the other side connected to the exhaust duct 80 which is connected to the exhaust hole 184 in the rear cover 18. Accordingly, if the blower unit 60 is in operation, the air is discharged to an outside of the dryer from the drum 20 through the lint duct 50, the exhaust duct 80, and the exhaust hole 184. In this instance, foreign matters, such as lint, are filtered at the lint filter 52. In general, the blower unit 60 includes a blower 62 and a blower housing 64, and, in general, the blower 64 is driven by the motor 70 which also drives the drum 20.

[0039] The rear supporter 40 has an opening portion 42 having, in general, a plurality of pass through holes, with the hot air supply duct 44 connected thereto. The hot air supply duct 44 is in communication with the drum 20 for serving as a passage for supplying the hot air to the drum 20. Accordingly, the hot air heater 90 is mounted to a predetermined location of the hot air supply duct 44.

[0040] In the meantime, mounted to a predetermined location of the cabinet 10, there is the steam generator 200 for generating and supplying steam to the drum 20. The steam generator 200 will be described in detail with reference to FIG. 3.

[0041] Mounted in the steam generator 200, there are a water tank 210 for holding water, a heater 240 mounted to an inside of the water tank 210, a water level sensor 260 for measuring a water level of the steam generator 200, and a temperature sensor 270 for measuring a temperature of the steam generator 200. In general, the water level sensor 260 includes a common electrode 262, a low water level electrode 264, and a high water level electrode 266 for sensing a high water level or a low water level depending on electric conduction between the common electrode 262 and the high water level electrode 264 or the common electrode 262 and the low water level electrode 266.

[0042] The steam generator 200 has one side connected to a water supply hose 220 for supplying water, and the other side connected to a steam hose 230 for discharging steam, and it is preferable that a predetermined shape of nozzle 250 is provided to a fore end of the steam hose 230.

[0043] In the meantime, though the embodiment shows and describes a steam generator 200 (will be called as a tank heating type for convenience sake) of a type in which a predetermined amount of water held in the water tank 210 is heated with the heater 240 to generate the steam, the present invention is not limited to this. That is, the present invention

can use any steam generator as far as the device can generate the steam. For an example, a configuration may also be used, in which a heater is mounted around a water supply hose through which water passes for heating the water without holding the water within a space (for convenience sake, will be called as tubular heating system).

[0044] FIG. 4 illustrates a diagram focused on a steam generator of the present invention.

[0045] The water container which supplies water to the steam generator will be described with reference to FIG. 4. Though the steam generator illustrated in FIG. 4 is different in shape from the steam generator illustrated in FIG. 3, the inventive step of the present invention is nothing to do with the shape of the steam generator, the steam generator in FIG. 4 can be the steam generator in FIG. 3, and the same reference numerals will be used.

[0046] Referring to FIG. 4, in the embodiment, the steam dryer includes a water container 300 for supplying water to the steam generator 200. It is preferable that the water container 300 is detachable. That is, it is convenient if the detachable water container 300 is detached in supplying water, and the water container 300 filled with the water is connected to the water supply flow passage of the steam generator 200, i.e., the water supply hose 220 the same as the embodiment.

[0047] It is preferable that there is a pump 400 mounted between the water container 300 and the steam generator 200. As a water outlet (not shown) of the water container 300 is placed in a connection hole 480, the pump 400 is connected to the water container 300, and is connected to the steam generator 200 with the water supply hose 220.

[0048] It is more preferable that the pump 400 is reversible, for supplying the water to the steam generator 200, and if necessary, recovering remained water from the steam generator 200. It is also possible that the water is supplied to the steam generator 200 by using a water head between the water container 300 and the steam generator 200 without using the pump. However, because, in general, components of the dryer are standard goods of compact design, there are shortages of structural spaces, absolutely. Therefore, if sizes of the components of the related art dryer are not changed, the water supply by using the water head is impossible, actually. Accordingly, as use of a small sized pump 400 enables mounting of the steam generator 200 without changing the sizes of the components, use of the pump 400 is very favorable. The remained water is recovered from the steam generator 200 for preventing the heater suffering from damage caused by the water if the steam generator 200 is left unused for a long time, and preventing use of rotten water, later.

[0049] Though the foregoing embodiment shows water supply to, and steam discharge from a top side of the steam generator 200, in the embodiment, it is preferable that the water is supplied to an underside of the steam generator 200 and the steam is discharged from the top of the steam generator 200. This configuration is favorable for recovering the remained water from the steam generator 200.

[0050] It is preferable that a safety valve 500 is provided to the steam flow passage, i.e., the steam hose 230, which discharges steam from the steam generator 200.

[0051] FIG. 5 illustrates an exploded perspective view of a first embodiment of the water container in FIG. 4.

[0052] Referring to FIG. 5, the water container 300 includes a lower housing 310 for holding water actually, and an upper housing 320 detachable from the lower housing 310. The lower housing 310 has a water discharge hole 302 at one

side of an inside for connection to the connection hole 480. There may be a filter at the water discharge hole 302.

[0053] The water container 300 with the lower housing 310 and the upper housing 320 enables easy cleaning of fur on an inside of the water container 300, and easy dismounting and cleaning of the filter. Preferably, the upper housing 320 is detachable such that one side of the lower housing 310 is opened fully. Then, the user can make easier cleaning of the inside of the water container 300.

[0054] The water container 300 has a fastening portion 330 for making the upper housing detachable from the lower housing 310. The fastening portion 330 includes an extension 332 from one side of the upper housing 320 having a hole 333 at a center, and a holder 331 projected from one side of the lower housing 310 for placing in the hole 333. As the user makes the holder 331 to be placed in the hole 333, the upper housing 320 is fastened to the lower housing 310 easily.

[0055] It is preferable that the water container 300 further includes a supply hole 321 in the upper housing 320 for supplying water, and a cover 340 for opening/closing the supply hole 321. Then, in a case water is supplied to the lower housing 310, the user can supply water to the supply hole 321 conveniently after opening the cover 340 without dismounting the upper housing 320 from the lower housing 310.

[0056] It is preferable that the water container 300 further includes a hinge portion 350 so that the cover 340 is rotatably secured to the upper housing 320. Then, the user can make easier opening/closing of the supply hole 321 by rotating the cover 340. The hinge portion 350 may include one pair of hinge shafts 351 projected outwardly from one side of opposite sides of the cover 340 respectively, and hinge holes 352 in the upper housing 320 such that the one pair of the hinge shafts 351 are rotatably placed therein.

[0057] It is preferable that the steam dryer of the present invention include an indicator for indicating a water level of the water in the lower housing 310. Then, the user can notice the water level of the water in the lower housing 310, to supply an appropriate amount of water to the lower housing 310. In this instance, the appropriate amount is an amount of water that can be filled in the water container 300, i.e., an amount of water that can be received by the lower housing 310, which varies with a capacity of the steam generator, or a size of the water container 300.

[0058] In the embodiment, the indicator includes a transparent part 360 of the water container 300 so that the water level is seen through the transparent part 360.

[0059] The transparent part 360 may be formed in a height direction of the water container 300, i.e., the lower housing 310 at a side thereof. It is preferable that the transparent part 360 is formed of a transparent material. Then, when the user supplies water to the lower housing 310, the user can make easy notice of the water level being filled in the lower housing 310 with the transparent part 360. More preferably, the transparent part 360 may further include a color varying material that varies a color thereof with a temperature. Then, since the color varying material varies a color thereof with a temperature of the water as the water is being filled in the lower housing 310, the user can make easy notice of the water level being filled in the lower housing 310.

[0060] It is preferable that the water container 300 further include an indicating line 361 that indicates the water is filled up to the appropriate water level of the lower housing 310 at the time the water supplied to the water container 300. In this instance, the appropriate water level is a water level when an

appropriate amount of water that can be held in the lower housing 310, i.e., an appropriate amount, is filled, which can vary with the capacity of the steam generator, or the size of the water container 300. According to this, when the water is supplied to the water container 300, the user can control such that the appropriate amount of water is supplied to the lower housing 310 by means of the transparent part 360 and the indicating line 361. The indicating line 361 may be formed on the transparent part 360 or on the lower housing 360 in the vicinity of the transparent part 360. Preferably, the indicating line 361 may include a plurality of gradation lines for indicating, not only the appropriate water level of the lower housing 310, but also indicating the water level in detail.

[0061] FIG. 6 illustrates a perspective view of a second embodiment of the water container in FIG. 4, and FIG. 7 illustrates a section across a line II-II in FIG. 6, showing the water filled up to the appropriate level of the lower housing 310, schematically. Since the water container 300 of the second embodiment is different from the foregoing embodiment only in the transparent part 360, reference numerals and description of the second embodiment on portions other than the indicator 360 will be the same with the foregoing embodiment.

[0062] The transparent part 360 of the embodiment is formed on one side of an upper surface of the water container 300, i.e., one side of an upper surface of the upper housing 320. It is preferable that the transparent part 360 is formed of a transparent material. Then, the user can make easy notice of the water level being filled in the lower housing 310. Particularly, in general, the user supplies the water to the water container 300, standing on a floor, when the user can make easy notice of the water level being filled in the water container 300 even in the standing state as the transparent part 360 is formed in the upper surface of the water container 300. That is, if the transparent part 360 is formed at the side of the water container 300 the same as the embodiment shown in FIG. 5, though there is inconvenience of the user to bend body to notice the water level, the embodiment enables the user to notice the water level being filled in the water container 300 even in the standing state.

[0063] Preferably, the transparent part 360 may be recessed. More preferably, the transparent part 360 may be recessed such that a width thereof becomes the smaller as the recess goes the deeper. Then, the user can make easier notice of the water level being filled in the water container 300 in the standing state. That is, if the transparent part 360 is recessed down with a fixed width, the user can not make easy notice of the water level when the user looks down the transparent part 360 right over the transparent part 360. But, if the width of the water container 300 becomes the smaller as shown in FIG. 7, the user can make easy notice of the water level when the user looks down the transparent part 360 right over the transparent part 360. In this instance, the indicating line 361 that indicates the appropriate water level of the lower housing 310 can be formed around the transparent part 360.

[0064] It is preferable that the transparent part 360 further includes a color varying member that varies a color with a temperature. Then, since the color varying member varies a color thereof with a temperature of the water as the water is being filled in the lower housing 310, the user can make easy notice of the water level being filled in the lower housing 310. In this instance, the color varying member may further included only to a bottom surface of the lower housing 310. In this case, it is preferable that the indicator 363 is recessed

down to the appropriate water level of the lower housing 310. Then, if the water is filled to the appropriate water level of the lower housing 310, filling up the water to the bottom surface of the lower housing, the color of the color varying member can be varied. Accordingly, by noticing the varied color of the color varying member, the user can make easy notice of the water filled up to the appropriate water level of the lower housing 310. In this case, formation of the indicating line 361 is not required, as the color varying member serves as the indicating line 361.

[0065] FIGS. 8 to 10 each illustrates a diagram of a third embodiment of the water container in FIG. 4, wherein FIG. 8 illustrates a state the water is not filled up to the appropriate water level of the water container schematically, FIG. 9 illustrates a state the water is filled up to the appropriate water level of the water container schematically, and FIG. 10 illustrates a circuit diagram of a sensor, schematically. Since the water container 300 of the third embodiment is different from the foregoing embodiment only in that the sensor 370 is provided instead of the transparent part 360 in the first and second embodiment, reference numerals and description of the first and second embodiment on portions other than the transparent part 360 will be the same with the second embodiment.

[0066] The indicator of the embodiment includes a sensor 370 for sensing the water level of the lower housing 310. The sensor 370 includes a power source unit 371 provided to a predetermined location of the lower housing 310, and a first electrode 372 and a second electrode 373 connected to the power source unit 371. It is preferable that the first electrode 372 and the second electrode 373 is spaced from each other such that the first electrode 372 and the second electrode 373 are connected to the water located to water levels of the lower housing 310 different from each other.

[0067] In the embodiment, the first electrode 372 is connected to the water located at a higher water level than the second electrode 373. Of course, the second electrode 373 may be connected to the water located at a higher water level than the first electrode 372. Then, as shown in FIG. 9, if the water filled in the lower housing 310 reaches to the water level connected to the first electrode 372, a minute current flows between the first electrode 372 and the second electrode 373 through the water filled in the lower housing 310, to make the sensor 370 in conduction.

[0068] It is preferable that the indicator of the embodiment further includes a signal creating part 374 for creating a predetermined signal once the sensor 370 becomes in conduction. As shown in FIG. 10, if the water level of the water held in the lower housing 310 reaches to the water level, the current flows to the signal creating part 374 as the first electrode 372 and the second electrode 373 are in conduction, and according to this, the signal creating part 374 can create a predetermined signal.

[0069] According to this, if the water being filled in the lower housing 310 reaches to the water level connected to the first electrode 372, the user can make easy notice of the signal from the signal creating part 374.

[0070] Preferably, the first electrode 372 may be mounted so as to be connected to the water located at the appropriate water level of the lower housing 310, and the second electrode 373 may be mounted so as to be connected to the water located under the appropriate water level. Then, when the water is supplied to the lower housing 310, the user can make

easy notice of the water being filled to the appropriate water level of the lower housing 310 by means of the signal creating part 374.

[0071] Accordingly, it is convenient as the user supplies the water to the lower housing 310 no more with reference to the signal from the signal creating part 374 in the middle of supply of the water to the lower housing 310. It is preferable that the signal creating part 374 creates a signal of sound or a light so that the user can notice easily.

[0072] The first electrode 372 and the second electrode 372 may be mounted so to be spaced from each other and connected to the water located at the same water level of the lower housing 310. In this case, if the water is filled in the lower housing 310 up to a water level connected to the first electrode 372 and the second electrode 373, the first electrode 372 and the second electrode 373 can be in conduction with each other. It is preferable that the first electrode 372 and the second electrode 373 are mounted so as to be connected to the water located to the appropriate water level of the lower housing 310.

[0073] FIGS. 11 and 12 each illustrates a diagram of a fourth embodiment of the water container in FIG. 4, wherein FIG. 11 illustrates a perspective view of the water container, and FIG. 12 illustrates a block diagram of the embodiment. Since the steam dryer of the fourth embodiment is different from the foregoing embodiment only in the sensor 370, reference numerals and description of the fourth embodiment on portions other than the sensor 370 will be the same with the foregoing embodiment.

[0074] The sensor 370 of the embodiment may include a first electrode 375 and a second electrode 376 mounted to one side of the lower housing 310 so as to be connected to the power source unit (not shown) of the steam dryer when the water container 300 is mounted to the steam dryer. That is, the embodiment can have a simpler water container structure in that the power source unit 371 shown in FIG. 8 is not included, but the power source unit (not shown) of the steam dryer is used.

[0075] The first electrode 375 and the second electrode 376 may be mounted so as to be spaced from each other and connected to the water located at the same water level, or different water levels of the lower housing 310. It is preferable that the water level is below the appropriate water level of the lower housing 310. Then, if the cartridge 300 is mounted to the steam generator body after the water is filled up to the appropriate water level of the lower housing 310, connecting the first electrode 375 and the second electrode 376 to the power source unit (not shown) of the steam generator body, the first electrode 375 and the second electrode 376 can be in conduction with each other, making the sensor 370 in conduction. Thereafter, if the water level of the lower housing 300 drops down below the water level where the first electrode 375 or the second electrode 376 is connected thereto, the first electrode 375 and the second electrode 376 will be in conduction with each other no more, making the sensor 370 in conduction no more.

[0076] Preferably, a signal creating part 377 can further be included, which creates a predetermined signal if the sensor 370 is in conduction no more. It is preferable that this is carried out by a controller 378 in the steam dryer. That is, as shown in FIG. 12, it can be made possible by making the controller 378 of the steam dryer to sense the sensor 370 not in conduction no more, and to make the signal creating part 377 to create the predetermined signal, if the sensor 370 is in

conduction no more. Then, the user can make easy notice of the water level in the lower housing 310 reaches up to the water level connected to the first electrode 375 or the second electrode 376 during operation of the steam dryer. It is preferable that the signal creating part 377 creates a signal of sound or a light so that the user can notice easily.

[0077] It is preferable that both of the first electrode 375 and the second electrode 376 are mounted so as to be connected to the water at an insufficient water level, or at least one of the first electrode 375 and the second electrode 376 is mounted so as to be connected to the water at the insufficient water level. Then, the user can notice that the water held in the lower housing 310 drops to the insufficient water level by means of the signal creating part 377 during operation of the steam dryer easily, and supply the water to the lower housing 310 accordingly.

[0078] In this instance, the insufficient water level is a water level at which the water held in the lower housing 310 is in shortage, and can vary with a capacity of the steam dryer, or a size of the water container 300, or design at the time of manufacture. Preferably, the insufficient water level may be set as a predetermined height from a bottom surface of the lower housing 310. Then, the user can notice that the water is in shortage before the water level of the water in the lower housing 310 drops down to the bottom surface, and supply the water to the water container 300. It is preferable that the signal creating part 377 keeps creating the signal until the user separates the water container 300 for supplying the water to the lower housing 310, or creates the signal periodically for a predetermined time period.

[0079] FIG. 13 illustrates a diagram of a fifth embodiment of the water container in FIG. 4. Since the water container 300 of the fifth embodiment is different from the foregoing embodiment only in that the sensor 370 of the fifth embodiment further includes a first stick 381 and a second stick 382, reference numerals and description of the fifth embodiment on portions other than the first stick 381 and the second stick 382 will be the same with the foregoing embodiment.

[0080] The sensor 370 of the embodiment may further include the first stick 381 connected to the first electrode 375 and the second stick 382 connected to the second electrode 376. The first stick 381 has a length enough to reach to the insufficient water level of the lower housing 310 from the upper housing 320 and is secured to the upper housing 320, and the second stick 382 has a length longer than the first stick 381, and is secured to the upper housing 320.

[0081] Then, if the water level of the water in the lower housing 310 is higher than the insufficient water level, the first stick 381 and the second stick 382 become in conduction with each other by the water, to let the first electrode 375 and the second electrode 376 in conduction. As shown in FIG. 13, if the water level is lower than the insufficient water level, to let the first stick 381 and the second stick 392 not in conduction, the first electrode 375 and the second electrode 376 are not in conduction, leading the signal creating part 377 to create the signal for the user to notice.

[0082] The embodiment has an advantage in that mounting locations of the first electrode 375 and the second electrode 376 are restricted less than before by the inclusion of the first stick 381 and the second stick 382. That is, the first electrode 375 and the second electrode 376 can be mounted to an upper portion or a lower portion of the lower housing 310 because the first electrode 375 and the second electrode 376 can work as far as the first electrode 375 and the second electrode 376

are conductive with the first stick **381** and the second stick **382** elongated in the height direction of the lower housing **310**. This is convenient when the first electrode **375** and the second electrode **376** are connected to the power source of the steam dryer body when the water container is mounted to the steam dryer body.

[0083] FIGS. **14** and **15** each illustrates a diagram of a sixth embodiment of the water container in FIG. **4**, wherein FIG. **14** illustrates a diagram showing the water is not filled to the appropriate water level of the water container schematically, and FIG. **15** illustrates a diagram showing the water is filled to the appropriate water level of the water container schematically. Since the steam dryer of the sixth embodiment is different from the foregoing embodiment only in that the indicator includes a closing member to close the supply hole **321** instead of the transparent part of the first embodiment, reference numerals and description of the sixth embodiment on portions other than the closing member will be the same with the first embodiment.

[0084] The indicator of the embodiment includes a closing member that closes the supply hole **321**. Then, the user can make easy filling of the water up to the appropriate water level.

[0085] It is preferable that the closing member is a movable member **390** that moves with the water level of the water being filled in the lower housing **310**. Then, as the movable member **390** moves along with the water level being filled in the lower housing **310**, the movable member **390** can close the supply hole **321** easily. More preferably, the movable member **390** may be constructed of a material that can float on the water. For an example, the movable member **390** may be constructed of a predetermined buoy. According to this, as the water is filled in the lower housing **310**, the movable member **390** moves upward following the water level of the water being filled in the lower housing **310**. Opposite to this, if the water is reduced in the lower housing **310**, the movable member **390** moves down.

[0086] It is preferable that the steam dryer further includes a guide portion **391** for guiding the movement of the movable member **390**. The guide portion **391** has one side secured to an underside of the upper housing **320**, and the other side connected to the movable member **390**. The guide portion **391** is rotatable by a predetermined angle following up/down movement of the movable member **390**, so that the movable member **390** moves in up/down direction following the movement of the guide portion **391** as the water is filled in the lower housing **310**.

[0087] Referring to FIG. **15**, preferably, the guide portion **391** may be constructed such that the movable member **390** closes the supply hole **321** if the water is filled up to the appropriate level **392** of the lower housing **310**. Then, it is very convenient as, when the user supplies the water to the lower housing **310**, the water is filled in the lower housing **310** no more automatically once the water is filled up to the appropriate level **392** of the lower housing **310**.

[0088] FIG. **16** illustrates a diagram of a seventh embodiment of the water container in FIG. **4**, showing the water filled up to the appropriate level of the water container. Since the steam dryer of the seventh embodiment is different from the foregoing embodiment only in the guide portion **391**, reference numerals and description of the seventh embodiment on portions other than the guide portion **391** will be the same with the foregoing embodiment.

[0089] The steam dryer of the embodiment may include a guide portion **391** fixed in a height direction in the lower housing **310** with the movable member **390** placed therein. It is preferable that the guide portion **391** has a plurality of openings **393** for inflow of the water. Then, as the water is filled in the lower housing **310**, the water can flow into the guide portion **391**. According to this, as the water is filled in the lower housing **310**, the movable member **390** in the guide portion may move in up/down directions.

[0090] Preferably, the guide portion **391** may be mounted such that the movable member **390** moves in the up/down directions under the supply hole **321**. Then, if the water is filled up to the appropriate level **392** of the lower housing **310**, the movable member **390** closes the supply hole **321**, preventing the water from flowing into the lower housing **310** no more. According to this, it is very convenient because, when the user supplies water to the lower housing **310**, the water is not filled in the lower housing **310** once the water is filled up to the appropriate water level **392** of the lower housing **310**.

INDUSTRIAL APPLICABILITY

[0091] As has been described, the present invention has the following advantages.

[0092] First, the washing machine of the present invention prevents crumples or creases from forming on, or removes the same from a dried drying object effectively, and sterilizes the drying object or remove odor from the drying object.

[0093] Second, the washing machine of the present invention can remove crumples or creases from dried clothes without separate pressing effectively.

[0094] Third, the washing machine of the present invention permits, not only easy supply of water to the waster holding unit, but also easy cleaning of the water container. Moreover, the washing machine of the present invention permits easy notice of the water level held in the water container during water supply or operation of the washing machine.

1. A laundry machine comprising:

- a drum to be selectively rotatable;
- a steam generator to generate steam to be supplied to the drum;
- a water container to contain water to be supplied to the steam generator; and
- an indicator to indicate a level of the water in the water container.

2. The laundry machine as claimed in claim 1, wherein the indicator includes a transparent part of the water container so that the water level is seen through the transparent part.

3. The laundry machine as claimed in claim 2, wherein the transparent part is located at a top of the water container.

4. The laundry machine as claimed in claim 2, wherein the indicator includes a color varying member a color of which varies according to temperature.

5. The laundry machine as claimed in claim 4, wherein the indicator is located at a side of the water container.

6. The laundry machine as claimed in claim 3, wherein the transparent part is configured to be recessed down such that the further down, a width thereof becomes the smaller.

7. The laundry machine as claimed in claim 6, wherein the indicator includes a color varying member located at a bottom of the transparent part, a color of the color varying member varies according to temperature.

8. The laundry machine as claimed in claim 1, wherein the indicator includes a sensor to sense the water level.

9. The laundry machine as claimed in claim 8, wherein the indicator further includes a signal creating part to create a signal as the sensor senses a predetermined water level.

10. The laundry machine as claimed in claim 9, wherein the sensor includes a first electrode and a second electrode, and senses the water level as the electrodes are electrically connected by water.

11. The laundry machine as claimed in claim 10, further comprises a separate power source provided to the water container to supply electrical power to the indicator.

12. The laundry machine as claimed in claim 10, wherein the indicator is connected to a power source of the laundry machine.

13. The laundry machine as claimed in claim 10, wherein the first electrode and the second electrode are spaced from each other and mounted so as to be connected to the water located at the same water level of the water container.

14. The laundry machine as claimed in claim 10, wherein the first electrode and the second electrode are spaced from

each other and mounted so as to be connected to the water located at different water levels of the water container.

15. The laundry machine as claimed in claim 1, wherein the water container includes a supply hole through which water is supplied, and wherein the indicator includes a closing member to close the supply hole when the water in the water container reaches a predetermined water level.

16. The laundry machine as claimed in claim 15, wherein the closing member includes a movable member to move as the water reaches the predetermined water level.

17. The laundry machine as claimed in claim 16, wherein the movable member includes a member floatable on the water.

18. The laundry machine as claimed in claim 17, further comprising a guide portion to guide the movable member to close the supply hole.

19. The laundry machine as claimed in claim 1, wherein the water container is detachable.

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