(54) Title: LAUNDRY DEVICE AND METHOD FOR CONTROLLING THE SAME

(57) Abstract: Disclosed hereinafter is a laundry device. More particularly, a washing machine comprises a steam generation unit (150) installed therein to generate and supply steam to an outside of the washing machine or to laundry-receiving device (500) to remove wrinkles on laundry by using the steam supplied from the steam generation unit (150), and a method for controlling operation thereof. A method for controlling the washing machine is also disclosed. The washing machine comprises a steam generation unit (150) to generate steam, and an steam outside-supplying pipe (180) connected with the steam generation unit to supply the steam to an outside of the washing machine.
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Description

LAUNDRY DEVICE AND METHOD FOR CONTROLLING THE SAME

Technical Field

[1] The present invention relates to a laundry device, and more particularly, to a washing machine which comprises a steam generation unit installed therein to generate and supply steam to an outside of the washing machine or to a laundry-receiving device to remove wrinkles on laundry using the steam supplied from the steam generation unit, and a method for controlling the same.

Background Art

[2] Generally, a washing apparatus is an apparatus to perform various operations related to laundry, and includes a washing machine to wash the laundry, a drying machine to dry wet laundry, and the like.

[3] The drying machine has a problem in that, since it is operated in a state wherein various kinds of laundry are collectively input thereto, entangled laundry cannot be efficiently dried.

[4] In addition, when laundry is stored for a long period of time in such a conventional drying machine, wrinkles are severely created on the clothes, inevitably causing inconvenience of ironing. Thus, it is impossible for the conventional drying machine to store the laundry therein.


[6] The combination type drying machine as described above is a drying apparatus, which is constituted by combining a general drum type drying machine having a rotational drum, and a drying cabinet mounted on the drying machine such that hot wind is supplied thereto, and having a space for receiving various kinds of laundry.

[7] The drying cabinet is supplied with hot wind from the drum type drying machine, and uses the hot wind to dry or store the laundry therein for a long period of time.

[8] However, since the drying cabinet of the combination type drying machine is mounted on the drum type drying machine, it is necessary to limit the height of the drying cabinet. Thus, it is difficult for the drying cabinet to receive the laundry in a
hung state, as such the drying cabinet must be implemented using shelves.

[9] Of course, the drum type drying machine described above is provided with a separate space to receive long laundry.

[10] However, since the space must be formed in such a manner that the space is depressed into an inner space at one side of the drum type drying machine, the drum type drying machine has a problem in that it has a substantially increased width in a longitudinal direction.

[11] In addition, since typical drum type washing machines (for example, drum type washing machine, a drum type drying machine, etc.) have a low height, they are used with its bottom supported by a separate support.

[12] However, in this case, the space of the washing machine is wasted by a height of the support.

[13] Of course, it has been suggested in the prior art to employ an inner space of the support as an accommodation space.

[14] However, since the accommodation space is not frequently used, it has a low effectiveness.

[15] In addition, an apparatus has not been developed in the prior art, which can realize a water washing effect for previously worn clothes via a simple operation course even when washing the once worn clothes without using water. Thus, if a user wants to wear neat laundry, it is necessary to iron the laundry, causing inconvenience and the user to be dissatisfied. If the laundry is dried in the conventional drying machine, the laundry is seriously wrinkled in the drying machine, thereby requiring troublesome ironing operation on the laundry.

[16] Furthermore, in the prior art, there is no such an apparatus which employs steam in order to realize the water washing effect for the once worn clothes.

[17] Thus, there is a need to provide an apparatus, which can perform water washing in the case where the laundry are very dirty, and can realize the water washing effect via a simple operation course using the steam in the case where the laundry is not seriously soiled and do not require the water washing.

**Disclosure of Invention**

**Technical Problem**

[18] An object of the present invention devised to solve the problem lies on an improved washing machine, which employs steam to remove wrinkles on laundry while providing sterilization effect to the laundry.
Another object of the present invention is to provide the washing machine, which comprises a refresh part only to perform refresh operation for the laundry, and selectively supplies the steam to the refresh part or to a drum in which washing (or drying) operation is performed.

Further object of the present invention is to provide the washing machine, which can supply the steam to an external device such as a laundry-refreshing device, which is separately installed at the outside. Since a user can employ a steam generation unit in the washing machine for other purposes of the external device, the effectiveness of washing machine is improved.

Technical Solution

The objects of the present invention can be achieved by providing a washing machine, comprising: a steam generation unit to generate steam; and an steam outside-supplying pipe connected with the steam generation unit to supply the steam to an outside of the washing machine.

The steam generation unit can supply the steam into a drum in which washing or drying operation is performed, or to the outside of the washing machine through the steam outside-supplying pipe. Preferably, the washing machine has a button to select steam supply to the outside, and controls to allow the steam to be supplied to the outside through the steam outside-supplying pipe instead of the drum when the steam supply to the outside is selected.

Preferably, the steam outside-supplying pipe is able to be drawn out from the washing machine. The steam outside-supplying pipe has a sufficient length, and is received in the washing machine so that the steam outside-supplying pipe can be easily drawn out from the washing machine by simply pulling out the steam outside-supplying pipe from the washing machine.

Preferably, the steam outside-supplying pipe has an adjustable length so that the steam outside-supplying pipe is extended, and drawn to the outside when drawing the steam outside-supplying pipe to the outside. To this end, at least a portion of the steam outside-supplying pipe may be formed of a corrugated pipe, which has an adjustable length like a bellows pipe. Alternatively, the steam outside-supplying pipe may have a telescopic shape so as to be adjustable in length.

In addition, in order to supply the steam to the outside, a mounting part is formed on a cabinet which defines an appearance of the washing machine, and has one end connected with the steam outside-supplying pipe and the other end with which a separate outer connection pipe is detachably connected from the outside.
In accordance with another aspect of the present invention, there is provided a washing machine, comprising: a steam generation unit to generate steam; a laundry-receiving device having a space to receive laundry when unfolded; and a laundry-steam supplying pipe connected with the steam generation unit to supply the steam to the laundry-receiving device.

As such, the washing machine comprises the laundry-receiving device, and is adapted to supply the steam from the steam generation unit to the laundry-receiving device.

The laundry-receiving device has a foldable structure, and is thus received in a folded state inside or outside the washing machine when it is not used.

The laundry-receiving device may comprise a base; a cover to cover the base; and a body between the base and the cover to provide the space for receiving the laundry when unfolded.

When the laundry-receiving device is not used, the body is received in the folded state within the base, covered by the cover, and received in this state.

Preferably, the laundry-receiving device comprises an opening and closing structure in order to allow easy input and withdrawal of the laundry. For example, the laundry-receiving device may have a zipper structure formed on the body.

Preferably, the body is formed of a flexible material, and comprises a supporting structure in order to allow the body to be maintained in the folded state. The supporting structure may be a link structure or a telescopic structure. The supporting structure may be connected between the base and the cover such that the cover is separated from the base and supported thereby to allow the body to be maintained in the folded state.

In addition, preferably, the laundry-receiving device is adapted to receive the laundry in a hung state therein. When the laundry is laid on a shelf-shaped member, effect of removing the wrinkles with the steam can be lowered. Thus, it is desirable to have the laundry-receiving device such that the laundry is received in the laundry-receiving device while being hung on a hanger thereof.

Although the laundry-steam supplying pipe can be secured to the cover or the base, it is desirable that the laundry-steam supplying pipe be detachably connected therewith.

Preferably, the washing machine has an accommodation space defined therein to accommodate and receive the laundry-receiving device described above. For example, the washing machine may be provided with a structure which is capable of being input
thereto or withdrawn therefrom like a drawer to accept and preserve the laundry-receiving device.

[36]  At this time, the base is integrally formed with a support having the drawer structure.

[37]  The laundry-steam supplying pipe has an adjustable length.

[38]  In accordance with yet another aspect of the present invention, there is provided a washing machine, comprising: a steam generation unit to generate steam; a drum to receive laundry to be washed or dried; a laundry-receiving device having a space to receive the laundry when unfolded; a laundry-steam supplying pipe having a steam-steam valve controlled by a controller to supply the steam to the laundry-receiving device; and a drum-steam supplying pipe having a steam-drum valve controlled by the controller to supply the steam to the drum.

[39]  The controller controls the steam-laundry valve and the steam-drum valve to allow the steam to be supplied to the drum or to the laundry-receiving device.

[40]  The steam-drum valve and the steam-laundry valve are solenoid valves.

[41]  Although the laundry-steam supplying pipe and the drum-steam supplying pipe can be provided separately, it is desirable that a single pipe be branched to the laundry-steam supplying pipe and the drum-steam supplying pipe. In addition, the steam-laundry valve and the steam-drum valve are integrated into a single valve at a branched portion of the single pipe. Preferably, the integral valve is a three-way valve. With this structure, it is possible to selectively supply the steam only to the drum, to the laundry-receiving device, or to both the drum and the laundry-receiving device.

[42]  The pipes may have a check valve installed therein to prevent reverse flow of the steam, if necessary.

[43]  In accordance with yet another aspect of the present invention, a method for controlling the washing machine comprises: a) selecting a course requiring steam; b) determining an object to be supplied with the steam according to the selected course; c) controlling a valve of a steam supplying pipe to supply the steam to the determined object; and d) generating and supplying the steam through control of a steam generation unit.

[44]  In this structure, a user selects a predetermined operation course using a button on a control panel, and determines an object to be supplied with the steam if the selected course is a course requiring the steam, so that steam is generated and supplied to the object.

[45]  For example, if the selected course is a washing course which employs the steam,
the controller determines to supply the steam to the drum, and controls the steam
generation unit to generate the steam and the valve to allow the steam to be supplied to
the drum.

[46] In the washing machine comprising the laundry-receiving device, the course may
be at least one of a course requiring steam supply to the drum, a course requiring the
steam supply to the laundry-receiving device, and a course requiring the steam supply
to both the drum and the laundry-receiving device.

[47] In the washing machine capable of supplying the steam to the outside, the course
may be at least one of a course requiring steam supply to the drum, a course requiring
the steam supply to the outside of the washing machine, and a course requiring the
steam supply to both the drum and the outside of the washing machine.

[48] Preferably, operation of the steam generation unit is controlled on the basis of at
least one of operation cycle, operation temperature, and operation time. For example,
the steam generation unit can be operated for a preset period of time, or operated with
reference to a preset temperature. In addition, preferably, the temperature is an inner
temperature of the tub.

**Advantageous Effects**

[49] According to the present invention, the steam can be used for various operations in
addition to washing or drying operation within the drum. As a result, it is possible to
enhance effectiveness of the washing machine while providing various functions.

[50] According to the present invention, since the washing machine comprises the
separate laundry-steam supplying pipe, and removes wrinkles on the laundry by
supplying the steam to the laundry received therein, the washing machine can provide
a water washing effect without using water. Furthermore, the effect of water washing
can be further enhanced by using a deodorant or aromatic agent. In addition, when
preserving out-of-season laundry for a long period of time in the washing machine of
the present invention, it is possible to store the laundry with a good condition while
preventing the laundry from being dirtied. The washing machine of the present
invention provides convenience to the user in that, if the user controls the washing
machine to supply the steam to the laundry-receiving device after taking off and
hanging clothes in the laundry-receiving device in the evening, he or she can wear the
clothes, which look like newly washed clothes, the next morning.

[51] Since it is possible to supply the steam from the steam generation unit installed in
the washing machine to the outside through the steam outside-supplying pipe, the
washing machine can be applied to various uses. For example, the washing machine
can supply the steam to a refresh part at the outside, and provide swelling and sterilizing effects for the laundry such as underwear, which is desired to be washed with water, by supplying the steam to the laundry. In addition, when the user employs a steam iron, it is possible to use the steam of the washing machine. As such, the steam generation unit of the washing machine can be applied to various uses in addition to the above examples.

**Brief Description of the Drawings**

[52] The accompanying drawings, which are included to provide a further understanding of the invention, illustrate embodiments of the invention and together with the description serve to explain the principle of the invention.

[53] In the drawings:

[54] FIG. 1 is a schematic side elevation illustrating a washing machine in accordance with a first embodiment of the present invention;

[55] FIG. 2 is a schematic side elevation illustrating a modification of the washing machine in accordance with the first embodiment of the present invention;

[56] FIG. 3 is a schematic side elevation illustrating application of the washing machine in accordance with the first embodiment of the present invention;

[57] FIG. 4 is a schematic side elevation illustrating a washing machine in accordance with a second embodiment of the present invention;

[58] FIG. 5 is a schematic side elevation illustrating a modification of the washing machine in accordance with the second embodiment of the present invention;

[59] FIG. 6 is a schematic side elevation illustrating application of the washing machine in accordance with the second embodiment of the present invention;

[60] FIG. 7 is a schematic side elevation illustrating a washing machine in accordance with a third embodiment of the present invention;

[61] FIG. 8 is a schematic side elevation illustrating a modification of the washing machine in accordance with the third embodiment of the present invention;

[62] FIG. 9 is a schematic side elevation illustrating application of the washing machine in accordance with the third embodiment of the present invention;

[63] FIG. 10 is a schematic perspective view illustrating an appearance of a washing machine in accordance with a fourth embodiment of the present invention;

[64] FIG. 11 is a schematic side elevation illustrating the washing machine in accordance with the fourth embodiment of the present invention;

[65] FIGs. 12 and 14 are schematic perspective views illustrating application of the washing machine in accordance with the fourth embodiment of the present invention;
FIGS. 13 and 15 are schematic side elevations illustrating application of the washing machine in accordance with the fourth embodiment of the present invention;

FIG. 16 illustrates a washing machine in accordance with yet another embodiment of the present invention; and

FIG. 17 is a flow diagram illustrating a method for controlling the washing machine of the present invention.

**Best Mode for Carrying Out the Invention**

Reference will now be made in detail to the preferred embodiments of the present invention, examples of which are illustrated in FIGs. 1 to 15.

Referring to FIG. 1, a drum type washing machine will be described as one example of a washing machine according to a preferred embodiment of the present invention. The washing machine of the present invention generally comprises a body 110, a tub 120, a drum 130, a steam generation unit, and an steam outside-supplying pipe 180.

The body 110 defines an appearance of the washing machine, and is formed at a front side thereof with an input port 111.

The body 110 has a door 140 mounted on the input port 111 to open and close the input port 111, and a rim 112 mounted around an inner periphery of the input port 111 to seal between the door and the input port 111.

The body 110 is provided with a water supplying pipe 113 to supply water into the tub 120.

The tub 120 is provided in the body 110 in a state of being supported therein.

The drum 130 is rotatably installed in the tub 120 such that the drum 130 has an opening facing the input port 111 of the body 110.

The steam generation unit serves to generate supply steam. According to the present invention, the washing machine comprises at least one steam generation unit.

After being generated by the steam generation unit, steam is supplied into the drum 130 through a pipe 160.

The steam generation unit is installed in the washing machine to generate and supply the steam into the drum 130 by heating water with hot air having a high temperature.

The pipe 160 used for supplying the steam into the drum comprises an injection nozzle 170.

The pipe 160 further comprises a first valve 161 provided at a passage of the pipe to selectively open and close the passage. The injection nozzle 170 is adapted to allow
efficient injection of the steam, and is installed to the washing machine while
penetrating the rim 112 such that the tip of the injection nozzle 170 faces an inner
space of the drum 130.

The steam outside-supplying pipe 180 enables the steam generated by the steam
generation unit to be supplied to a separate external device outside the washing
machine instead of being supplied into the drum 130.

The steam outside-supplying pipe 180 has one end connected with the steam
generation unit, and the other end which can be selectively drawn out from the body
110.

The other end of the steam outside-supplying pipe 180 is adapted to be drawn out
through at least one of a front surface, a peripheral surface, an upper surface, a rear
surface and a bottom surface of the body 110.

According to a first embodiment of the present invention, the other end of the steam
outside-supplying pipe 180 is drawn out through a lower end of the front side of the
body 110.

Of course, when the washing machine further comprises a support 190 which
covers a predetermined accommodation space defined below the bottom surface of the
washing machine as shown in FIG. 2, the other end of the steam outside-supplying
pipe 180 may be adapted to be drawn out to the outside after sequentially passing
through the bottom surface of the body 110 and the support 190.

In addition, the steam outside-supplying pipe 180 is preferably provided with a
second valve 181 to selectively open and close the passage thereof.

At this time, the second valve 181 is operated to close the passage of the steam
outside-supplying pipe 180 if it is not necessary to supply the steam through the steam
outside-supplying pipe 180.

Meanwhile, it is more preferable that the steam outside-supplying pipe 180 has an
adjustable length.

This structure is for the purpose of enabling the washing machine and a device
requiring the steam supply to be connected with each other even if they are separated a
predetermined distance from each other.

To this end, according to the first embodiment of the present invention, a steam
discharge port of the steam outside-supplying pipe 180 is formed of a stretchable
corrugated pipe 182 in order to have the adjustable length, as shown in FIG. 1.

Of course, a steam discharge port 182 of the steam outside-supplying pipe 180 may
be formed of a telescopic pipe which consists of multiple parts overlapped with each
other in order to have the adjustable length.

[92] If the body 110 is provided with the support 190 having a predetermined accommodation space below the bottom surface thereof, and the steam discharge port 182 of the steam outside-supplying pipe 180 is exposed to the outside after passing through the support 190, although not shown in the drawings, the steam discharge port 182 of the steam outside-supplying pipe 180 may be formed of a hose having a sufficient length such that the steam outside-supplying pipe 180 can be accommodated in the support 190.

[93] That is, with this configuration, when the steam discharge port 182 of the steam outside-supplying pipe 180 is drawn out to the outside, a portion of the steam discharge port 182 accommodated in the support 190 is drawn out instead of changing the length of the steam discharge port 182.

[94] A steam supplying process using the washing machine according to the first embodiment of the present invention will be described with reference to FIGs. 1 to 3.

[95] First, when a user wants to supply steam to a separate external device denoted by reference numeral 500, the steam discharge port 182 of the steam outside-supplying pipe 180 having a portion thereof exposed to the outside from a front lower end of the body 110 in an initial state as shown in FIG. 1 is drawn out to the outside, and connected with the external device 500.

[96] At this time, the steam discharge port 182 of the steam outside-supplying pipe 180 formed of the corrugated pipe is gradually stretched from a folded state by a distance to be drawn out to the outside, and is then connected with the external device 500. This state is shown in FIG. 3.

[97] In this state, when the washing machine is controlled to allow the steam to be supplied into the steam outside-supplying pipe 180, heat generated from the heater 150 constituting the steam generation unit evaporates water in the steam generation unit, and generates the steam. Then, the steam flows through the pipe 160 or the steam outside-supplying pipe 180.

[98] At this time, the first valve 161 of the passage of the pipe 160 is operated to maintain a closed state of the passage, while the second valve 181 of the passage of the steam outside-supplying pipe 180 is operated to maintain an open state of the passage.

[99] Thus, the steam generated by the steam generation unit flows only through the steam outside-supplying pipe 180, and is then supplied to the external device 500 so as to be used in the external device 500 according to its purpose.

[100] For example, if the external device 500 is an apparatus for refreshing the laundry,
the steam is used for the purpose of the apparatus. On the other hand, if the external device 500 is a dish washer or a dish dryer, the steam is used for sterilization of dishes, and if the external device 500 is a cleaner, the steam is used for sterilization or cleaning.

[101] Meanwhile, it should be noted that the configuration of the steam outside-supplying pipe 180 according to the present invention is not limited to the configuration of the first embodiment wherein the steam outside-supplying pipe 180 is drawn out itself, and connected with the external device 500.

[102] In other words, if the external device 500 has a separate outer connection pipe to receive the steam, the steam outside-supplying pipe 180 may have configuration which enables the separate outer connection pipe to be connected thereto.

[103] In this regard, a second embodiment of the present invention provides a washing machine which is adapted to permit mounting of the outer connection pipe, which will be described in detail with reference to FIG. 4.

[104] First, the washing machine according to the second embodiment generally comprises a body 210 having a mounting part 214, a drum 230, a steam generation unit, and an steam outside-supplying pipe 280.

[105] The mounting part 214 is formed of a pipe configured so as to allow the outer connection pipe to be connected thereto from the outside.

[106] The mounting part 214 is formed on at least one of a front surface, a peripheral surface, an upper surface, a rear surface and a bottom surface of the body 210. The body 210 may have one or more mounting parts 214.

[107] According to the second embodiment, the mounting part 214 is formed at a lower side of the front surface of the body 210.

[108] Of course, if the body 210 is further provided with a support 290 below the bottom surface thereof as shown in FIG. 5, the mounting part 214 may be formed at the front side of the support 290.

[109] In addition, the mounting part 214 may be completely opened as suggested in this embodiment. However, although not shown in the drawing, it is more desirable that the body 210 have a separate cover on the mounting part 214 to open the mounting part 214 only when the mounting part 214 is used.

[110] Additionally, the steam outside-supplying pipe 280 serves to supply the steam generated by the steam generation unit to the mounting part 214.

[111] The steam outside-supplying pipe 280 has one end connected with the steam generation unit, and the other end connected with the mounting part 214 of the body
210, with which the outer connection pipe 510 is connected from the outside.

[112] At this time, the steam outside-supplying pipe 280 is preferably provided with a second valve 281 to selectively open and close the passage thereof as in the first embodiment.

[113] The drum 230 and the steam generation unit of the washing machine according to the second embodiment have the same configuration as those of the first embodiment.

[114] Operation of the washing machine according to the second embodiment of the present invention will be described in detail as follows.

[115] First, when the user wants to supply steam to a separate external device denoted by reference numeral 500, the separate outer connection pipe 510 of the external device 500 is mounted on the mounting part 214 of the body 210 as shown in FIG. 6 from an initial state as shown in FIG. 4.

[116] In this state, when the washing machine is controlled to allow the steam to be supplied into the steam outside-supplying pipe 280, heat generated from the heater 250 constituting the steam generation unit evaporates water in the steam generation unit, and generates the steam. Then, the steam flows through the pipe 260 connected with the drum, and the steam outside-supplying pipe 280.

[117] At this time, the first valve 161 provided at the passage of the pipe 260 is operated to maintain a closed state of the passage, while the second valve 281 provided at the passage of the steam outside-supplying pipe 280 is operated to maintain an open state of the passage.

[118] Thus, the steam generated by the steam generation unit flows only through the steam outside-supplying pipe 280, and is then supplied to the external device 500 through the outer connection pipe 510 mounted on the mounting part 214 so as to be used in the external device 500 according to its purpose.

[119] Meanwhile, the external device in the first and second embodiments of the present invention can be various apparatuses such as a cleaner, a dish washer, a dish drier, a humidifier, etc. as well as the washing machine and the drier.

[120] A third embodiment of the present invention provides a washing machine which comprises a washing part 310, a refresh part 320, and a laundry-steam supplying pipe 330 as shown in FIG. 7.

[121] Here, the washing part 310 is a part in which washing and/or drying of laundry is performed as in a drum type washing machine, a combined drying and washing machine, or a laundry drying machine.

[122] Here, a refresh operation is operation of removing the wrinkles from the laundry
using steam having a high temperature.

[123] The refresh part 320 is adapted to perform only the refresh operation for the laundry.

[124] The refresh part 320 generally comprises a base 321, a cover 322 to selectively cover an upper surface of the base 321, and a body 323 connected between the base 321 and the cover 322 such that the body 323 is spread to define a laundry-receiving space for the refresh operation when the cover 322 is opened.

[125] Of course, the refresh part 320 may further comprise an additional steam generation unit in the base 321.

[126] In addition, as in the first embodiment of the present invention, the laundry-steam supplying pipe 330 is constructed such that one end of the laundry-steam supplying pipe 330 is connected with the steam generation unit of the washing part 310, and a steam discharge port 332 at the other side of the laundry-steam supplying pipe 330 is drawn out to the outside of the washing part 310 so as to be connected with the refresh part 320.

[127] Preferably, the steam discharge port 332 of the laundry-steam supplying pipe 330 is detachably connected with the refresh part 320 by selection of the user. This structure is adapted for the purpose of allowing the refresh part 320 to be used independent of the washing part 310.

[128] In particular, the tip of the steam discharge port 332 of the laundry-steam supplying pipe 330 may be connected with one of the cover 322 and the base 321 of the refresh part 320.

[129] In this embodiment, the steam discharge port 332 of the laundry-steam supplying pipe 330 is connected with the upper surface of the cover 322 constituting the refresh part 320. To this end, the upper surface of the cover 322 is formed with a coupling hole 322a such that the tip of the steam discharge port 332 penetrates, and engages with the coupling hole 322a.

[130] Most preferably, the steam discharge port 332 of the laundry-steam supplying pipe 330 is formed of a corrugated pipe 182 which has an adjustable length, as shown in the drawings, such that the steam discharge port 332 of the laundry-steam supplying pipe 330 is easily coupled to the refresh part 320 irrespective of a distance therebetween.

[131] In addition, the laundry-steam supplying pipe 330 is preferably provided with a steam-laundry valve 331 to selectively open and close the passage thereof as for the second valve of the first and second embodiments.

[132] Operation of the washing machine according to the third embodiment of the present
invention will be described in detail as follows.

133. First, when the user wants to perform the refresh operation for laundry using the washing machine of this embodiment, the cover 322 of the refresh part 320 is opened from the base 321 as shown in FIG. 8 from a state as shown in FIG. 7, thereby allowing the body 323 to be spread.

134. At this time, the steam discharge port 332 of the laundry-steam supplying pipe 330 penetrates, and engages with the coupling hole 322a formed on the upper surface of the cover 322.

135. In this state, after inputting the laundry desired to be refreshed into the body 323 of the refresh part 320, the steam generation unit is operated.

136. Then, steam is generated by the steam generation unit, and supplied into the cover 322 of the refresh part 320 through the steam discharge port 332 of the laundry-steam supplying pipe 330.

137. As a result, the steam passes through the cover 322, and is supplied to the laundry received in the body 323 while flowing within the body 323, thereby refreshing the laundry.

138. Meanwhile, among the components of the washing machine according to the third embodiment, it is not necessary to directly connect the laundry-steam supplying pipe 330 with the refresh part 320.

139. That is, as in the configuration of the washing machine according to the second embodiment shown in FIG. 9, the washing machine may comprise a mounting part 311 formed on a cabinet, and a separate outer connection pipe 324 connected with the mounting part 311 to supply the steam to the outside, in which the steam discharge port 332 of the laundry-steam supplying pipe 330 is connected with the mounting part 311.

140. Meanwhile, although the refresh part 320 is described as being independent of the washing part 310 as in the third embodiment, it may be provided as a component dependent on the washing part 310.

141. In other words, as shown in FIGs. 10 and 11, if the washing part 310 is further provided at a lower portion with a support 312, which has a predetermined accommodation space and is capable of being drawn out, the refresh part 320 can be integrated into the accommodation space of the support 312, or can be detachably installed thereto such that it is detached or mounted thereto according to a user's selection.

142. A fourth embodiment of the present invention provides a washing machine in
which a refresh part 320 is integrated into the support 312. Reference numeral 313 represents a drawer type body for drawing out or inserting the support 312.

In particular, when the refresh part 320 is mounted in the accommodation space of the support 312 as described above, the steam discharge port 332 of the laundry-steam supplying pipe 330 is connected with the base 321 constituting the refresh part 320.

At this time, it is most desirable that the steam discharge port 332 of the refresh part 320 be formed of a corrugated pipe, which has an adjustable length, such that when the support 312 is drawn out in order to use the refresh part 320, the steam discharge port 332 of the laundry-steam supplying pipe 330 is changed in length by a distance that the support 312 is drawn out.

Thus, when the user wants to perform the refresh operation (for example, removal of wrinkles, sterilization, removal of odor) for laundry using the washing machine of this embodiment, the refresh part 320 is drawn out from the body 313 supporting the bottom surface of the washing part 310 in a state as shown in FIGs. 10 and 11 so as to be exposes to the outside as shown in FIGs. 12 and 13, and the cover 322 of the refresh part 320 is then opened from the base 321, allowing the body to be spread, as shown in FIGs. 14 and 15:

At this time, the steam discharge port 332 of the laundry-steam supplying pipe 330 is extended by the drawn out distance of the support 312 while maintaining connection with the base 321 of the refresh part 320.

In this state, after inputting the laundry desired to be refreshed into the body 323 of the refresh part 320, the steam generation unit is operated.

Then, steam is generated by the steam generation unit, and supplied into the base 321 of the refresh part 320 through the steam discharge port 332 of the laundry-steam supplying pipe 330.

As a result, the steam passes through the base 321, and is supplied to the laundry received in the body 323 while rising into the body 323, thereby refreshing the laundry.

At this time, when the steam is supplied into the drum, the steam is generated by the steam generation unit, and flows to the drum through a drum-steam supplying pipe 260.

FIG. 16 shows yet another embodiment of the present invention. In this embodiment, one pipe is divided into a drum-steam supplying pipe 260 and a laundry-steam supplying pipe 330 and provided with an integration valve 431 where the pipe is divided.
The integration valve 431 is a three-way valve. With this structure, it is possible to selectively supply the steam only to the drum, to the laundry-receiving device, or to both the drum and the laundry-receiving device.

Operation of the washing machine according to the present invention will be described with reference to FIG. 17 in which the washing machine shown in FIG. 15 will be described as an example.

First, a controller receives a selection signal for an operation course which requires steam (S110). For example, the controller receives a selection signal corresponding to an operation item, which requires the steam, through a control panel from a user.

The operation course is at least one of a course which requires steam supply to the drum, a course which requires steam supply to the laundry-receiving device, and a course which requires steam supply to both the drum and the laundry-receiving device. The control panel is provided with selection buttons respectively corresponding to the courses to allow the user to select any one of the courses.

In other words, the operation item includes at least one of operation which comprises algorithm to supply the steam to the washing part 310, and operation which comprises algorithm to supply the steam to the refresh part 320.

The operation with the algorithm to supply the steam to the washing part 310 is one of tub cleaning operation, washing operation, rinsing operation, drying operation, and sterilizing operation for laundry using the steam.

The operation with the algorithm to supply the steam to the refresh part 320 is the refresh operation for the laundry using the steam.

Of course, it is possible to perform operation which comprises algorithm to supply the steam to both the washing part 310 and the refresh part 320. In this case, the refresh operation is selected along with one of the tub cleaning operation, washing operation, rinsing operation, drying operation and sterilizing operation. That is, in this case, the steam requiring operation is performed in both the refresh part 320 and the washing part 310.

Then, if it is determined that one of the operation items is selected by the user according to the process described above, the controller determines a steam requiring part based on the operation item selected by the user (S120).

At this time, the steam requiring part is at least one of the washing part 310 and the refresh part 320.

That is, if one of the tub cleaning operation, washing operation, rinsing operation, drying operation and sterilizing operation for the laundry is selected, the washing part
310 is determined as the steam requiring part, and if the refresh operation is selected, the refresh part 320 is determined as the steam requiring part.

[163] If the refresh operation is selected along with one of tub cleaning operation, washing operation, rinsing operation, drying operation and sterilizing operation for the laundry, both the refresh part 320 and the washing part 310 are determined as the steam requiring part.

[164] After determining the steam requiring part, the controller controls the valves 261 and 331 to allow the steam to be supplied only to the steam requiring part.

[165] Specifically, if the washing part 310 is determined as the steam requiring part, the controller controls the steam-drum-valve 261 provided to the drum-steam supplying pipe 260 to open the passage of the drum-steam supplying pipe 260 while controlling the steam-laundry-valve 331 provided to the laundry-steam supplying pipe 330 to close the passage of the laundry-steam supplying pipe 330 (S130).

[166] On the contrary, if the refresh part 320 is determined as the steam requiring part, the controller controls the steam-laundry-valve 331 of the laundry-steam supplying pipe 330 to open the passage of the laundry-steam supplying pipe 330 while controlling the steam-drum-valve 261 of the drum-steam supplying pipe 260 to close the passage of the drum-steam supplying pipe 260 (S140).

[167] If both the refresh part 320 and the washing part 310 are determined as the steam requiring part, the controller controls both the steam-drum-valve 261 of the drum-steam supplying pipe 260 and the steam-laundry-valve 331 of the laundry-steam supplying pipe 330 to open the passages of the laundry-steam supplying pipe 330 and the drum-steam supplying pipe 260 (S150).

[168] After controlling the respective valves 261 and 331, the controller controls the steam generation unit to generate steam (S160), and to supply the steam to the drum-steam supplying pipe 260 or the laundry-steam supplying pipe 330 (S170).

[169] Operation control of the steam generation unit is performed on the basis of at least an operating cycle, that is, a heating cycle of the heater to generate the steam, an operating temperature, that is, a temperature of the heater to determine the temperature of the steam, and an operating time, that is, a heating time of the heater until heating operation of the heater to perform an associated operation is completed.

[170] Finally, the washing part 310 and/or the refresh part 320 perform the desired operation (tub cleaning operation, washing operation, rinsing operation, drying operation, sterilizing operation, and/or refresh operation) with the steam supplied as described above (S180).
It will be apparent to those skilled in the art that various modifications and variations can be made in the present invention without departing from the spirit or scope of the invention. Thus, it is intended that the present invention cover the modifications and variations of this invention provided they come within the scope of the appended claims and their equivalents.

**Industrial Applicability**

The present invention relates to a laundry device, and more particularly, to a washing machine which comprises a steam generation unit installed therein to generate and supply steam to an outside of the washing machine or to a laundry-receiving device to remove wrinkles on laundry by using the steam supplied from the steam generation unit, and a method for controlling operation thereof, and a method for controlling the same.

According to the present invention, the steam can be used for various operations in addition to washing or drying within the drum. As a result, it is possible to enhance effectiveness of the washing machine while providing various functions.

According to the present invention, since the washing machine comprises the separate laundry-steam supplying pipe, and removes wrinkles on the laundry by supplying the steam to the laundry received therein, the washing machine can provide a water washing effect without using water. Furthermore, the water washing effect can be further enhanced by using a deodorant or aromatic agent. In addition, when preserving out-of-season laundry for a long period of time in the washing machine of the present invention, it is possible to store the laundry with a good condition while preventing the laundry from being dirtied. The washing machine of the present invention provides convenience to the user in that, if the user controls the washing machine to supply the steam to the laundry-receiving device after taking off and hanging clothes in the laundry-receiving device in the evening, he or she can wear the clothes, which look like newly washed clothes, the next morning.

Since it is possible to supply the steam from the steam generation unit installed in the washing machine to the outside through the steam outside-supplying pipe, the washing machine can be applied to various uses. For example, the washing machine can supply the steam to a refresh part at the outside, and provide swelling and sterilizing effects for the laundry such as underwear, which is desired to be washed with water, by supplying the steam to the laundry. In addition, when the user employs a steam iron, it is possible to use the steam of the washing machine. As such, the steam generation unit of the washing machine can be applied to various uses in addition to
the above examples.
Claims

[1] A washing or drying machine, comprising:
a steam generation unit to generate steam; and
an steam outside-supplying pipe connected with the steam generation unit to
supply the steam to an outside of the washing or drying machine.

[2] The washing or drying machine according to claim 1, wherein the steam outside-
supplying pipe is able to be drawn out from the washing or drying machine.

[3] The washing or drying machine according to claim 2, wherein the steam outside-
supplying pipe is length-adjustable.

[4] The washing or drying machine according to claim 3, wherein the steam outside-
supplying pipe has at least a part of a length-adjustable corrugated pipe.

[5] The washing or drying machine according to claim 3, wherein the steam outside-
supplying pipe has at least a part of a telescopic shape.

[6] The washing or drying machine according to claim 1, further comprising:
a mounting part formed on a cabinet of the washing or drying machine, the
mounting part having one end connected with the steam outside-supplying pipe,
and the other end detachably connected with an outer connection pipe coupled to
an external device.

[7] A washing or drying machine, comprising:
a steam generation unit to generate steam;
a laundry-receiving device having a space to receive laundry therein when
unfolded; and
a laundry-steam supplying pipe connected with the steam generation unit to
supply the steam to the laundry-receiving device.

[8] The washing or drying machine according to claim 7, wherein the laundry-
receiving device comprise:
a base;
a cover to cover the base; and
a body between the base and the cover to provide the space for receiving the
laundry when unfolded.

[9] The washing or drying machine according to claim 8, wherein the laundry-steam
supplying pipe is detachably connected with either the cover or the base.

[10] The washing or drying machine according to claim 8, further comprising:
a support capable of being drawn out from the washing or drying machine and
having an accommodation space to which the laundry-receiving device is installed.

[11] The washing or drying machine according to claim 10, wherein the base is integrally formed with the support.

[12] The washing or drying machine according to claim 10, wherein the laundry-steam supplying pipe is length-adjustable.

[13] A washing or drying machine, comprising:
- a steam generation unit to generate steam;
- a drum to receive laundry to be washed or dried;
- a laundry-receiving device having a space to receive the laundry therein when unfolded;
- a laundry-steam supplying pipe having a steam-laundry valve controlled by a controller to supply the steam to the laundry-receiving device; and
- a drum-steam supplying pipe having a steam-drum valve controlled by the controller to supply the steam to the drum.

[14] The washing or drying machine according to claim 13, wherein the steam-drum valve and the steam-laundry valve are solenoid valves.

[15] The washing or drying machine according to claim 13, wherein the steam-laundry supplying pipe is branched from the steam-drum supplying pipe, and the steam-laundry valve and the steam-drum valve are integrated and placed at the branch point.

[16] The washing or drying machine according to claim 15, wherein the integrated valve is a three-way valve.

[17] A method for controlling the washing or drying machine, comprising the steps of:
- a course requiring steam being selected;
- determining an object to be supplied with the steam according to the selected course;
- controlling a valve of a steam supplying pipe to supply the steam to the determined object; and
- generating and supplying the steam through control of a steam generation unit.

[18] The method according to claim 17, wherein the course is at least one of a course requiring the steam to be supplied to the drum, a course requiring the steam to be supplied to the laundry-receiving device, and a course requiring the steam to be supplied to both the drum and the laundry-receiving device.
[19] The method according to claim 17, wherein at the step of d), operation of the steam generation unit is controlled on the basis of at least one of operation cycle, operation temperature, and operation time.

[20] The method according to claim 17, wherein the course is at least one of a course requiring the steam to be supplied to the drum, a course requiring the steam to be supplied to an outside of the washing or drying machine, and a course requiring the steam to be supplied to both the drum and the outside of the washing or drying machine.
[Fig. 17]

Start

Select operation items requiring steam → S110

Selection completed?

Yes → Determine steam requiring part after checking selected operation item → S120

No →

① Washing part
② Refresh part
③ Washing part + Refresh part

S130 → Control steam flow guide to allow steam to be supplied only to washing machine

S150 → Control steam flow guide to allow steam to be supplied both to washing part and refresh part

S140 → Control steam flow guide to allow steam to be supplied only to refresh part

Generate steam by controlling steam generation unit → S160

Supply generated steam → S170

Operation with steam → S180

End
INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC*: D06F 58/20 (2006.01); D06F 58/10 (2006.01); D06F 39/04 (2006.01)
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC*: D06F

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
EPODOC, WPI, PAJ, TXTn

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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<th>Relevant to claim No.</th>
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<td>A</td>
<td>US 5 107 603 A (DURAZZANI) 28 April 1992 (28.04.1992) figure 1, column 2, line 31 - column 3, line 49</td>
<td>1-3, 7</td>
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<td>A</td>
<td>EP 1 146 161 A1 (WHIRLPOOL CORPORATION) 17 October 2001 (17.10.2001) figure 7</td>
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"A" document defining the general state of the art which is not considered to be of particular relevance
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