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(54) **CLEANER AND MOP BRUSH HEAD**

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CPC ***A47L 11/4088*** (2013.01); ***A46B 5/0095*** (2013.01); ***A47L 11/282*** (2013.01); ***A47L 11/4005*** (2013.01); ***A47L 11/4011*** (2013.01); ***A47L 11/4027*** (2013.01); ***A47L 11/4036*** (2013.01); ***A47L 11/4083*** (2013.01); *A46B 2200/3033* (2013.01)

(57) **ABSTRACT**

A cleaner includes a mop brush head whereby cleaning using water is possible, the mop brush head includes a water tank storing water, at least one mop, a sprayer spraying water toward the surface to be cleaned, and a heating module configured to heat water supplied from the water tank, wherein the heating module includes a hot water tank storing water flowing in from the water tank, a heater that heats the water stored in the hot water tank, and a channel structure provided inside the hot water tank so that water in the hot water tank moves along a preset path.

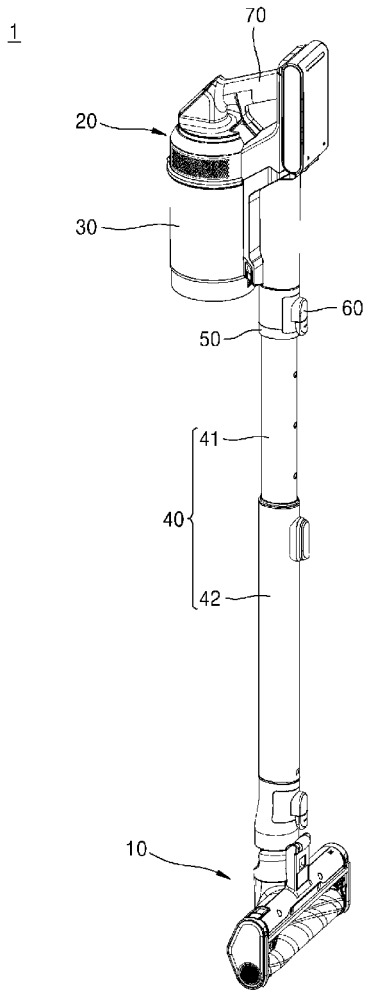

FIG. 1

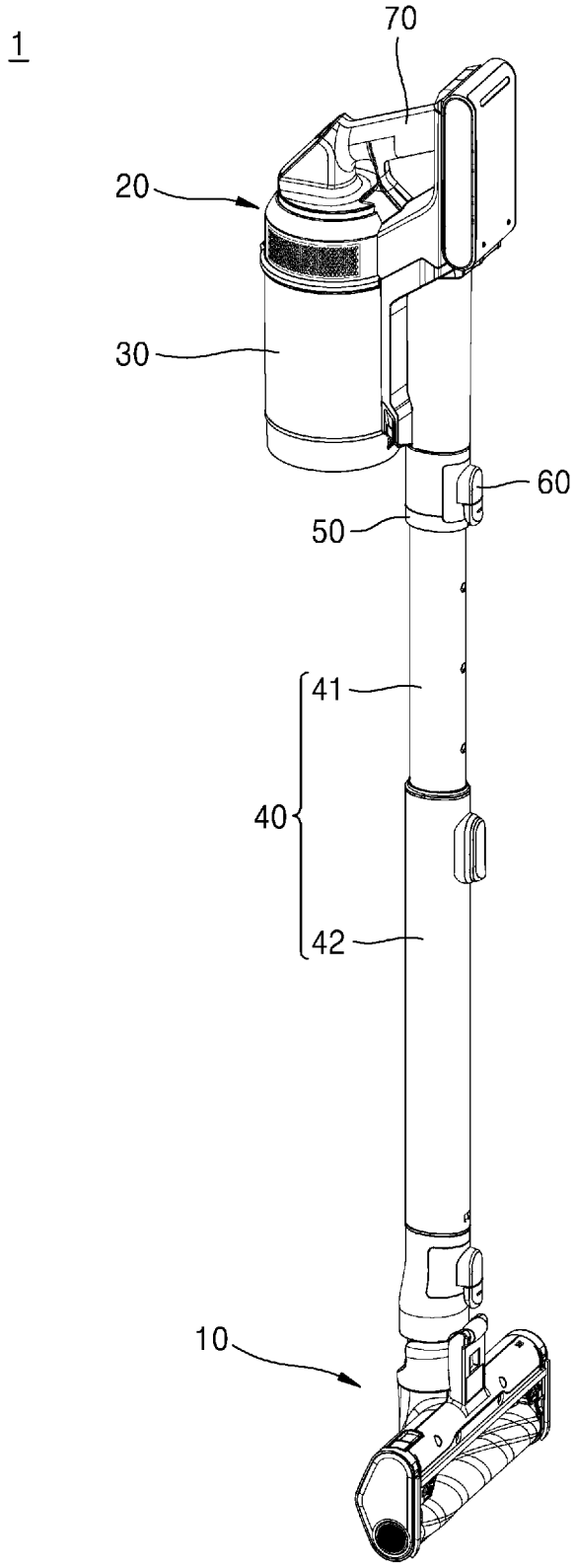

FIG. 2

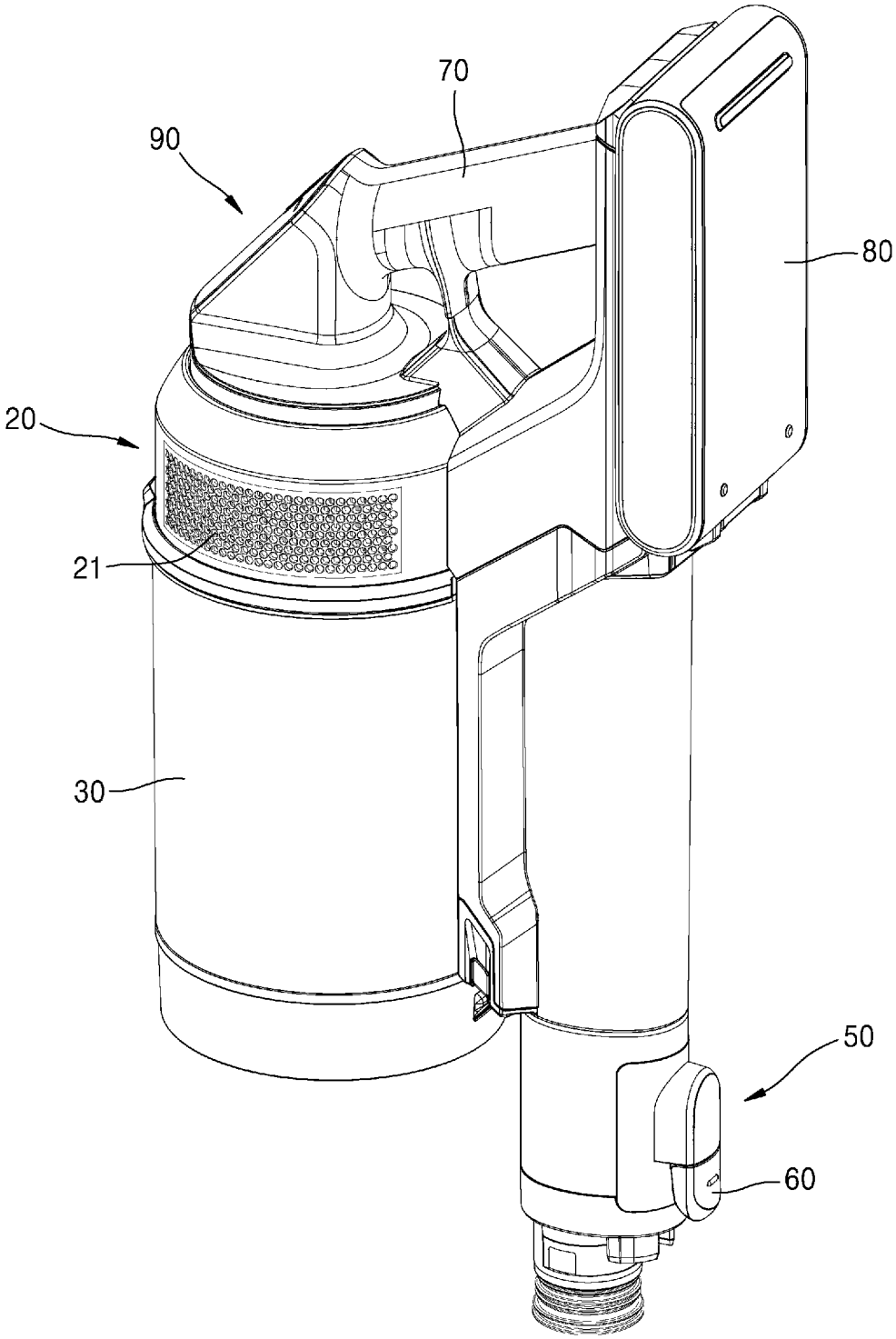

FIG. 3

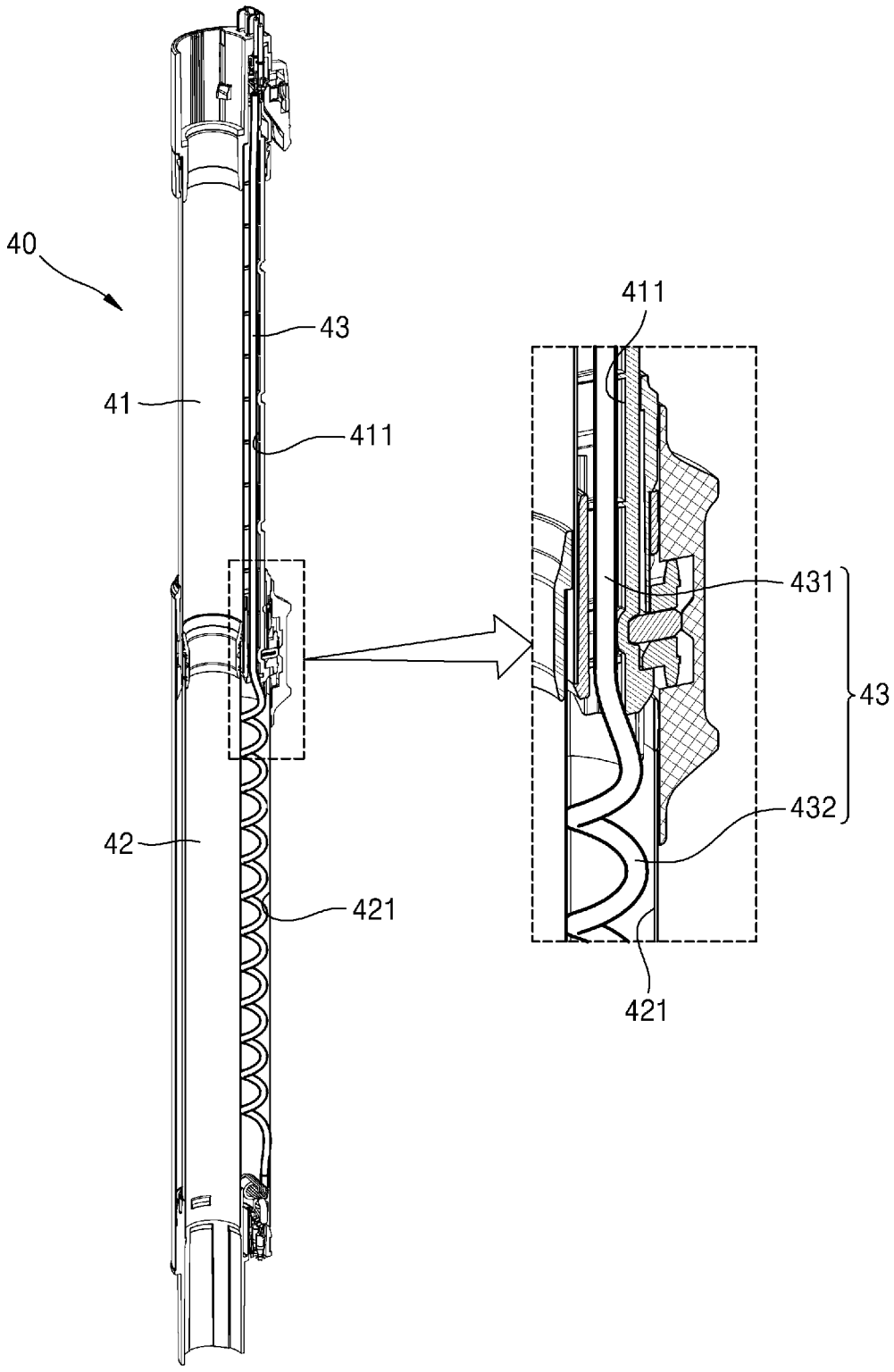

FIG. 4

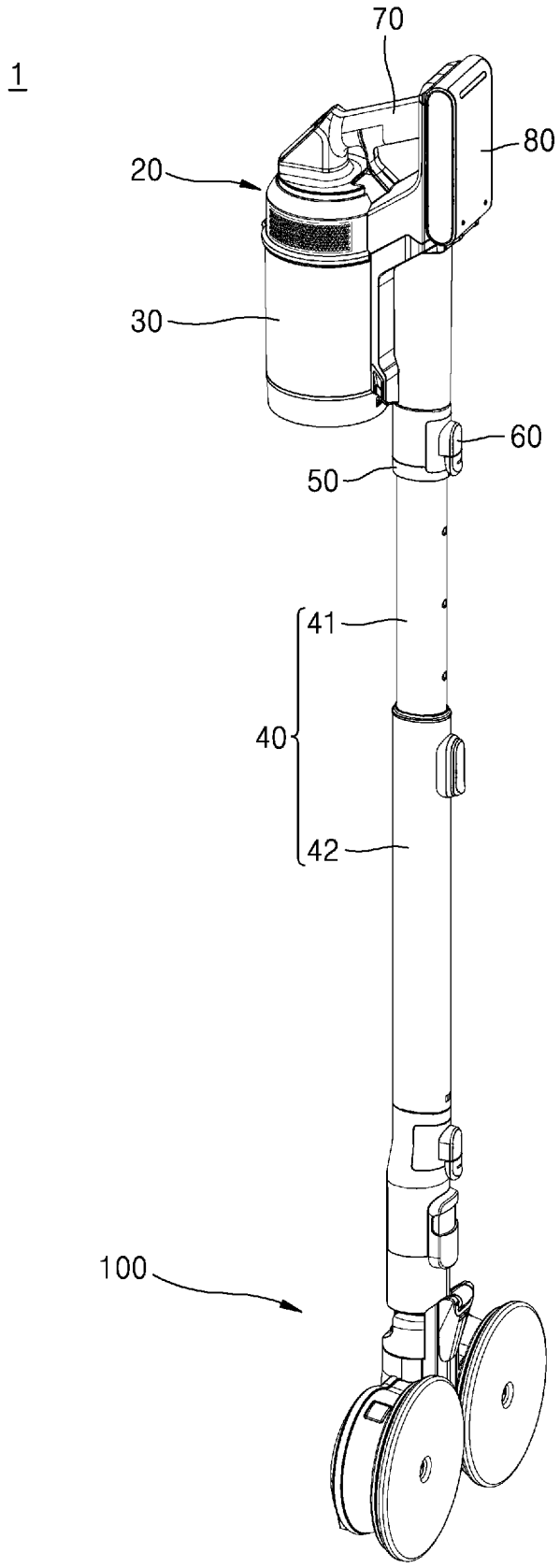

FIG. 5

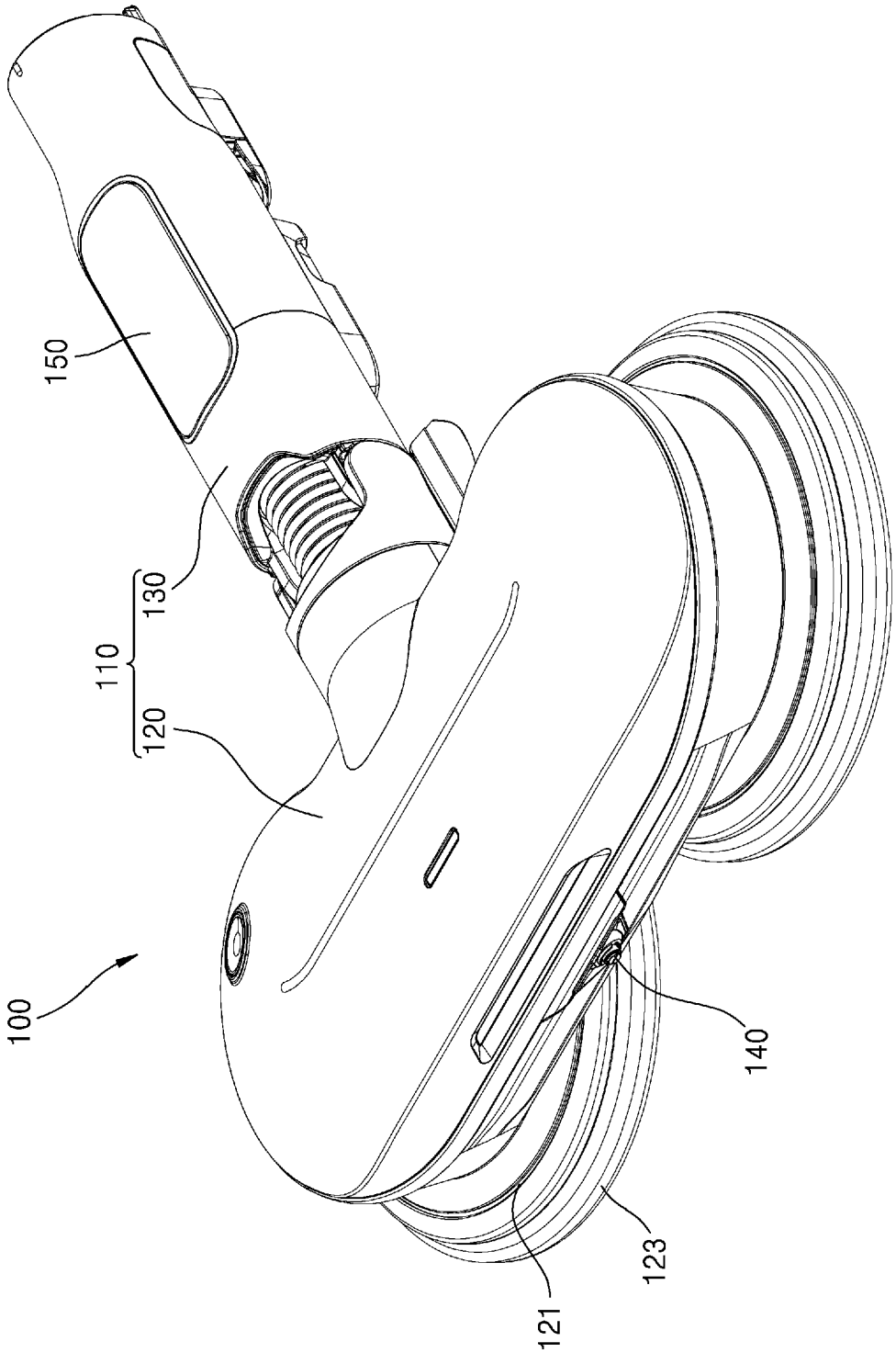

FIG. 6

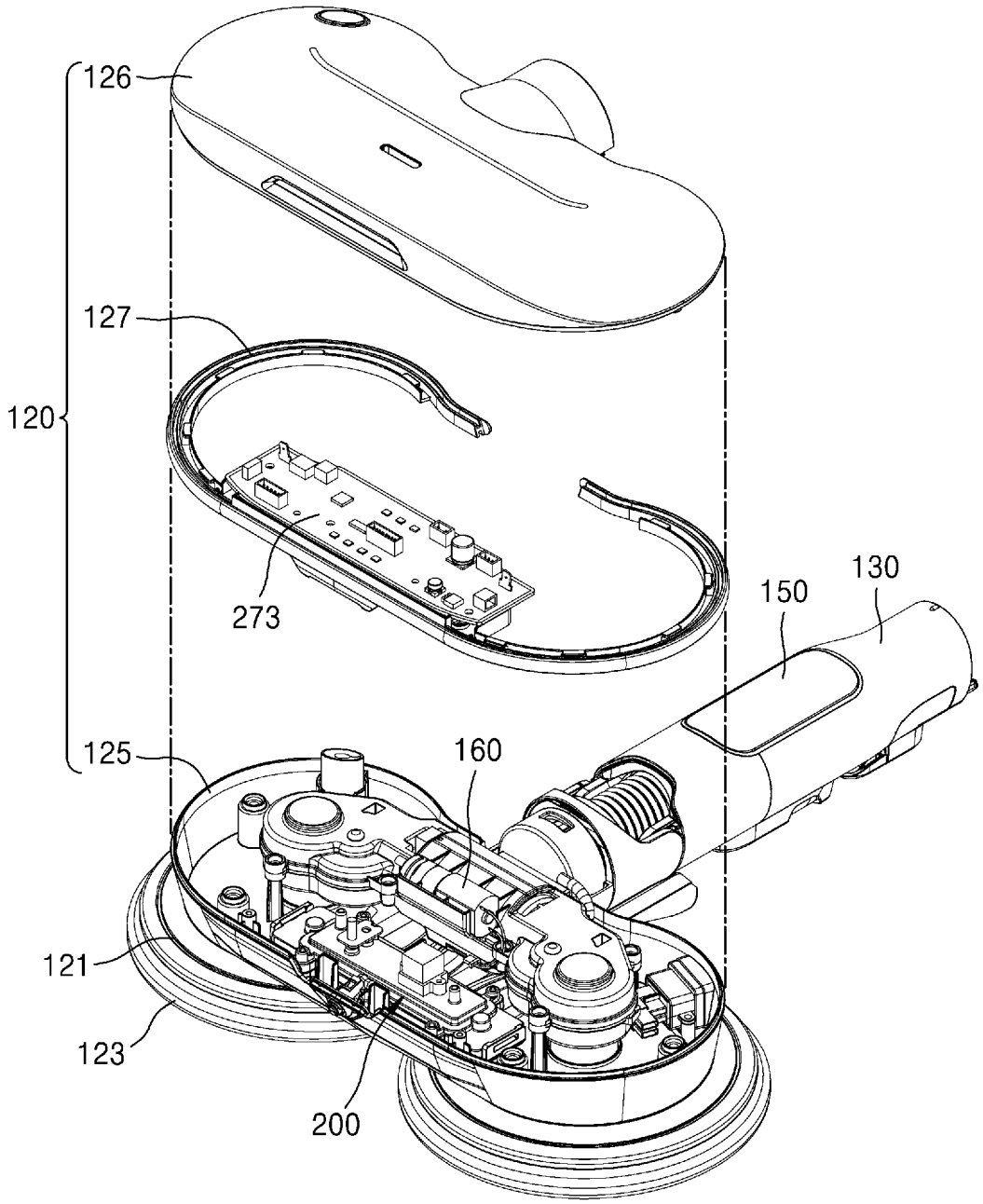

FIG. 7

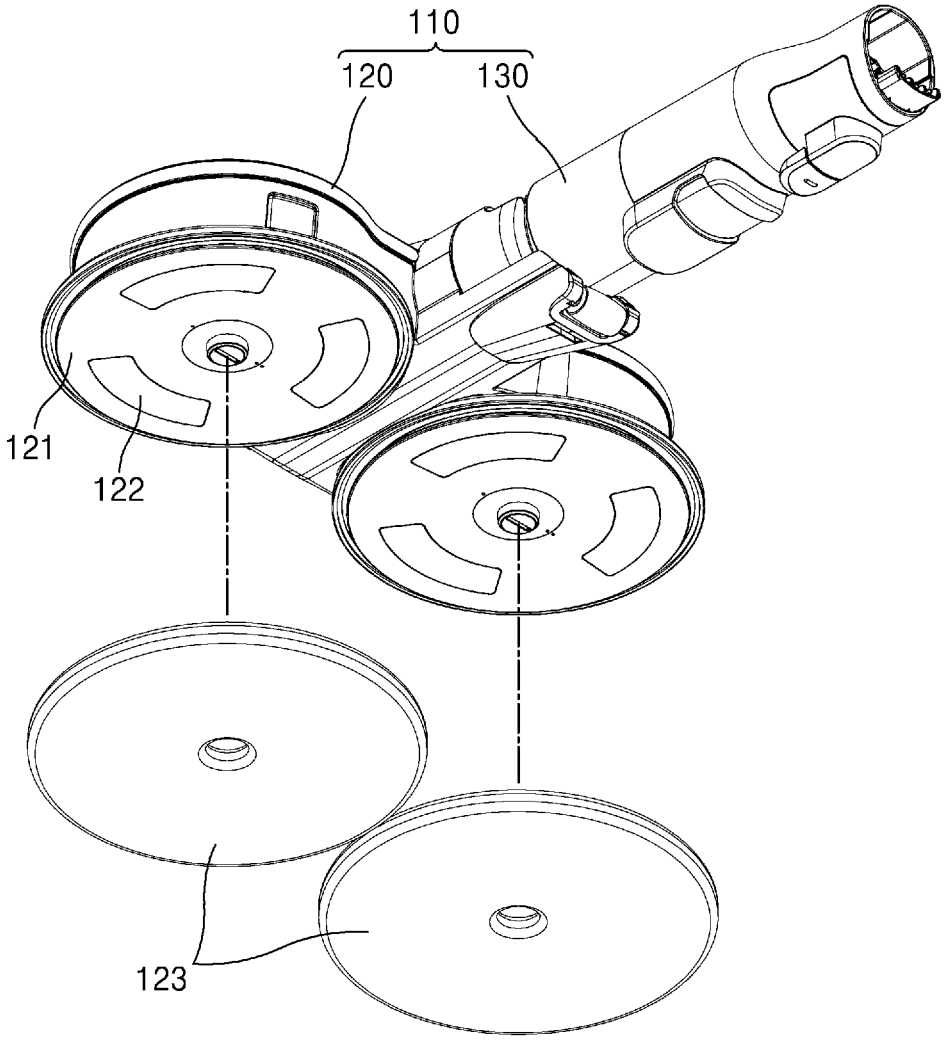

FIG. 8

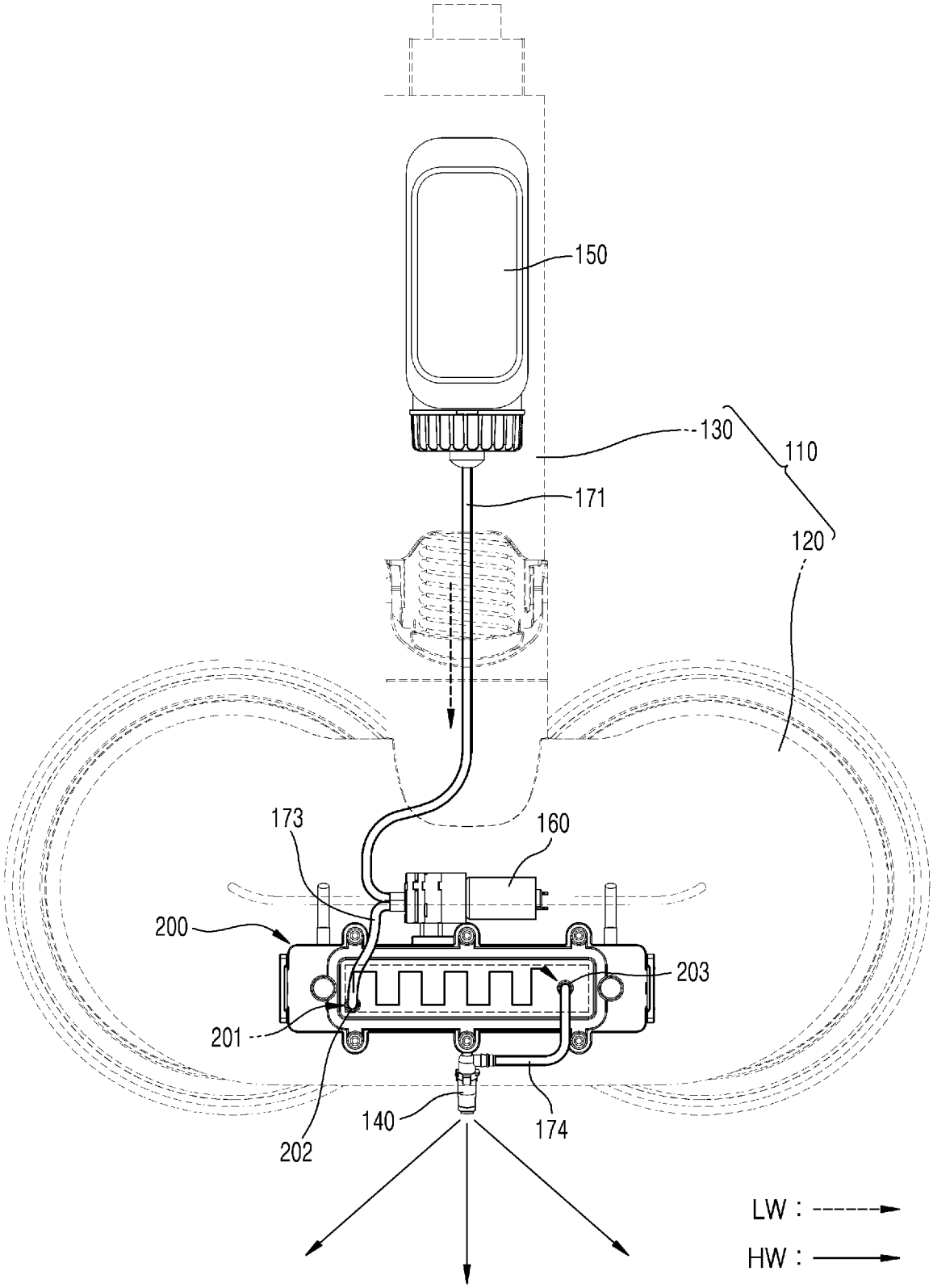

FIG. 9

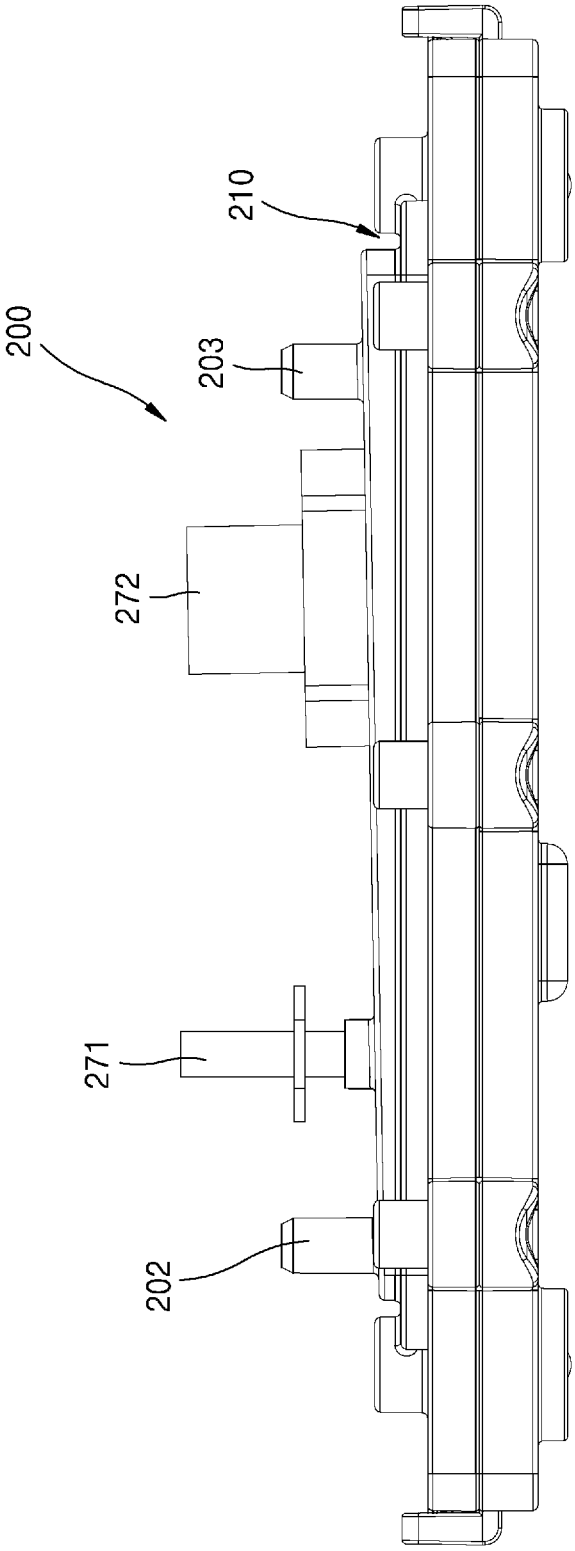

FIG. 10

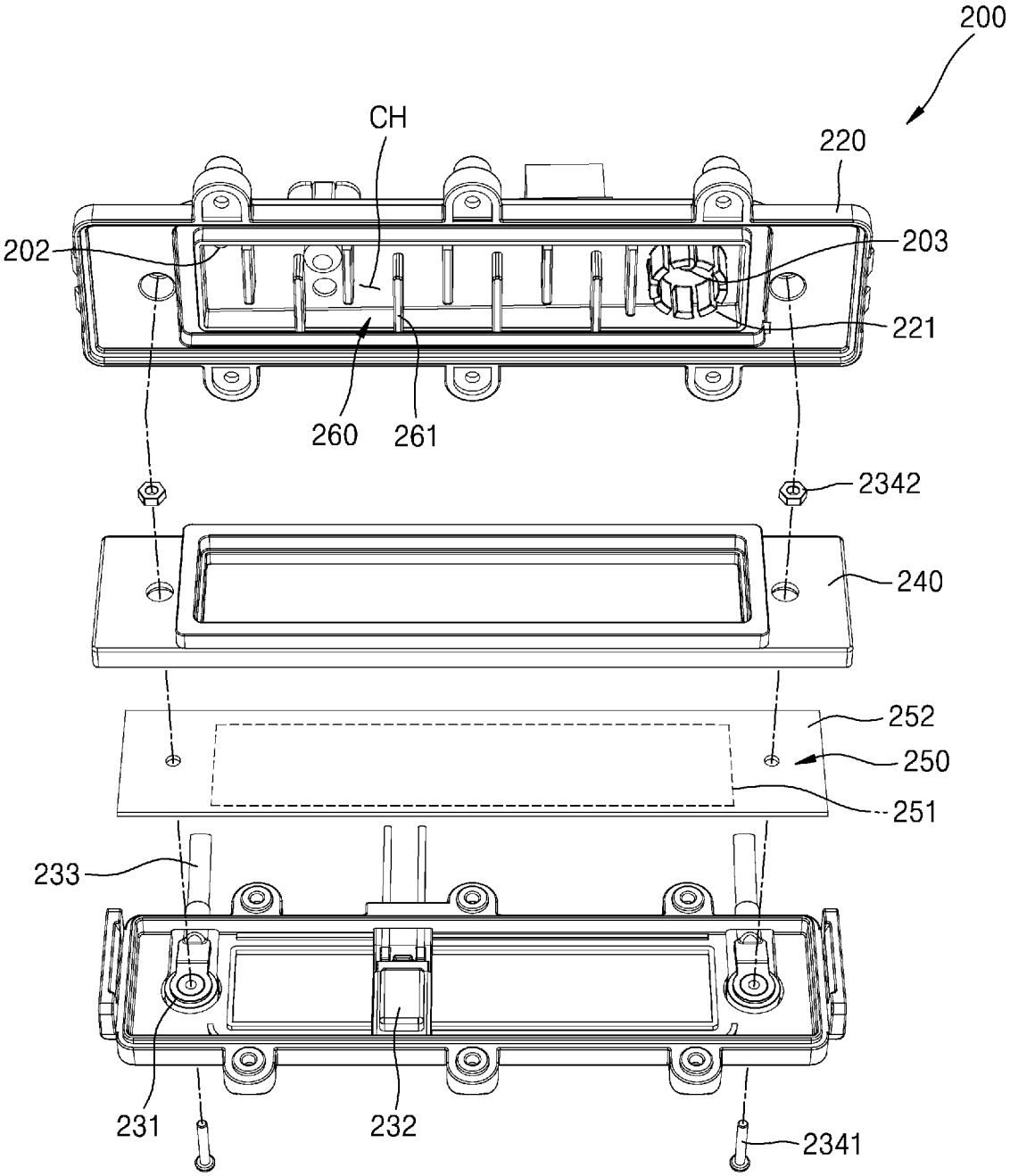
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FIG. 11

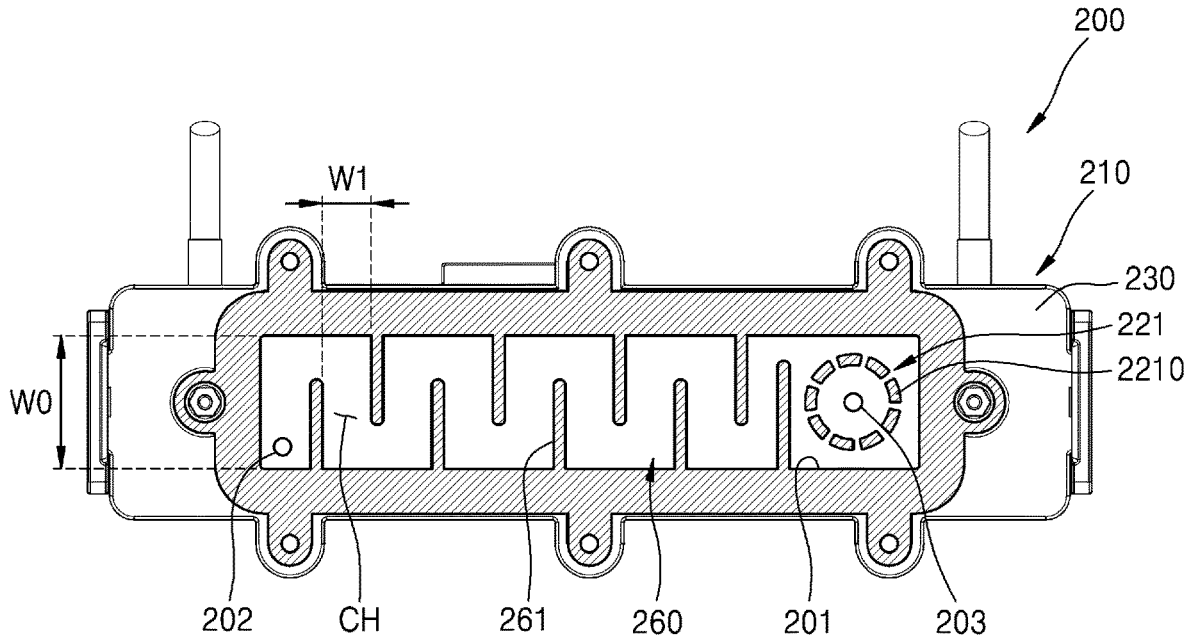


FIG. 12A

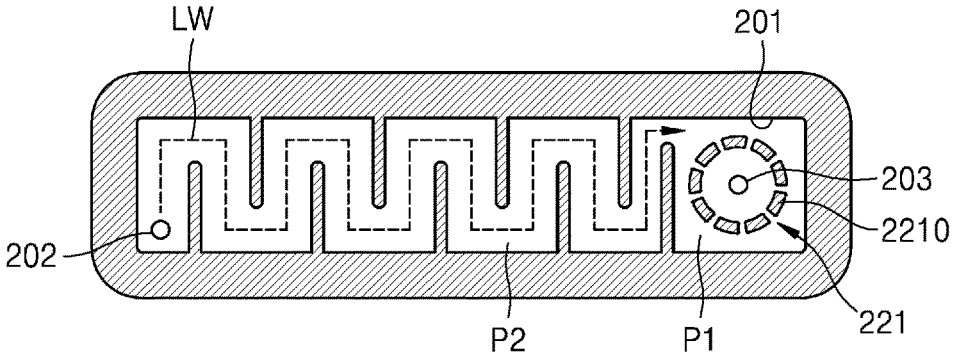


FIG. 12B

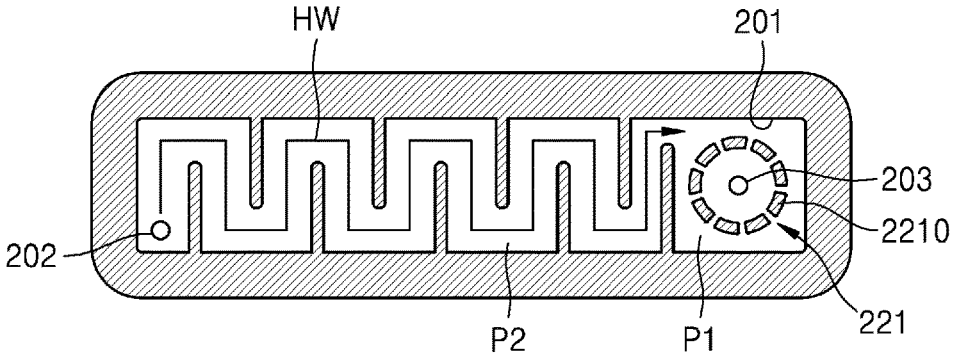


FIG. 12C

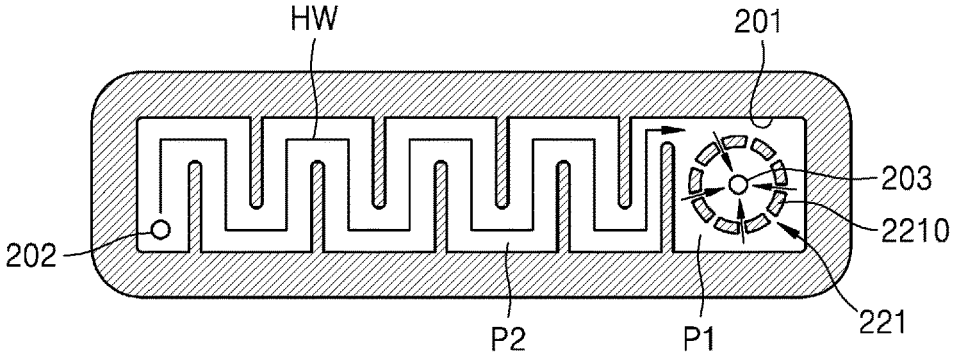


FIG. 12D

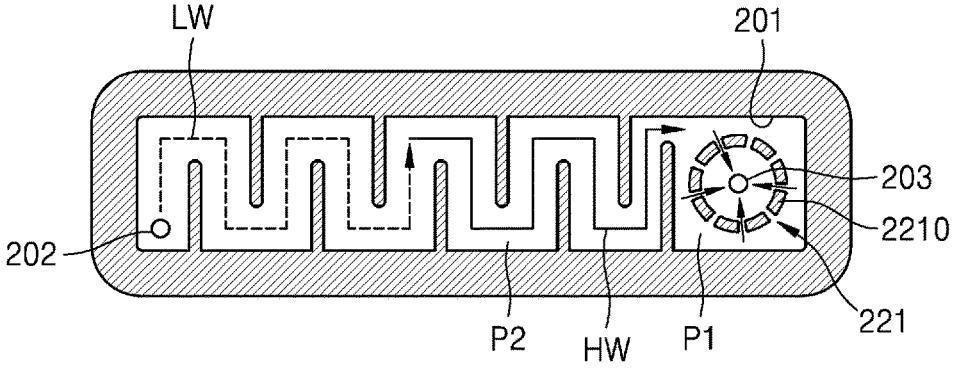


FIG. 13A

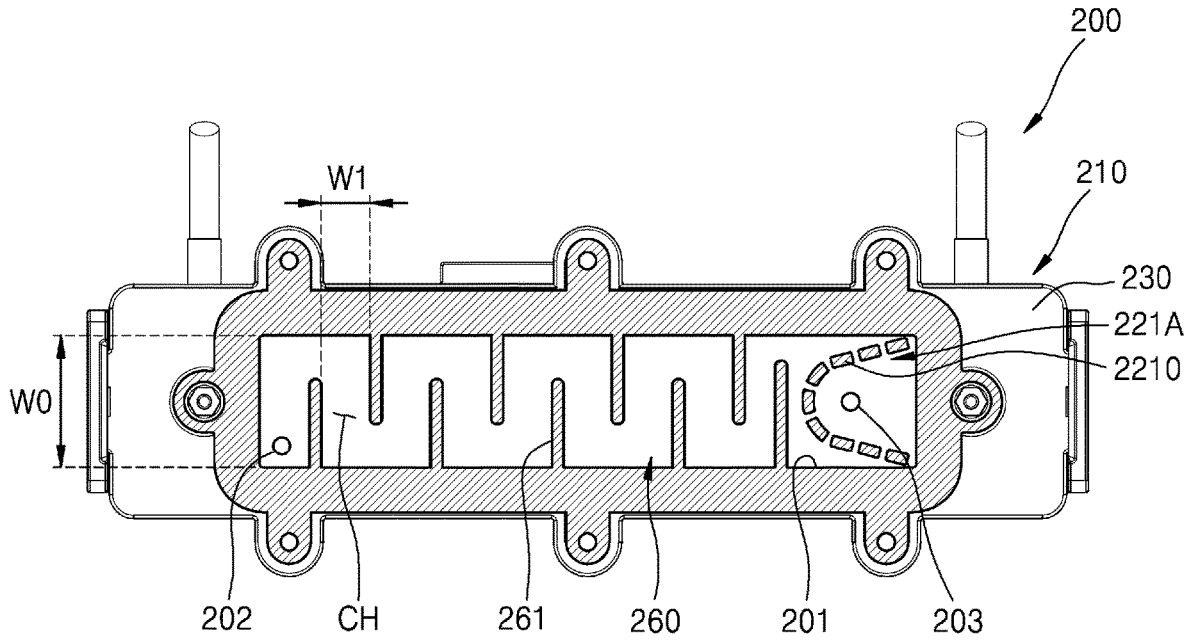


FIG. 13B

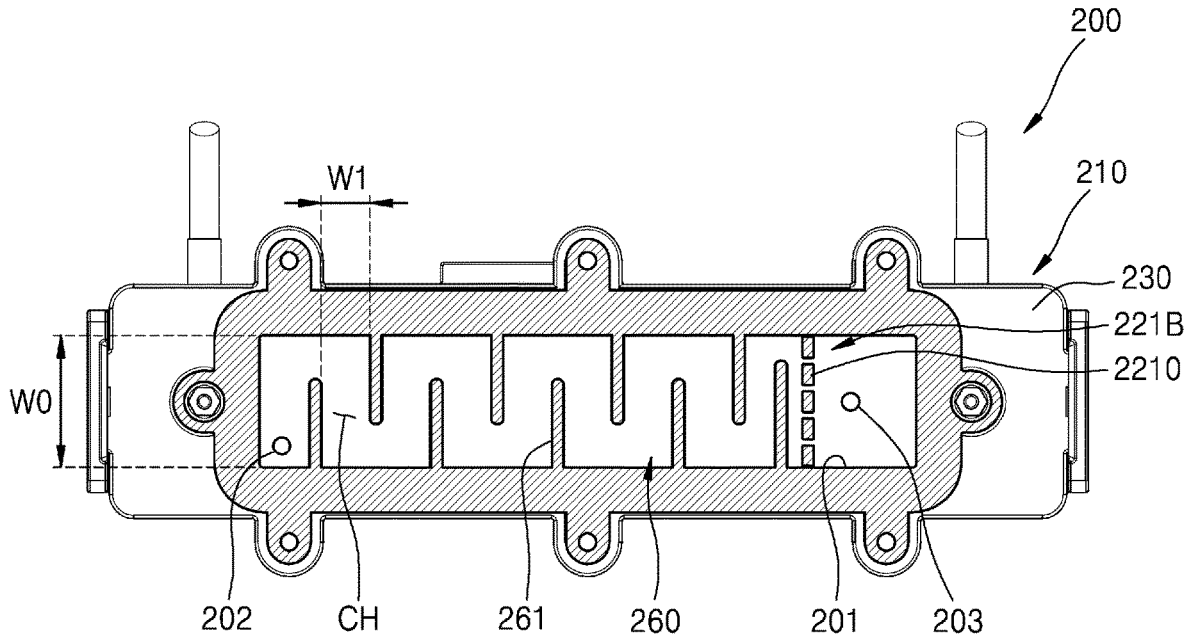


FIG. 14

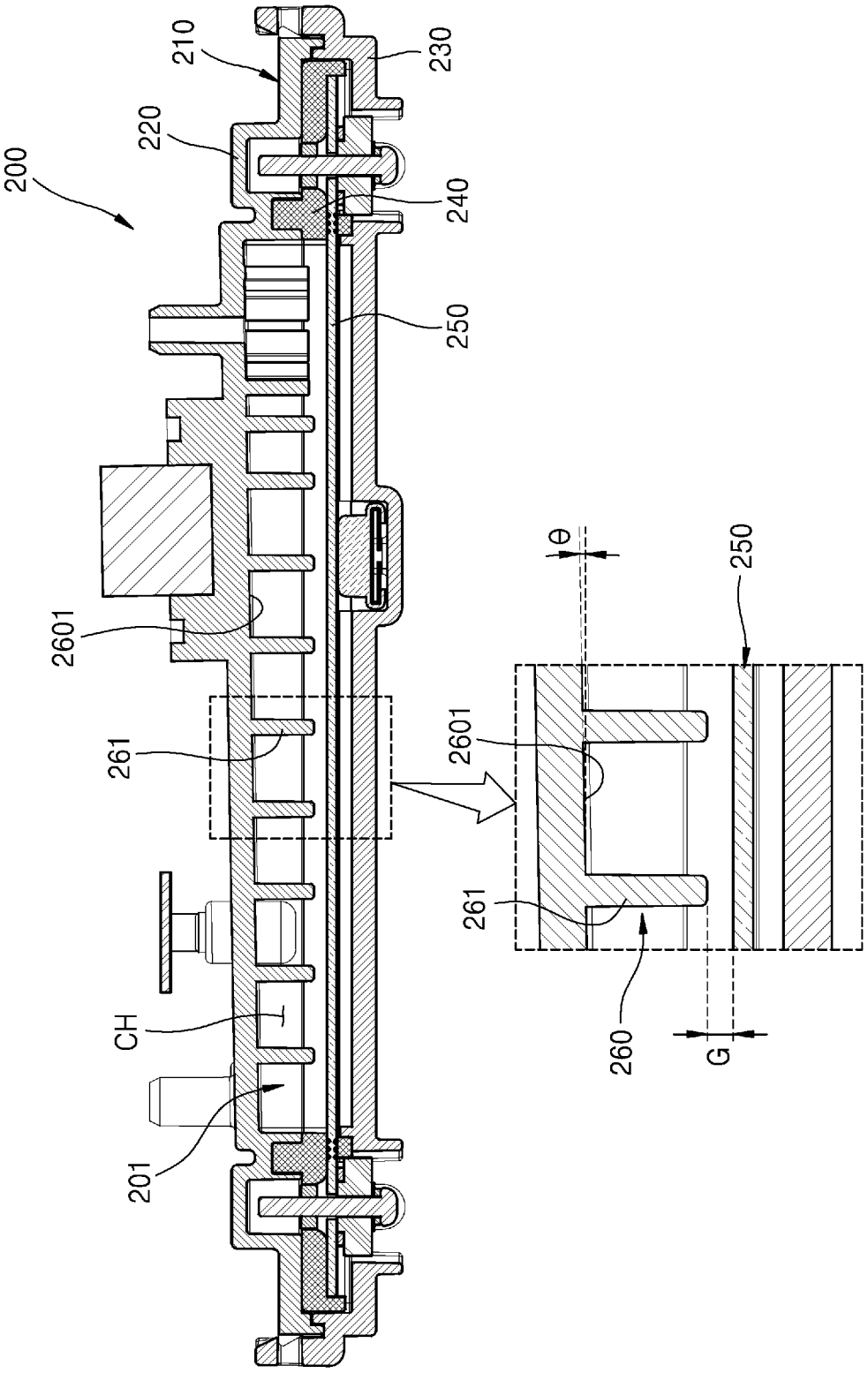


FIG. 15

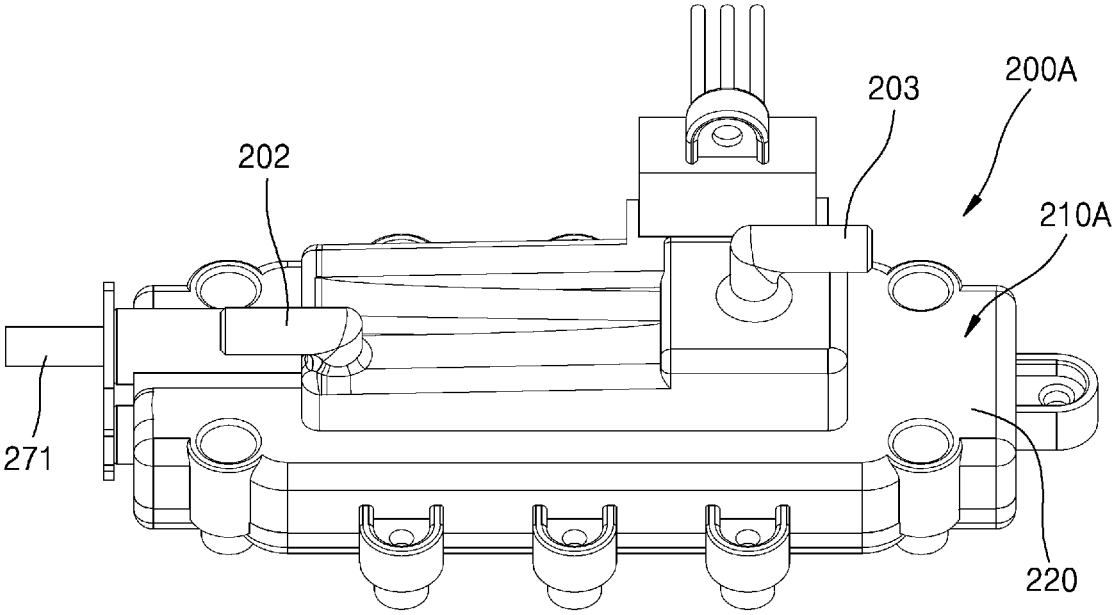


FIG. 16

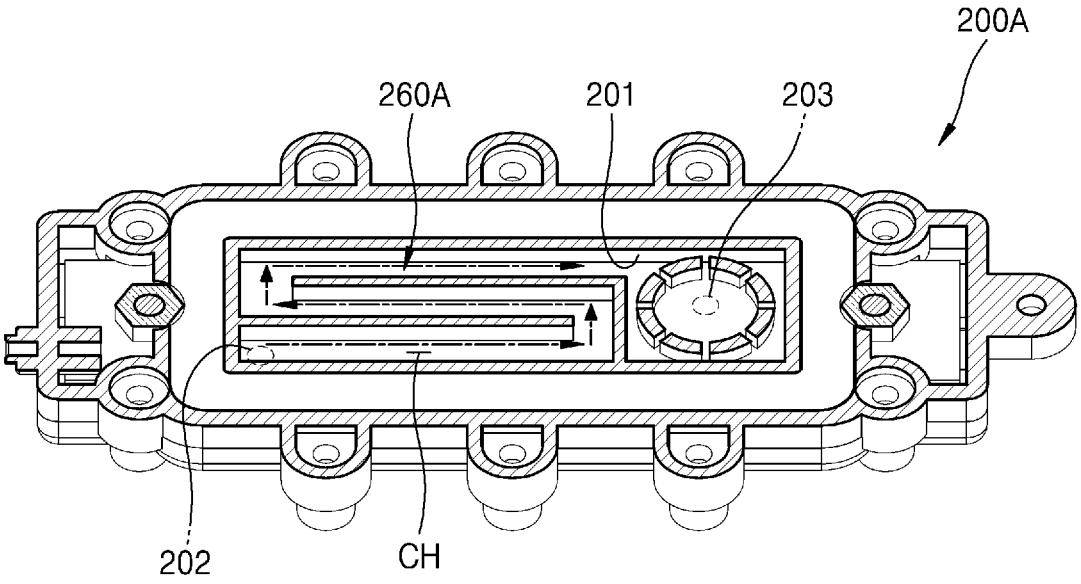


FIG. 17

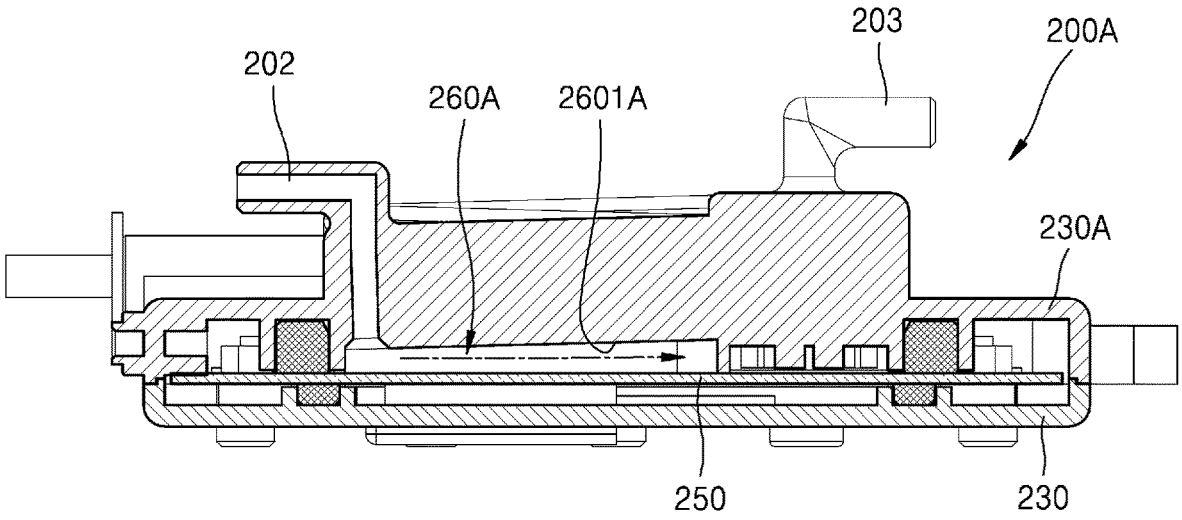
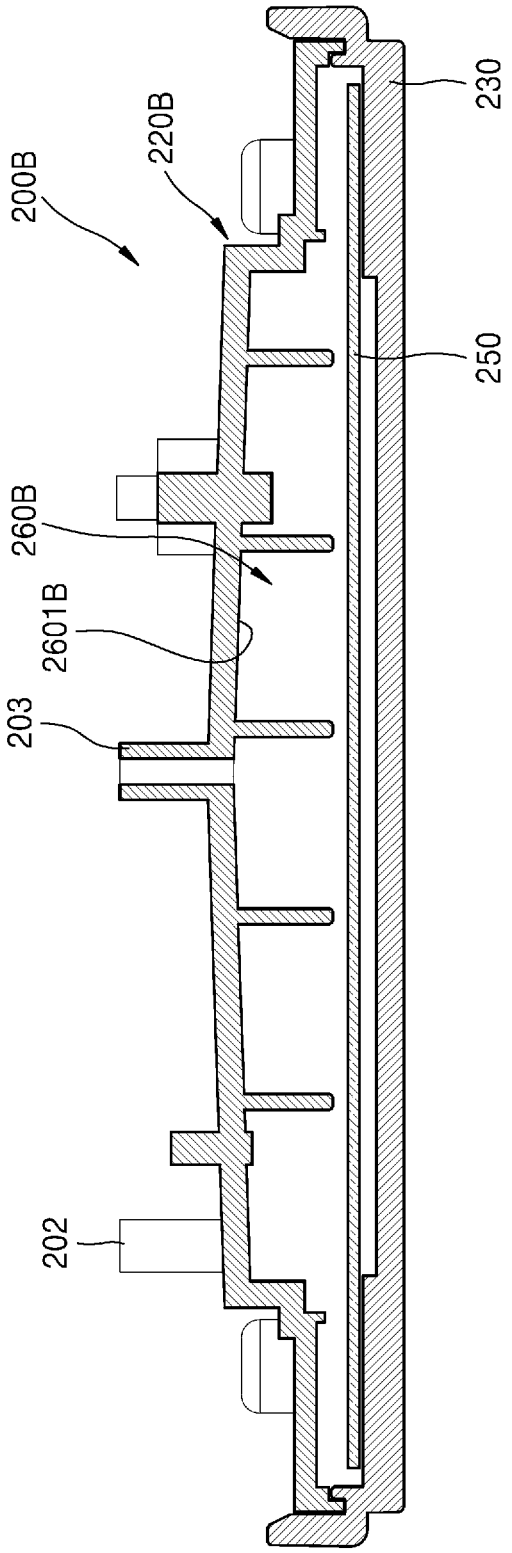


FIG. 18



CLEANER AND MOP BRUSH HEAD

TECHNICAL FIELD

[0001] Embodiments of the disclosure provide a cleaner for cleaning a surface to be cleaned, by spraying water to the surface, and a mop brush head used therein.

BACKGROUND ART

[0002] A cleaner is a device that performs cleaning, and there are various types of cleaners such as a vacuum cleaner that performs cleaning using suction power, a mop cleaner that performs cleaning using water, and a cleaner that uses suction power and water simultaneously or selectively.

[0003] A cleaner that selectively uses suction power and water may be used by changing a brush head configured to contact the surface to be cleaned, depending on the cleaning purpose. For example, a suction brush head may be mounted on the cleaner to use suction power, or a mop brush head may be mounted on the cleaner to use water.

DISCLOSURE

Technical Problem

[0004] According to an embodiment of the disclosure, a cleaner may include a mop brush head, and the mop brush head may include a head body, a mop attachable to the mop brush head so as to be disposed below the head body to contact a surface to be cleaned, and being detachable from the mop brush head, a sprayer configured to spray water toward the surface to be cleaned, a water tank in the head body and configured to store water, a hot water tank having an inlet through which water stored in the water tank flows into the hot water tank, an outlet through which water in the hot water tank flows to the sprayer, and a channel structure having a plurality of channels inside the hot water tank so that water in the hot water tank moves along a preset path through the plurality of channels from the inlet to the outlet, and a heater configured to heat the water in the hot water tank.

[0005] According to an embodiment of the disclosure, the hot water tank, the channel structure, and the heater may be configured so that water in the hot water tank is heated by the heater as the water moves along the preset path through the plurality of channels of the channel structure, and a temperature difference in the water sprayed by the sprayer is within 10% of a maximum temperature of the sprayed water.

[0006] According to an embodiment of the disclosure, the plurality of channels may be parallel with each other, and adjacent channels of the plurality of channels may be connected to each other.

[0007] According to an embodiment of the disclosure, a width of each channel of the plurality of channels may be smaller than a width of the hot water tank.

[0008] According to an embodiment of the disclosure, the channel structure may include a channel wall extending in a vertical direction, and a lower end of the channel wall may be spaced apart from the heater.

[0009] According to an embodiment of the disclosure, an upper surface of the channel structure may have a varying height in order to induce gas movement inside the hot water tank.

[0010] According to an embodiment of the disclosure, heights of upper surfaces of the plurality of channels respectively may increase along at least a portion a flow path through which water moves in the hot water tank from the inlet to the outlet.

[0011] According to an embodiment of the disclosure, the mop brush head may further include a lower case supporting the heater, an upper case coupled to the lower case, with the heater and the hot water tank therebetween, and a gasket between the lower case and the upper case to provide a seal between the lower case and the upper case.

[0012] According to an embodiment of the disclosure, the heater may have a flat upper surface.

[0013] According to an embodiment of the disclosure, the mop brush head may further include at least one of a temperature sensor configured to measure a temperature of water in the hot water tank, a water level sensor configured to measure a level of water in the hot water tank, and a power cutoff portion configured to selectively adjust power supplied to the heater according to temperature of the heater.

[0014] According to an embodiment of the disclosure, the cleaner may further include a main body, a battery in the main body, an extension tube configured to connect the main body and the mop brush head to each other, and a wire having at least a portion disposed in the extension tube and configured to transmit power of the battery to the mop brush head to power the heater.

[0015] According to an embodiment of the disclosure, the extension tube may have a length-adjustable structure, and the wire may have an allowable current of 5 A (ampere) or less.

[0016] According to an embodiment of the disclosure, the cleaner may further include a pump configured to provide pressure to move water from the water tank to the sprayer, wherein the cleaner may be configured to operate the pump and the heater at different times.

[0017] According to an embodiment of the disclosure, the mop brush head may further include a filter structure inside the hot water tank and configured to block foreign substances generated during heating of water in the hot water tank from moving to the outlet.

[0018] According to an embodiment of the disclosure, a mop brush head is for use with a cleaner, and the mop brush head may include a head body, a mop attachable to the mop brush head so as to be disposed below the head body to contact a surface to be cleaned, and being detachable from the mop brush head, a sprayer configured to spray water toward the surface to be cleaned, a water tank in the head body and configured to store water, a hot water tank having an inlet through which water stored in the water tank flows into the hot water tank, an outlet through which water in the hot water tank flows to the sprayer, and a channel structure having a plurality of channels inside the hot water tank so that water in the hot water tank moves along a preset path through the plurality of channels from the inlet to the outlet, and a heater configured to heat the water in the hot water tank.

DESCRIPTION OF DRAWINGS

[0019] FIG. **1** is a perspective view illustrating a cleaner according to an embodiment of the disclosure.

[0020] FIG. **2** is a perspective view illustrating a main body of a cleaner according to an embodiment of the disclosure.

[0021] FIG. **3** is a cross-sectional view illustrating an extension tube of a cleaner according to an embodiment of the disclosure.

[0022] FIG. **4** is a perspective view illustrating the cleaner of FIG. **1**, in which a suction brush head is replaced with a mop brush head.

[0023] FIG. **5** is a perspective view illustrating a mop brush head according to an embodiment of the disclosure.

[0024] FIG. **6** is a perspective view of the mop brush head of FIG. **5**, which is partially separated.

[0025] FIG. **7** is a perspective view for describing a bottom surface of the mop brush head of FIG. **5**.

[0026] FIG. **8** illustrates a portion of a mop brush head according to an embodiment of the disclosure.

[0027] FIG. **9** is a front view of a heating module of a mop brush head according to an embodiment of the disclosure, viewed from the front.

[0028] FIG. **10** is an example of an exploded perspective view of the heating module of FIG. **9**.

[0029] FIG. **11** illustrates a cross-section of a heating module according to an embodiment of the disclosure, cut in a horizontal direction.

[0030] FIGS. **12**A to **12**D are diagrams for describing the process of water inflow, water heating, and water outflow from a hot water tank, according to an embodiment of the disclosure.

[0031] FIGS. **13**A and **13**B are diagrams for describing a modified example of a filter structure in the heating module of FIG. **11**.

[0032] FIG. **14** is a cross-sectional view of the heating module according to an embodiment of the disclosure, cut in a vertical direction.

[0033] FIG. **15** is a perspective view illustrating an example of a heating module according to an embodiment of the disclosure.

[0034] FIG. **16** is a cross-sectional view of the heating module of FIG. **15**, cut in a horizontal direction.

[0035] FIG. **17** is a cross-sectional view of the heating module of FIG. **15**, cut in a vertical direction.

[0036] FIG. **18** is a cross-sectional view of a heating module according to an embodiment of the disclosure, cut in a vertical direction.

MODE FOR INVENTION

[0037] Hereinafter, embodiments according to the disclosure will be described in detail with reference to the contents depicted in the attached drawings. The same reference numbers or symbols shown in each drawing indicate parts or components that perform substantially the same function.

[0038] Terms containing ordinal numbers, such as "first," "second," etc., may be used to describe various components, but the components are not limited by the terms. Terms are used only to distinguish one component from another. For example, a first component may be named a second component, and similarly, the second component may also be named a first component without departing from the scope of the disclosure. The term "and/or" includes a combination of a plurality of related items or any one item among a plurality of related items.

[0039] The terms used in this application are used to describe embodiments and are not intended to limit and/or limit the disclosure. Singular expressions include plural expressions unless the context clearly dictates otherwise. In this application, terms such as "comprise" or "have" are intended to designate the presence of features, numbers, steps, operations, components, parts, or combinations thereof described in the specification, but are not intended to indicate the presence of one or more other features. It should be understood that this does not exclude in advance the possibility of the existence or addition of elements, numbers, steps, operations, components, parts, or combinations thereof. The same reference numerals in each drawing indicate members that perform substantially the same function.

[0040] Terminology such as "at least one of A and B", as used herein, includes any of the following: A, B, A and B. Similarly, terminology such as "at least one of A, B, and C", as used herein, includes any of the following: A, B, C, A and B, A and C, B and C, A and B and C.

[0041] FIG. **1** is a perspective view illustrating a cleaner **1** according to an embodiment of the disclosure. FIG. **2** is a perspective view illustrating a main body of the cleaner **1** according to an embodiment of the disclosure. FIG. **3** is a cross-sectional view illustrating an extension tube **40** of the cleaner **1** according to an embodiment of the disclosure, and FIG. **4** is a perspective view of the cleaner **1**, in which a suction brush head **10** replaced with a mop brush head **100**.

[0042] Referring to FIGS. **1** and **2**, the cleaner **1** may include a main body **20** that provides suction power, the suction brush head **10** that sucks in foreign substances from a surface to be cleaned, by using the suction power provided by the main body **20**, and the extension tube **40** connecting the main body **20** to the suction brush head **10**.

[0043] The main body **20** may include a motor (not shown) that generates suction power and a dust collector **30** that accommodates foreign substances sucked in by the suction brush head **10**.

[0044] The dust collector **30** may use a cyclone method, but this is only an example, and the type of method applied to the dust collector **30** is not limited. The dust collector **30** is provided in the form of a container in which centrifuged foreign substances are accommodated. The dust collector **30** may be detachably coupled to the main body **20**.

[0045] The main body **20** may include a discharge portion **21** that discharges air sucked into the main body **20** to the outside. The discharge portion **21** includes a plurality of holes provided on the outside of the main body **20**. The dust collector **30** is coupled to a lower portion of the discharge portion **21**. When air is sucked into the main body **20** through a suction nozzle **50**, dust contained in the air is collected and stored in the dust collector **30**, and dust-filtered air is discharged out of the main body **20** through the discharge portion **21**.

[0046] The suction brush head **10** may be provided to suck in foreign substances from the surface to be cleaned, for example, the floor, together with air, by using suction power. While moving in contact with the surface to be cleaned, the suction brush head **10** is provided to suck in various foreign substances such as dust, fine dust, and hair present on the surface to be cleaned. The suction brush head **10** may include a brush and a motor for rotating the brush.

[0047] The extension tube **40** transmits suction power generated by the main body **20** and transfers foreign substances sucked in from the suction brush head **10** to the main body **20**.

[0048] Referring to FIGS. **1** and **3**, the extension tube **40** may have a length-adjustable structure. For example, the extension tube **40** includes a first pipe **41** connected to the

main body **20** and a second pipe **42** connected between the first pipe **41** and the suction brush head **10**. The extension tube **40** has a double-pipe shape. A diameter of the first pipe **41** is smaller than a diameter of the second pipe **42**, and as an end of the first pipe **41** slides while being accommodated in the second pipe **42**, the entire length of the extension tube **40** may be adjusted.

[0049] A wire **43** for electrical connection between the main body **20** and the suction brush head **10** may be arranged in the extension tube **40**. The wire **43** may be used for electrical connection between the mop brush head **100** and the main body **20**, which will be described later.

[0050] The wire **43** may be arranged such that it is not exposed to the outside of the extension tube **40**. For example, a portion **431** of the wire **43** may be arranged inside a first receiving portion **411** of the first pipe **41**, and another portion **432** of the wire **43** may be disposed inside a second receiving portion **421** of the second pipe **42**.

[0051] In consideration of adjusting the length of the extension tube **40**, the length of the other portion **432** of the wire **43** disposed in the second receiving portion **421** may be longer than the length of the second pipe **42**. The wire **43** disposed in the second receiving portion **421** may be bent. For example, the other portion **432** of the wire **43** disposed in the second receiving portion **421** may be bent into a coil shape.

[0052] Considering the appearance of the product, the size of the second receiving portion **421** may be limited. Accordingly, in order for the wire **43** disposed in the second receiving portion **421** of a limited size to be bent, the size, diameter, or allowable current of the wire **43** may be limited. For example, the standard of the wire **43** may be AWG 19 or larger. For example, the diameter of the wire **43** may be 1 mm or less. For example, the allowable current of the wire **43** may be 5 A (ampere) or less.

[0053] Regarding the extension tube **40** according to the embodiment of the disclosure described above, the extension tube **40** having a length-adjustable structure is illustrated, but is not necessarily limited thereto. For example, the extension tube **40** may have a structure with a fixed length. For example, the extension tube **40** may be composed of a pipe of a fixed length and the wire **43** disposed inside the pipe. Here, because the wire **43** disposed in the extension tube **40** does not need to be bent, the wire **43** may be freely selected.

[0054] The main body **20** includes the suction nozzle **50** to which the extension tube **40** is connected. The suction nozzle **50** has a suction port formed therethrough so that the extension tube **40** may be inserted, and the air sucked in from the extension tube **40** is delivered to the inside of the main body **20** through this suction port. The suction nozzle **50** is formed by inserting and connecting the extension tube **40** in a longitudinal direction of the extension tube **40**. The suction nozzle **50** includes a nozzle connector **60** to which the extension tube **40** may be detachably connected.

[0055] The main body **20** includes a handle **70** that may be held by a user. The user may hold the handle **70** and move the main body **20** and the suction brush head **10**.

[0056] The main body **20** may include a battery **80** that supplies power to the cleaner **1**. The cleaner **1** including the battery **80** may be used wirelessly without a wired connection. That is, the cleaner **1** may be a wireless cleaner.

[0057] Referring to FIGS. **1** and **4**, the cleaner **1** according to the embodiment of the disclosure may be used by replacing the suction brush head **10** with the mop brush head **100** for cleaning of the surface to be cleaned, with water. A detailed description of the mop brush head **100** will be described later.

[0058] The suction brush head **10** may be replaceably coupled to a front end of the extension tube **40**, for example, to a front end of the second pipe **42**. In an embodiment of the disclosure, the suction brush head **10** may be separated from the front end of the extension tube **40**, and the mop brush head **100**, which will be described later, may be installed instead.

[0059] Referring back to FIGS. **1** and **2**, the main body **20** includes a manipulation unit **90** that allows a user to control the operation of the cleaner **1**. The manipulation unit **90** is an input interface that may be operated by a user and is implemented as a mechanical or electronic button. The user may control the suction operation or the cleaning operation with water, of the cleaner **1**, by manipulating the manipulation unit **90**. The cleaner **1** may switch between a suction cleaning mode and a mop cleaning mode, according to which brush head is coupled to the extension tube **40**. Depending on the operation mode of the cleaner **1**, the same button operation of the manipulation unit **90** may perform different operations.

[0060] FIG. **5** is a perspective view illustrating the mop brush head **100** according to an embodiment of the disclosure, and FIG. **6** is a perspective view of the mop brush head **100** of FIG. **5**, which is partially separated. FIG. **7** is a perspective view for describing a bottom surface of the mop brush head **100** of FIG. **5**. FIG. **8** is a diagram illustrating a portion of the mop brush head **100** according to an embodiment of the disclosure. FIG. **9** is a front view of a heating module **200** of the mop brush head **100** according to an embodiment of the disclosure, and FIG. **10** is an example of an exploded perspective view of the heating module **200** of FIG. **9**.

[0061] Referring to FIGS. **5** to **8**, the mop brush head **100** sprays water to a surface to be cleaned, and a mop **123** repeatedly contacts the surface to be cleaned, to perform cleaning on the surface to be cleaned, with water.

[0062] The mop brush head **100** may include a head body **110**, at least one mop **123** disposed to be in contact with the surface to be cleaned, under the head body **110**, a sprayer **140** disposed in front of the head body **110**, a water tank **150** configured to store water, and a pump **160** disposed between the sprayer **140** and the water tank **150** and providing pressure so that the sprayer **140** sprays water.

[0063] The head body **110** may include a brush body **120** and a brush connection portion **130** provided to be mounted at the front end of the extension tube **40**. The brush connection portion **130** may be connected to the brush body **120** such that its angle is adjustable.

[0064] The brush body **120** may include a pair of rotating disks **121** provided on lower surfaces of both left and right sides thereof. The rotating disks **121** may include a mop attachment portion **122** for detachably attaching the mop **123** to a lower surface thereof facing the floor. Depending on the material of the mop **123**, the mop attachment portion **122** may be implemented in various structures such as an adhesive pad or Velcro.

[0065] The mop **123** may include various fiber or plastic materials designed for cleaning. While being in contact with the surface to be cleaned, the mop **123** is rotated by the rotating disk **121**, thereby performing cleaning by the mop

123 in the process. In the embodiment of the disclosure, a structure in which the mop **123** is rotated is illustrated, but the structure is not necessarily limited thereto. For example, although not shown, the mop **123** may be fixed to the brush body **120** without being rotated.

[0066] The brush body **120** may include a base frame **125** that supports the rotating disk **121** and an upper cover **126** that is detachably coupled to the base frame **125**. The base frame **125** rotatably supports the rotating disk **121**, and the heating module **200** to be described later may be installed on the base frame **125**. The upper cover **126** has a function of covering components installed on the base frame **125**, such as the heating module **200**, so that the components are not exposed, and may form the upper exterior of the mop brush head **100**. An edge frame **127** may be disposed between the base frame **125** and the upper cover **126**, and a controller **273** may be supported on the edge frame **127**. The shape and structure of the brush body **120** are an example and may be modified in various manners as needed.

[0067] The water tank **150** may be arranged in the head body **110**. For example, the water tank **150** may be detachably coupled to the brush connection portion **130** of the head body **110**. Water stored in the water tank **150** may be greater than a water spray amount sprayed once by the sprayer **140** (hereinafter referred to as 'water spray amount'). For example, a storage capacity of water that may be stored in the water tank **150** may be 30 times or more the water spray amount. For example, the storage capacity of the water tank **150** may be 50 times or more the water spray amount. However, considering the size of the mop brush head **100**, the storage capacity of the water tank **150** may be 100 times or less the water spray amount.

[0068] The sprayer **140** may be disposed in front of the brush body **120**. The sprayer **140** may be arranged in front of the mop **123**. The sprayer **140** may spray water directly to the surface to be cleaned. The sprayer **140** may spray water ahead of a movement path of the mop **123**. The pump **160** that provides pressure to move water from the water tank **150** to the sprayer **140** may be disposed in the brush body **120**.

[0069] A water supply pipe that provides at least a portion of a movement path of water from the water tank **150** to the sprayer **140** may be disposed in the brush body **120**. The water supply pipe may include a first water supply pipe **171** connected between the water tank **150** and the pump **160**, and a second water supply pipe **172** connected between the pump **160** and the sprayer **140**.

[0070] The mop brush head **100** according to the embodiment of the disclosure may further include the heating module **200** that heats water supplied from the water tank **150**. The heating module **200** may be disposed between the pump **160** and the sprayer **140** in the brush body **120**. The heating module **200** is disposed between the water tank **150** and the sprayer **140** and may be configured to heat water supplied from the water tank **150**. The heating module **200** may be configured to heat water before the water is sprayed by the sprayer **140**.

[0071] As the mop brush head **100** includes the heating module **200**, high-temperature water may be sprayed from the sprayer **140** onto the surface to be cleaned. High-temperature water sprayed on the surface to be cleaned may quickly soak foreign substances on the surface to be cleaned, and the soaked foreign substances may be easily removed using the mop **123**.

[0072] The heating module **200** may be arranged close to the sprayer **140**. For example, the heating module **200** may be disposed close to the sprayer **140** between the water tank **150** and the sprayer **140**. The heating module **200** may be disposed between the pump **160** and the sprayer **140**. The second water supply pipe **172** may include a third water supply pipe **173** connecting the pump **160** and the heating module **200** to each other, and a fourth water supply pipe **174** connecting the heating module **200** and the sprayer **140** to each other.

[0073] Referring to FIGS. **8** to **10**, the heating module **200** may include a module case **210** and a heater **250** disposed inside the module case **210**. The module case **210** supports the heater **250**, and a hot water tank **201** may be provided thereinside.

[0074] The module case **210** may include a lower case **230**, an upper case **220** coupled to the lower case **230**, and a gasket **240** disposed between the lower case **230** and the upper case **220**. The upper case **220** may be coupled to the lower case **230** with the heater **250** therebetween.

[0075] The heater **250** may be disposed in the lower case **230**. The heater **250** may be fixed to the lower case **230** by using fixing members **2341** and **2342**. As examples of the fixing members **2341** and **2342**, bolts and nuts are described as examples, but are not limited thereto, and the structure for fixing the heater **250** to the lower case **230** may be modified in various manners.

[0076] In the lower case **230**, a power connection portion **231** for supplying current to the heater **250** and a power cutoff portion **232**, which will be described later, may be provided below the heater **250**. The power connection portion **231** may be connected to the controller **273** (see FIG. **6**) through a second wire **233**.

[0077] The heater **250** may form the bottom surface of the hot water tank **201**. The hot water tank **201** may be defined by an upper surface of the heater **250**, an inner surface of the gasket **240**, and an inner peripheral surface of the upper case **220**. However, the structure for forming the hot water tank **201** is not limited thereto, and may be modified in various manners as long as the structure is to provide a space for heating certain water inside the module case **210**.

[0078] The module case **210** may be provided with an inlet **202** for supplying water to the hot water tank **201** and an outlet **203** for discharging water from the hot water tank **201**. For example, the inlet **202** and the outlet **203** may be provided at a higher position than the heater **250**. For example, the inlet **202** and the outlet **203** may be provided in the upper case **220**. However, the arrangement of the inlet **202** and the outlet **203** is not limited thereto, and may be modified in various manners as long as the arrangement is for supplying and discharging water to the hot water tank **201**. An end of the third water supply pipe **173** may be connected to the inlet **202**, and an end of the fourth water supply pipe **174** may be connected to the outlet **203**.

[0079] The hot water tank **201** stores water supplied from the water tank **150**, and the water stored in the hot water tank **201** may be heated by the heater **250**. A storage capacity of the hot water tank **201** may be designed to be smaller than that of the water tank **150** in consideration of the power usage of the heater **250**. For example, the storage capacity of the hot water tank **201** may be 1/30 times or less the storage capacity of the water tank **150**. For example, the storage capacity of the hot water tank **201** may be 1/50 times or less the storage capacity of the water tank **150**.

[0080] The storage capacity of the hot water tank **201** may be equal to or greater than the spray amount of the sprayer **140**. For example, the storage capacity of the hot water tank **201** may be twice or more the spray amount of the sprayer **140**.

[0081] The heater **250** may be arranged below the hot water tank **201**. The heater **250** may have a flat plate shape. For example, the heater **250** may have a flat upper surface. The heater **250** may have a relatively small thickness. For example, the thickness of the heater **250** may be 2 mm or less. For example, the thickness of the heater **250** may be 1.5 mm or less. For example, the thickness of the heater **250** may be about 0.5 mm to about 1.5 mm.

[0082] The heater **250** may include a heat source **251** and a conductive plate **252**.

[0083] The heat source **251** may be in the form of a metal wire. The heat source **251** may include a metal material and may have a certain pattern. However, the heat source **251** is not limited thereto. For example, the heat source **251** may be a carbon nanotube film. The thickness of the heat source **251** may be 0.5 mm or less. The thickness of the heat source **251** may be smaller than the thickness of the conductive plate **252**. The thickness of the heat source **251** may be equal to or less than ½ the thickness of the conductive plate **252**.

[0084] The conductive plate **252** may perform a function of transferring heat generated from the heat source **251**, to the hot water tank **201**. The conductive plate **252** may block contact between water in the hot water tank **201** and the heat source **251**. The conductive plate **252** may be disposed between the heat source **251** and the hot water tank **201**.

[0085] The conductive plate **252** may have a flat upper surface. Because the conductive plate **252** is exposed to water, the conductive plate **252** may include a material that does not rust. For example, the conductive plate **252** may include stainless steel. The thickness of the conductive plate **252** may be 2 mm or less. The thickness of the conductive plate **252** may be about 0.5 mm to about 1.5 mm.

[0086] The heater **250** may be installed in the module case **210** such that the upper surface of the conductive plate **252** forms the bottom surface of the hot water tank **201**.

[0087] The maximum temperature of the heater **250** may be 200° C. or less. The normal operating temperature of the heater **250** may be 120° C. or less. The normal operating temperature of the heater **250** may be 100° C. or less. However, when the heater **250** operates abnormally and overheats, the temperature of the heater **250** may rise to 200° C.

[0088] The water stored in the hot water tank **201** may be heated by the heater **250**. The temperature of the water stored in the hot water tank **201** may be high. For example, the temperature of water stored in the hot water tank **201** may be higher than room temperature. For example, the temperature of water stored in the hot water tank **201** may be 40° C. or higher. For example, the temperature of water stored in the hot water tank **201** may be 50° C. or higher.

[0089] The temperature of the water stored in the hot water tank **201** may be equal to or lower than a certain temperature to prevent damage to the surface to be cleaned or burns to the human body due to the water sprayed by the sprayer **140**. For example, the temperature of water stored in the hot water tank **201** may be 60° C. or lower. For example, the temperature of water stored in the hot water tank **201** may be about 50° C. to about 60° C.

[0090] The current used by the heater **250** may be determined by considering the allowable current of the wire **43**. The current used by the heater **250** may be equal to or less than 70% of the allowable current of the wire **43**. For example, when the allowable current of the wire **43** is 4.5 A, the current used by the heater **250** may be 3.0 A or less.

[0091] The heating module **200** may include a component to prevent overheating of the heater **250**. For example, the heating module **200** may include at least one of a temperature sensor **271**, a water level sensor **272**, and the power cutoff portion **232**.

[0092] For example, the heating module **200** may include the temperature sensor **271** that detects the internal temperature of the hot water tank **201**. The temperature sensor **271** may detect the temperature of water stored in the hot water tank **201**. The temperature sensor **271** may be provided at a higher position than the heater **250**. The temperature sensor **271** may be provided in the upper case **220**. However, the arrangement of the temperature sensor **271** is not limited thereto and may be provided in various locations.

[0093] The heating module **200** may further include the water level sensor **272** for detecting the water level of the hot water tank **201**. The water level sensor **272** may be provided at a higher position than the heater **250**. The water level sensor **272** may be provided in the upper case **220**. However, the arrangement of the water level sensor **272** is not limited thereto, and may be provided in various locations.

[0094] The controller **273** (see FIG. **6**) may control the operation of the heater **250** based on the temperature of the water detected by the temperature sensor **271**. For example, when the temperature of the water in the hot water tank **201** is outside a predetermined range, the operation of the heater **250** may be stopped. For example, when the temperature of the water in the hot water tank **201** exceeds a reference temperature, the operation of the heater **250** may be stopped. For example, when the temperature of the hot water tank **201** exceeds 60° C., the operation of the heater **250** may be stopped.

[0095] The controller **273** may control the operation of the heater **250** based on the water level of the hot water tank **201** detected by the water level sensor **272**. For example, when the water level sensor **272** determines that the hot water tank **201** is not filled with water, the controller **273** may not operate the heater **250**. Accordingly, overheating of the heater **250**, which may occur when the heater **250** is operated while the hot water tank **201** is not filled with water, may be prevented.

[0096] The heating module **200** may further include the power cutoff portion **232** to prevent overheating of the heater **250**. The power cutoff portion **232** may cut off power supplied to the heater **250** when the temperature of the heater **250** rises above a predetermined temperature. For example, the power cutoff portion **232** may include a bimetal having a shape that changes depending on the temperature of the heater **250**. The shape of the bimetal of the power cutoff portion **232** may change according to the temperature of the heater **250**, and thus, the power cutoff portion **232** may physically block power transmitted to the heater **250**.

[0097] In the embodiment of the disclosure described above, the heating module **200** has been described as including all of the temperature sensor **271**, the water level sensor **272**, and the power cutoff portion **232**, but is not limited thereto. For example, in the heating module **200**, some of the

temperature sensor **271**, the water level sensor **272**, and the power cutoff portion **232** may be omitted, when necessary.

[0098] As described above, the water stored in the hot water tank **201** of the heating module **200** is heated by the heater **250**. As the pump **160** operates in this state, heated water may be sprayed by the sprayer **140** via the outlet **203** and the fourth water supply pipe **174**.

[0099] However, in the process in which the water in the hot water tank **201** is sprayed by the sprayer **140**, as the pump **160** is operated, a portion of heated water (hereinafter referred to as 'high-temperature water HW') flows out from the hot water tank **201** through the outlet **203**, and at the same time, unheated water (hereinafter referred to as 'low-temperature water LW') flows through the inlet **202** in an equal amount to the amount of the water flowed out through the outlet **203**. In this process, newly introduced low-temperature water LW is mixed with high-temperature water HW, and the temperature of the water stored in the hot water tank **201** may drop. Accordingly, in the process where the high-temperature water HW is sprayed from the sprayer **140**, the temperature of the water sprayed at the end of the spraying process may be lower than the temperature of the water sprayed at the beginning of the spraying process. For example, in the process of spraying water once by the sprayer **140**, the temperature difference in the water may be 10° C. or more.

[0100] In the mop brush head **100** according to the embodiment of the disclosure, in order to reduce the temperature difference in the sprayed water, the heating module **200** may include a channel structure **260** that guides a movement path of water inside the hot water tank **201**.

[0101] FIG. **11** illustrates a cross-section of the heating module **200** according to an embodiment of the disclosure, cut in a horizontal direction. FIGS. **12**A to **12**D are diagrams for describing the process of water inflow, water heating, and water outflow from the hot water tank **201**, according to an embodiment of the disclosure. FIGS. **13**A and **13**B are diagrams for describing a modified example of filter structures **221**A and **221**B in the heating module **200** of FIG. **11**.

[0102] Referring to FIGS. **10** and **11**, the channel structure **260** may be configured such that low-temperature water LW and high-temperature water HW do not immediately mix. In other words, the channel structure **260** may delay the mixing time of low-temperature water LW and high-temperature water HW. For example, the channel structure **260** may reduce the contact area between low-temperature water LW and high-temperature water HW.

[0103] For example, the channel structure **260** may include a plurality of channels CH arranged in parallel with each other. Each of the plurality of channels CH may extend in a first direction and may be arranged in a second direction perpendicular to the first direction. For example, the plurality of channels CH may extend in a width direction of the hot water tank **201** and may be arranged in the longitudinal direction of the hot water tank **201**. A width W**1** of each of the plurality of channels CH may be smaller than a width W**0** of the hot water tank **201**.

[0104] A channel CH may be connected to an adjacent channel CH thereto. Adjacent channels CH may be connected to each other to allow water to move in a certain direction. An end of the channel CH may be connected to an adjacent channel CH. In other words, the channel structure **260** may have channels CH that meander from the inlet **202** toward the outlet **203**.

[0105] The channel structure **260** may be provided in the upper case **220**. The channel structure **260** may have a shape that protrudes from the inner surface of the upper case **220**.

[0106] The channel structure **260** may include at least one channel wall **261** forming the channel CH through which water flowing in through the inlet **202** moves toward the outlet **203**. The channel wall **261** may extend in a vertical direction. The channel wall **261** may extend toward the heater **250**. The channel wall **261** may extend from an upper portion of the inner surface of the upper case **220** toward a lower portion thereof.

[0107] There may be a plurality of channel walls **261**. The plurality of channel walls **261** may be arranged in parallel in the longitudinal direction of the hot water tank **201**. As another example, the plurality of channel walls **261** may be arranged in parallel in a width direction perpendicular to the longitudinal direction of the hot water tank **201**. The plurality of channel walls **261** may be arranged in a staggered pattern with respect to each other. However, the number of channel walls **261** is not limited to a plurality, and there may be a single channel wall **261**.

[0108] The process in which water flows into the hot water tank **201** and is heated and the process in which water flows out of the hot water tank **201** in the heating module **200** having the channel structure **260** as described above will be described.

[0109] Referring back to FIG. **8**, as the pump **160** is operated, the low-temperature water LW stored in the water tank **150** passes through the first water supply pipe **171** and the third water supply pipe **173** and flows into the inlet **202** of the hot water tank **201**, and the high-temperature water HW stored in the hot water tank **201** is discharged through the outlet **203**. The high-temperature water HW discharged through the outlet **203** of the hot water tank **201** passes through the fourth water supply pipe **174** and is sprayed through the sprayer **140**.

[0110] Referring to FIG. **12**A, the low-temperature water LW flows into the hot water tank **201** through the inlet **202**. After the low-temperature water LW is introduced, the heater **250** may operate to heat the low-temperature water LW. As the heater **250** operates, the low-temperature water LW flowing into the hot water tank **201** may be heated and converted into the high-temperature water HW, as illustrated in FIG. **12**B. The inside of the hot water tank **201** may be filled with the high-temperature water HW.

[0111] In this state, as the pump **160** operates, the high-temperature water HW filled in the hot water tank **201** is discharged through the outlet **203**, as illustrated in FIG. **12**C. The water filled in the channel CH adjacent to the outlet **203** is first discharged through the outlet **203**. As illustrated in FIG. **12**D, the low-temperature water LW is introduced through the inlet **202** as much as the high-temperature water HW is discharged through the outlet **203**. The introduced low-temperature water LW is mixed with the high-temperature water HW inside the hot water tank **201**, but because the contact area is limited by the width of the channel CH, the time that the low-temperature water LW and high-temperature water HW are mixed with each other may be delayed. Thus, even when the high-temperature water HW filled in the channel CH relatively distant from the outlet **203** is sprayed through the outlet **203**, the temperature drop of the sprayed high-temperature water HW may be minimized. For example, even when the hot water HW filled in a first position P**1** and the high-temperature water HW filled in a

second position P2 are sequentially discharged from the hot water tank **201**, the temperature difference may not be large. For example, when the high-temperature water HW filled in the first position P1 and the high-temperature water HW filled in the second position P2 are discharged through the sprayer **140**, the temperature difference may be within 10% of the temperature of the high-temperature water HW filled in the first position P1. For example, when the temperature of the high-temperature water HW filled in the first position P1 is 60° C., the temperature of the high-temperature water HW filled in the second position P2 may be 55° C.

[0112] As described above, as the channel structure **260** is formed in the heating module **200**, the temperature of the water sprayed by the sprayer **140** may be kept constant at a high temperature. For example, the temperature difference of the water sprayed by the sprayer **140** may be within 10% of the maximum temperature. For example, in the process of one-time spraying by the sprayer **140**, when the initial temperature is 60° C., the latter temperature may be 55° C. When the initial temperature is the maximum temperature of 60° C., the temperature deviation is 5° C., which may be within 10% of 60° C.

[0113] Referring to FIGS. **11** and **12**A-**12**D, a filter structure **221** may be provided inside the hot water tank **201** to block foreign substances generated in the process of heating water, from moving to the outlet **203**. For example, limescale may be formed when the water is heated. The filter structure **221** may filter out limescale generated in the process of heating water. Through this, clogging of the sprayer **140** due to foreign substances such as limescale may be prevented.

[0114] For example, the filter structure **221** may have a structure surrounding the outlet **203**. For example, the filter structure **221** may include a plurality of ribs **2210** arranged at certain intervals. The plurality of ribs **2210** may be spaced apart from each other along a circumferential direction. However, the shape of the filter structure **221** is not limited thereto, and may be modified in various manners depending on the location of the outlet **203**, the flow of fluid, etc. For example, as illustrated in FIGS. **13**A and **13**B, the filter structures **221**A and **221**B may have the plurality of ribs **2210** arranged in a semicircular shape, a straight line shape, etc., so that the filter structures **221**A and **221**B are disposed on a movement path toward the outlet **203**.

[0115] FIG. **14** is a cross-sectional view of the heating module **200** according to the embodiment of the disclosure, cut in a vertical direction. FIG. **14** illustrates an enlarged portion of the heating module **200**.

[0116] Referring to FIG. **14**, the channel structure **260** may be spaced apart from the heater **250**. In other words, the channel structure **260** and the heater **250** may not be in contact with each other. For example, the channel structure **260** may be spaced apart from the heater **250** in a vertical direction. For example, the channel structure **260** may be spaced apart from a lower end of the channel wall **261** and the heater **250**. Because a surface of the heater **250** is considerably hot, the channel structure **260** may be damaged or deformed when the channel structure **260** contacts the surface of the heater **250**. On the other hand, as the heater **250** and the channel structure **260** are spaced apart from each other, problems that occur when the channel structure **260** contacts the heater **250** may be eliminated.

[0117] A gap G between the channel structure **260** and the heater **250** may be relatively small. For example, the gap G between the channel structure **260** and the heater **250** may be about 0.5 mm to about 1 mm. By reducing the gap G between the channel structure **260** and the heater **250**, the movement of water between the channel structure **260** and the heater **250** may be reduced. Accordingly, most of the water in the hot water tank **201** may move along the longitudinal direction of the channel CH.

[0118] Meanwhile, air bubbles may exist in the hot water tank **201**. For example, as water flows into the hot water tank **201**, bubbles may be introduced, or as the water is heated, gas contained in the water may rise and form bubbles. Air bubbles may be located in an upper portion of the hot water tank **201**. When these bubbles are around the temperature sensor **271**, they may cause measurement errors in the temperature sensor **271**. In addition, when these bubbles intermittently move to the outlet **203**, water may not be continuously sprayed from the sprayer **140**, which may deteriorate spray quality.

[0119] In the heating module **200** according to the embodiment of the disclosure, the height of at least a portion of an upper surface **2601** of the channel structure **260** may vary in order to induce gas movement inside the hot water tank **201**. For example, the upper surface **2601** of the channel structure **260** may increase in height along the flow path through which water moves. For example, the upper surface **2601** of the channel structure **260** may have a certain inclination θ with respect to a horizontal direction. For example, the upper surface **2601** of the channel structure **260** may be inclined toward the outlet **203**. For example, the upper surface **2601** of the channel structure **260** may increase in height toward the outlet **203**. In other words, the height of upper surfaces of the plurality of channels CH may increase along the flow path through which water moves. The upper surface **2601** of the channel structure **260** may be entirely inclined toward the outlet **203**, but is not limited thereto, and may be partially inclined toward the outlet **203**.

[0120] Through the structure of the upper surface **2601** of the channel structure **260**, air bubbles in the hot water tank **201** may be induced to move toward the outlet **203**, and the air bubbles moved toward the outlet **203** may be induced to be collected around the outlet **203**. As described above, by controlling the direction of movement of the air bubbles, the air bubbles may be prevented from unintentionally being located around the temperature sensor **271**, and accordingly, measurement errors in the temperature sensor **271** due to the air bubbles may be reduced. Additionally, when air bubbles gather around the outlet **203**, the sprayer **140** may discharge the air bubbles at once, thereby reducing the phenomenon of intermittent spraying of air bubbles from the sprayer **140**.

[0121] Referring to FIGS. **3**, **4**, **6**, and **10**, the heating module **200** may be supplied with power by a battery **80**. As an example of a configuration for this, the wire **43** disposed in the extension tube **40** may be electrically connected to the mop brush head **100**. For example, the heating module **200** and the battery **80** may be electrically connected by the wire **43**, the controller **273**, and the second wire **233**.

[0122] The wire **43** disposed within the extension tube **40** may have a diameter of a certain size or less such that the wire **43** may be bent, in consideration of adjusting the length of the extension tube **40**. Depending on the diameter of the wire **43**, the current or power that may flow through the wire **43** may vary. For example, the wire **43** according to the embodiment of the disclosure may have an allowable current of 4.5 A or less.

[0123] The current or power consumption of the heating module **200** of the mop brush head **100** may be less than or equal to a certain amount. For example, the current used by the mop brush head **100** according to the embodiment of the disclosure may be 4.5 A or less.

[0124] The current used by the mop brush head **100** may include at least one of a current for rotating the mop **123**, a current for operating the heater **250**, and a current for operating the pump **160**. For example, the sum of the current for rotating the mop **123**, the current for operating the heater **250**, and the current for operating the pump **160** may be greater than the current used by the mop brush head **100**. For example, when the current for rotating the mop **123** is 1.5 A or less, the current for operating the heater **250** is 3 A or less, and the current for operating the pump **160** is 0.5 A or less, the maximum value of the sum of the currents may be 5 A. In order to make the current used by the mop brush head **100** smaller than the allowable current of the electric wire **43**, the heater **250** and the pump **160** may be operated at different times. In other words, the heater **250** and pump **160** may be operated sequentially.

[0125] For example, the controller **273** first operates the heater **250** to heat the water in the hot water tank **201**. Then, the controller **273** may stop the operation of the heater **250** and operate the pump **160** to spray heated high-temperature water. When water is sprayed, heated high-temperature water is discharged from the hot water tank **201**, and unheated low-temperature water is introduced. Even when low-temperature water flows into the hot water tank **201**, the temperature of the water in the hot water tank **201** may be prevented from rapidly decreasing because the width of the channel CH is narrow. Accordingly, the water sprayed by the sprayer **140** may have little temperature difference between the beginning and the end of spraying.

[0126] In regard to the heating module **200** according to the above-described embodiment of the disclosure, an example in which the channel CH of the channel structure **260** extends in a direction perpendicular to the longitudinal direction of the hot water tank **201** and the plurality of channels CH are arranged in the longitudinal direction of the hot water tank **201** is described. However, the shape of the channel structure **260** is not limited thereto and may be modified in various manners.

[0127] FIG. **15** is a perspective view illustrating an example of a heating module **200**A according to an embodiment of the disclosure, FIG. **16** is a cross-sectional view of the heating module **200**A of FIG. **15**, cut in a horizontal direction, and FIG. **17** is a cross-sectional view of the heating module **200**A, cut in a vertical direction. FIG. **18** is a cross-sectional view of a heating module **200**B according to an embodiment of the disclosure, cut in the vertical direction.

[0128] Referring to FIGS. **15** and **16**, the heating module **200**A according to the embodiment of the disclosure may include a channel structure **260**A. Because other configurations of the heating module **200**A are substantially the same as the heating module **200** of the above-described embodiment of the disclosure, repeated description will be omitted.

[0129] The channel structure **260**A may include a plurality of channels CH extending in the longitudinal direction of the hot water tank **201**, and the plurality of channels CH may be arranged in the width direction of the hot water tank **201**. The plurality of channels CH may be connected to each other so that water flowing in through the inlet **202** moves toward the outlet **203**.

[0130] Referring to FIGS. **15** to **17**, the channel structure **260**A may be provided in an upper case **220**A of the heating module **200**A. An upper surface **2601**A of the channel structure **260**A may increase in height toward the outlet **203**. The upper surface **2601**A of the channel structure **260**A may increase in height in the direction of water movement in the channel CH. Accordingly, air bubbles in the hot water tank **201** may move toward the outlet **203** along the inclined upper surface **2601**A of the channel structure **260**A.

[0131] The shape of the upper surface **2601**A of the channel structure **260**A is not limited thereto and may vary according to the arrangement of the outlet **203** and the inlet **202**. Referring to FIG. **18**, in an upper case **220**B of the heating module **200**B according to the embodiment of the disclosure, the outlet **203** may be disposed in a center portion of the hot water tank **201** rather than at an end portion thereof. When the outlet **203** is disposed in the center portion of the hot water tank **201**, an upper surface **2601**B of the channel structure **260**B may increase in height toward the center portion.

[0132] In the above-described embodiment of the disclosure, a structure in which the cleaner **1** is used by selectively mounting the suction brush head **10** or the mop brush head **100** is illustrated. However, the cleaner according to the embodiment of the disclosure is not limited thereto. For example, the cleaner **1** according to the embodiment of the disclosure may be a mop cleaner from which the mop brush head **100** is not detachable. For example, the cleaner **1** according to the embodiment of the disclosure may include the mop brush head **100**, and the main body **20** may be in a form that does not provide suction power.

[0133] For the purposes of promoting an understanding of the disclosure, reference has been made to the preferred embodiments illustrated in the drawings, and specific language has been used to describe these embodiments. However, no limitation of the scope of the disclosure is intended by this specific language, and the disclosure should be construed to encompass all embodiments that would normally occur to one of ordinary skill in the art.

[0134] The particular implementations shown and described herein are illustrative examples of the disclosure and are not intended to otherwise limit the scope of the disclosure in any way. For the sake of brevity, conventional electronics, control systems, software development and other functional aspects of the systems may not be described in detail. Furthermore, the connecting lines, or connectors shown in the various figures presented are intended to represent exemplary functional relationships and/or physical or logical couplings between the various elements. It should be noted that many alternative or additional functional relationships, physical connections or logical connections may be present in a practical device. Moreover, no item or component is essential to the practice of the disclosure unless the element is specifically described as "essential" or "critical". Expressions such as "comprising," "including," etc. used herein are used to be understood as terms of the open end of the technology.

[0135] The use of the terms "a" and "an" and "the" and similar referents in the context of describing the disclosure (especially in the context of the following claims) are to be construed to cover both the singular and the plural. Further-

more, recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. Finally, the steps of all methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The disclosure is not necessarily limited by the order of description of the above steps. The use of any and all examples, or exemplary language (e.g., "such as") provided herein, is intended merely to better illuminate the disclosure and does not pose a limitation on the scope of the disclosure unless otherwise claimed. Also, numerous modifications and adaptations will be readily apparent to those skilled in this art without departing from the spirit and scope of the disclosure.

[0136] According to an embodiment of the disclosure, a cleaner and a mop brush head that can quickly clean a surface to be cleaned, by spraying high-temperature water on the surface to be cleaned may be provided.

[0137] According to an embodiment of the disclosure, a cleaner and a mop brush head that can quickly clean a surface to be cleaned, by spraying high-temperature water with a small temperature difference may be provided.

[0138] According to an embodiment of the disclosure, a cleaner and a mop brush head, which are supplied with power from a battery and can quickly clean a surface to be cleaned, with water may be provided.

[0139] According to an embodiment of the disclosure, a cleaner may include a mop brush head, and the mop brush head may include a head body, a mop attachable to the mop brush head so as to be disposed below the head body to contact a surface to be cleaned, and being detachable from the mop brush head, a sprayer configured to spray water toward the surface to be cleaned, a water tank in the head body and configured to store water, a hot water tank having an inlet through which water stored in the water tank flows into the hot water tank, an outlet through which water in the hot water tank flows to the sprayer, and a channel structure having a plurality of channels inside the hot water tank so that water in the hot water tank moves along a preset path through the plurality of channels from the inlet to the outlet, and a heater configured to heat the water in the hot water tank.

[0140] According to an embodiment of the disclosure, the hot water tank, the channel structure, and the heater may be configured so that water in the hot water tank is heated by the heater as the water moves along the preset path through the plurality of channels of the channel structure, and a temperature difference in the water sprayed by the sprayer is within 10% of a maximum temperature of the sprayed water.

[0141] According to an embodiment of the disclosure, the plurality of channels may be parallel with each other, and adjacent channels of the plurality of channels may be connected to each other.

[0142] According to an embodiment of the disclosure, a width of each channel of the plurality of channels may be smaller than a width of the hot water tank.

[0143] According to an embodiment of the disclosure, the channel structure may include a channel wall extending in a vertical direction, and a lower end of the channel wall may be spaced apart from the heater.

[0144] According to an embodiment of the disclosure, an upper surface of the channel structure may have a varying height in order to induce gas movement inside the hot water tank.

[0145] According to an embodiment of the disclosure, heights of upper surfaces of the plurality of channels respectively may increase along at least a portion a flow path through which water moves in the hot water tank from the inlet to the outlet.

[0146] According to an embodiment of the disclosure, the mop brush head may further include a lower case supporting the heater, an upper case coupled to the lower case, with the heater and the hot water tank therebetween, and a gasket between the lower case and the upper case to provide a seal between the lower case and the upper case.

[0147] According to an embodiment of the disclosure, the heater may have a flat upper surface.

[0148] According to an embodiment of the disclosure, the mop brush head may further include at least one of a temperature sensor configured to measure a temperature of water in the hot water tank, a water level sensor configured to measure a level of water in the hot water tank, and a power cutoff portion configured to selectively adjust power supplied to the heater according to temperature of the heater.

[0149] According to an embodiment of the disclosure, the cleaner may further include a main body, a battery in the main body, an extension tube configured to connect the main body and the mop brush head to each other, and a wire having at least a portion disposed in the extension tube and configured to transmit power of the battery to the mop brush head to power the heater.

[0150] According to an embodiment of the disclosure, the extension tube may have a length-adjustable structure, and the wire may have an allowable current of 5 A (ampere) or less.

[0151] According to an embodiment of the disclosure, the cleaner may further include a pump configured to provide pressure to move water from the water tank to the sprayer, wherein the cleaner may be configured to operate the pump and the heater at different times.

[0152] According to an embodiment of the disclosure, the mop brush head may further include a filter structure inside the hot water tank and configured to block foreign substances generated during heating of water in the hot water tank from moving to the outlet.

[0153] According to an embodiment of the disclosure, a mop brush head is for use with a cleaner, and the mop brush head may include a head body, a mop attachable to the mop brush head so as to be disposed below the head body to contact a surface to be cleaned, and being detachable from the mop brush head, a sprayer configured to spray water toward the surface to be cleaned, a water tank in the head body and configured to store water, a hot water tank having an inlet through which water stored in the water tank flows into the hot water tank, an outlet through which water in the hot water tank flows to the sprayer, and a channel structure having a plurality of channels inside the hot water tank so that water in the hot water tank moves along a preset path through the plurality of channels from the inlet to the outlet, and a heater configured to heat the water in the hot water tank.

[0154] The cleaner and mop brush head according to the embodiment of the disclosure can quickly clean the surface to be cleaned by spraying high-temperature water on the surface.

[0155] The cleaner and mop brush head according to the embodiment of the disclosure can quickly clean the surface to be cleaned by spraying high-temperature water with a small temperature difference.

[0156] The cleaner and the mop brush head according to the embodiment of the disclosure are supplied with power from a battery and can quickly clean, with water, the surface to be cleaned.

1. A cleaner comprising:
a mop brush head including:
a head body,
a mop attachable to the mop brush head so as to be disposed below the head body to contact a surface to be cleaned, and being detachable from the mop brush head,
a sprayer configured to spray water toward the surface to be cleaned,
a water tank in the head body and configured to store water,
a hot water tank having an inlet through which water stored in the water tank flows into the hot water tank, an outlet through which water in the hot water tank flows to the sprayer, and a channel structure having a plurality of channels inside the hot water tank so that water in the hot water tank moves along a preset path through the plurality of channels from the inlet to the outlet, and
a heater configured to heat the water in the hot water tank.

2. The cleaner of claim **1**, wherein the hot water tank, the channel structure, and the heater are configured so that
water in the hot water tank is heated by the heater as the water moves along the preset path through the plurality of channels of the channel structure, and a temperature difference in the water sprayed by the sprayer is within 10% of a maximum temperature of the sprayed water.

3. The cleaner of claim **1**, wherein
the plurality of channels are parallel with each other, and
adjacent channels of the plurality of channels are connected to each other.

4. The cleaner of claim **3**, wherein a width of each channel of the plurality of channels is smaller than a width of the hot water tank.

5. The cleaner of claim **1**, wherein
the channel structure includes a channel wall extending in a vertical direction, and
a lower end of the channel wall is spaced apart from the heater.

6. The cleaner of claim **1**, wherein an upper surface of the channel structure has a varying height in order to induce gas movement inside the hot water tank.

7. The cleaner of claim **3**, wherein heights of upper surfaces of the plurality of channels respectively increase along at least a portion a flow path through which water moves in the hot water tank from the inlet to the outlet.

8. The cleaner of claim **1**, wherein the mop brush head further includes:
a lower case supporting the heater,
an upper case coupled to the lower case, with the heater and the hot water tank therebetween, and
a gasket between the lower case and the upper case to provide a seal between the lower case and the upper case.

9. The cleaner of claim **1**, wherein the heater has a flat upper surface.

10. The cleaner of claim **1**, wherein the mop brush head further includes at least one of a temperature sensor configured to measure a temperature of water in the hot water tank, a water level sensor configured to measure a level of water in the hot water tank, and a power cutoff portion configured to selectively adjust power supplied to the heater according to temperature of the heater.

11. The cleaner of claim **1**, further comprising:
a main body;
a battery in the main body;
an extension tube configured to connect the main body and the mop brush head to each other; and
a wire having at least a portion disposed in the extension tube and configured to transmit power of the battery to the mop brush head to power the heater.

12. The cleaner of claim **11**, wherein
the extension tube has a length-adjustable structure, and
the wire has an allowable current of 5 A (ampere) or less.

13. The cleaner of claim **1**, further comprising:
a pump configured to provide pressure to move water from the water tank to the sprayer,
wherein the cleaner is configured to operate the pump and the heater at different times.

14. The cleaner of claim **1**, wherein the mop brush head further includes:
a filter structure inside the hot water tank and configured to block foreign substances generated during heating of water in the hot water tank from moving to the outlet.

15. A mop brush head for use with a cleaner, the mop brush head comprising:
a head body;
a mop attachable to the mop brush head so as to be disposed below the head body to contact a surface to be cleaned, and being detachable from the mop brush head;
a sprayer configured to spray water toward the surface to be cleaned;
a water tank in the head body and configured to store water;
a hot water tank having an inlet through which water stored in the water tank flows into the hot water tank, an outlet through which water in the hot water tank flows to the sprayer, and a channel structure having a plurality of channels inside the hot water tank so that water in the hot water tank moves along a preset path through the plurality of channels from the inlet to the outlet; and
a heater configured to heat the water in the hot water tank.

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