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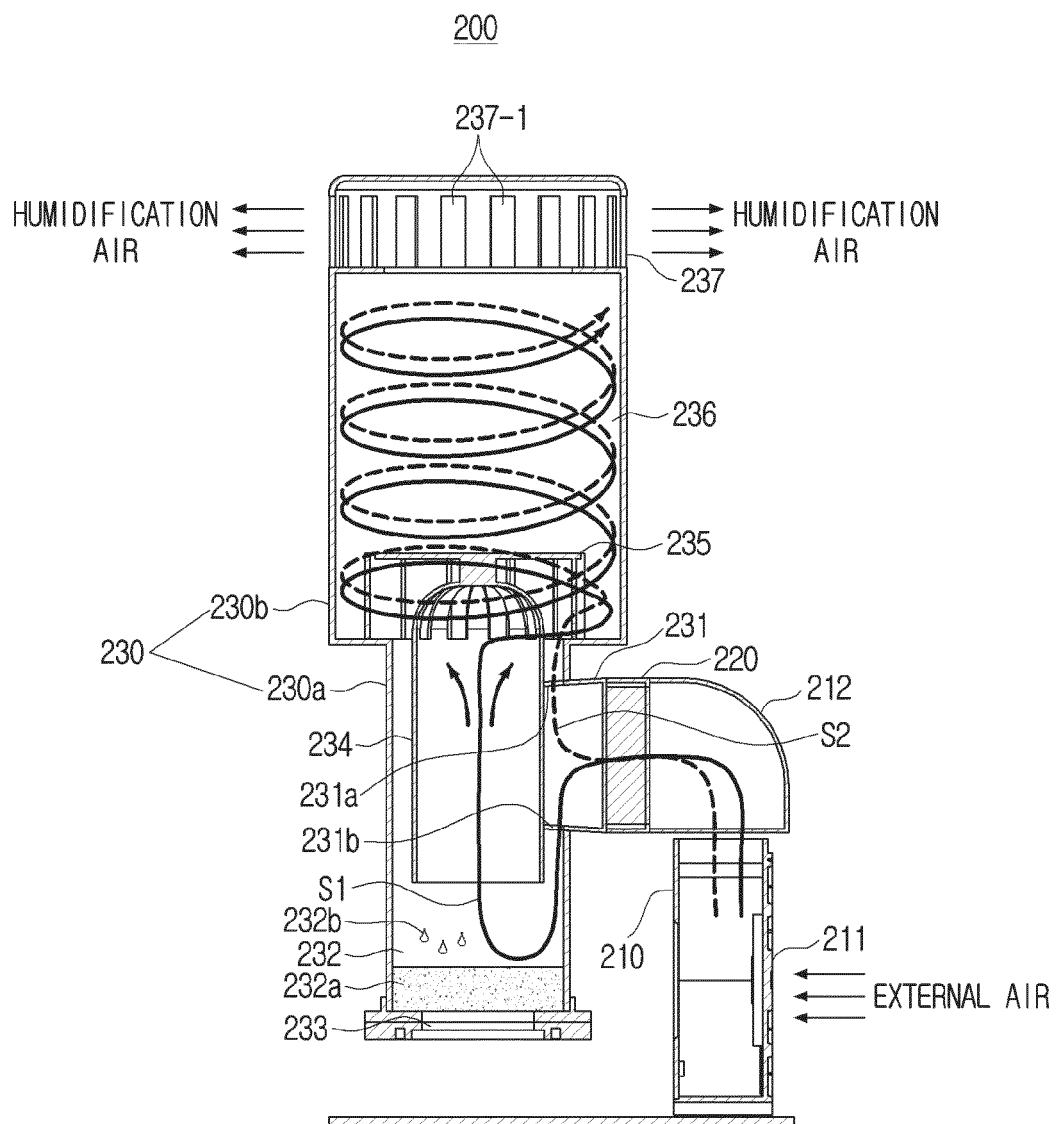
(54) **HUMIDIFICATION MODULE AND HOME APPLIANCE COMPRISING SAME**

(57) A humidification module includes a housing including a lower part to store water and a guide part to guide droplets generated from the stored water to an upper part of the housing, and a fan configured to guide heated air to the housing. The housing includes a first flow path through which a first part of the heated air guided by the fan passes through the lower part of the housing

and is guided with the droplets to the upper part of the housing by the guide part, and a second flow path through which a second part of the heated air guided by the fan that vaporizes the droplets guided with the first part of the heated air passes and is guided to the upper part of the housing by the guide part.

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FIG. 5



Description**[Disclosure]****[Technical Field]****[Technical Solution]**

[0001] The disclosure relates to a humidification module having an enhanced structure and a home appliance including the same. More particularly, the disclosure relates to a humidification module having enhanced humidification performance by heating generated droplets through an ultrasonic vibrator and a home appliance including the same.

[Background Art]

[0002] A humidification device of the related art may be implemented as a heating type which heats water and discharges generated steam, an ultrasonic type which makes water into fine particles through vibration using an ultrasonic vibrator and discharges the particles, a vaporization type which vaporizes water using a filter, and a combination type obtained by combining the heating type and the ultrasonic type.

[0003] In a case of the ultrasonic type humidification device, a peripheral portion of the ultrasonic type humidification device is smoothly humidified, but there is a problem that, due to the characteristics of the type of discharging fine water particles, a humidification degree is significantly reduced, as it is far away from the ultrasonic humidification device. In addition, there is a problem that a white dust phenomenon occurs since the ultrasonic humidification device directly discharges the fine water particles.

[0004] As illustrated in FIG. 1, the combination type may use a method for heating water using a heater (e.g., heating to 50 to 80 degrees Celsius), converting the heated water into fine particle using an ultrasonic vibrator, and discharging the fine water particles using a fan.

[0005] At that time, the combination type humidification device has a problem that, a large energy is consumed because of the heating of water, and a vaporization degree is reduced compared to that of the vaporization type humidification device, because water is not heated to 100 degrees Celsius.

[0006] In addition, the combination type humidification device is substantially similar to the ultrasonic type humidification device, and there is a problem that, although a peripheral portion of the ultrasonic type humidification device is smoothly humidified, a humidification degree is significantly reduced, as it is far away from the humidification device, because the water particles discharged from the combination type humidification device are large and heavy.

[0007] In addition, the combination type humidification device discharges non-vaporized water particles, the white dust phenomenon may occur.

[0008] According to an embodiment of the disclosure, there is provided a humidification module including a housing including a lower part to store water and a guide part to guide droplets generated from the stored water in the lower part of the housing to an upper part of the housing; and a fan configured to guide heated air to the housing. The housing includes a first flow path through which a first part of the heated air guided by the fan passes through the lower part of the housing and is guided with the droplets to the upper part of the housing by the guide part; and a second flow path through which a second part of the heated air guided by the fan that vaporizes the droplets guided with the first part of the heated air passes and is guided to the upper part of the housing by the guide part.

[0009] The housing may further include a branch pipe between the guide part and the fan, and a lower part of the branch pipe may include a first leakage part through which the first part of the heated air flows to the first flow path, and an upper part of the branch pipe may include a second leakage part through which the second part of the heated air flows to the second flow path.

[0010] The first part of the heated air may flow from the branch pipe to the first leakage part, pass the lower part of housing, and be guided to the upper part of the housing with droplets by the guide part, and the second part of the heated air may flow from the branch pipe to the second leakage part and be guided to the upper part of the housing by the guide part.

[0011] An outlet of the branch pipe may be at a location higher than a water level of the water stored in the lower part of the housing.

[0012] The first flow path and the second flow path may have a common section in which the first part of the heated air and the second part of the heated air are mixed with each other.

[0013] The housing may further include a mixing part at a starting point of the common section and in which the first part and the second part are mixed with each other and flow.

[0014] The mixing part may include a guide, and the guide of the mixing part may cause the first part of the heated air and the second part of the heated air to flow in a spiral direction and the droplets to vaporize.

[0015] The housing may further include a discharge part configured to discharge the droplets vaporized by the heated air to outside of the humidification module.

[0016] The humidification module may further include a heater between the branch pipe and the fan, the heater being configured to heat external air sucked through the fan and supply the heated air to the branch pipe.

[0017] According to another embodiment, there is provided a home appliance including a humidification module, the home appliance including a memory to store at

least one instruction; and a processor configured to be communicatively coupled to the memory to control the home appliance, in which the humidification module includes a fan configured to suck external air, a heater configured to be connected to the fan, heat the external air sucked through the fan and supply heated air, and a housing including a lower part to store water and a guide part to guide droplets generated from the stored water in the lower part of the housing to an upper part of the housing, and the housing includes a first flow path through which a first part of the heated air passes through the lower part of the housing and is guided with the droplets to the upper part of the housing by the guide part, a second flow path through which a second part of the heated air that vaporizes the droplets guided with the first part of the heated air passes and is guided to the upper part of the housing, and a mixing part in which the first part of the heated air and the second part of the heated air are mixed with each other and flow.

[0018] The home appliance may further include a first water tank to store water, the humidification module may further include a second water tank to store water introduced from the first water tank, the housing may further include an opening to connect the first water tank and the second water tank, and the first water tank and the second water tank may be connected through a water supply pipe.

[0019] The home appliance may further include a water level detection sensor configured to detect a water level of the second water tank, and the processor may be configured to adjust an amount of the first part of the heated air moving through the first flow path by adjusting an amount of water introduced from the first water tank into the second water tank based on the water level of the second water tank detected through the water level detection sensor.

[0020] The home appliance may further include a user interface, and the processor may be configured to, based on a user input to adjust a humidification amount of the home appliance being obtained through the user interface, adjust an amount of the first part of the heated air moving through the first flow path by adjusting an amount of water introduced from the first water tank to the second water tank based on the user input.

[0021] The home appliance may further include a user interface, and the processor may be configured to obtain a user input to adjust a humidification amount of the home appliance through the user interface, and adjust an amount of the external air sucked through the fan based on the user input.

[0022] The home appliance may include a user interface, and a humidity sensor to detect an external humidity of the home appliance, and the processor is configured to adjust an amount of the first part of the heated air moving through the first flow path by adjusting an amount of water introduced from the first water tank to the second water tank by comparing a humidity setting value input through the user interface and the external humidity de-

tected through the humidity sensor.

[Description of Drawings]

[0023] The above and other aspects, features, and advantages of certain embodiments of the present disclosure will be more apparent from the following description taken in conjunction with the accompanying drawings, in which:

FIG. 1 is a diagram conceptually illustrating a humidification method of the related art.

FIG. 2 is a diagram conceptually illustrating a humidification method according to an embodiment of the present disclosure.

FIG. 3 is a block diagram illustrating a configuration of a home appliance according to an embodiment of the present disclosure.

FIGS. 4A and 4B are perspective views illustrating a humidification module according to an embodiment of the present disclosure.

FIG. 5 is a cross-sectional view illustrating a cross section of the humidification module according to an embodiment of the present disclosure.

FIG. 6A is a perspective view illustrating a guide part of the home appliance according to an embodiment of the present disclosure.

FIG. 6B is a plan view illustrating a connection pipe of the humidification module according to an embodiment of the present disclosure.

FIG. 7A is a perspective view illustrating a mixing part of the humidification module according to an embodiment of the present disclosure.

FIG. 7B is a bottom view illustrating the mixing part of the humidification module according to an embodiment of the present disclosure.

FIGS. 8 and 9 are diagrams illustrating a method for adjusting a humidification amount of the home appliance according to an embodiment of the present disclosure.

[Best Mode]

[0024] Hereinafter, various embodiments of the disclosure will be described with reference to the accompanying drawings. However, it should be understood that this is not to limit the scope of the specific embodiments and all modifications, equivalents, and/or alternatives included in the disclosed spirit and technical scope are included. In relation to explanation of the drawings, similar reference numerals may be used for similar elements. In addition, the accompanying drawings may not be illustrated with actual scales but may be illustrated with enlarged dimensions of some elements, for the understanding of the disclosure.

[0025] The expressions "first," "second" and the like used in the disclosure may denote various elements, regardless of order and/or importance, and may be used

to distinguish one element from another, and does not limit the elements. For example, a first user device and a second user device may represent user devices different from each other, regardless of order and/or importance.

[0026] For example, a first element may be referred to as a second element and the second element may also be similarly referred to as the first element, while not departing from the scope of a right of the disclosure. The terms used in the description are used to describe an embodiment, but may not intend to limit the scope of other embodiments. In the disclosure, unless otherwise defined specifically, a singular expression may encompass a plural expression. The terms used herein including technical or scientific terms may refer to the same terms generally understood by those skilled in the art in the technical field of the disclosure. The terms defined in normal dictionaries among the terms used in the disclosure may be interpreted as the same or similar meanings in the related technologies and are not interpreted as ideal or excessively formal meanings. In some cases, the terms defined in the disclosure may not be interpreted to exclude the embodiments of the disclosure.

[0027] In order to solve the above problems in the related art and other problems, the disclosure provides a humidification module having an enhanced structure to prevent a white dust phenomenon by humidifying a portion far away from a home appliance, and a home appliance including the same.

[0028] Through the embodiments of the present disclosure, a modification module which, by using a humidification module having an enhanced structure and a home appliance including the same, solves problems of home appliances of the related art by increasing a vaporization rate by bringing the heated air into contact with water particles micronized through an ultrasonic vibrator and discharging the vaporized humidification air, and a home appliance including the same are provided.

[0029] In addition, through implementation of the simplified structure of the home appliance using one fan, a humidification module makes the cleaning of the home appliance easy and reduces the manufacturing cost of the home appliance, and a home appliance including the same are provided.

[0030] Hereinafter, a humidification module according to an embodiment of the disclosure will be described in detail with reference to the accompanying drawings.

[0031] As described above, the combination type home appliance of the related art illustrated in FIG. 1 has a problem that a large energy is consumed since the home appliance heats water, and the home appliance discharges non-vaporized droplets, because the water is not heated to 100 degrees Celsius, and the discharged droplets are large and heavy and the home appliance of the related art has a short humidification distance, which causes a white dust phenomenon.

[0032] In order to solve the above problems, instead of the method for heating the water directly, a new hu-

midification method for heating droplets generated by an ultrasonic vibrator to increase a vaporization rate is provided.

[0033] In addition, a structure that is easy for cleaning is important to maintenance of the humidification module due to its characteristics. Accordingly, as the structure of the humidification module is simplified, the cleaning may be easily performed, and the production cost for producing the humidification module may be reduced.

[0034] Therefore, in order to simplify the structure of the humidification module, the new humidification method described above may be implemented using one fan, and the method will be described in detail with reference to the accompanying drawings hereinafter.

[0035] FIG. 2 is a diagram conceptually illustrating a humidification method according to an embodiment.

[0036] A fan may suck external air of a humidification module into the inside of the humidification module.

[0037] In addition, the air introduced into the humidification module may be heated through a heater.

[0038] Some of the air heated through the heater may form an ascending air current (first air current) for raising droplets generated by a ultrasonic vibrator, and some of the other air heated through the heater may form an air current (second air current) for supplying dry high-temperature air for heating or vaporizing droplets 232b (for example, FIG. 5).

[0039] After that, the first air current and the second air current are mixed thereby heating droplets contained in the first air current and vaporizing a larger amount of droplets.

[0040] In addition, according to the vaporization of the droplets, the humidified air (humidification air) may be discharged through a discharge part.

[0041] In other words, the new humidification method described above may be implemented using one fan by forming the first air current and the second air current having different movement path using the air heated through the heater and mixing the first air current and the second air current.

[0042] FIG. 3 is a block diagram illustrating a configuration of a home appliance 100 including a humidification module according to an embodiment. The home appliance 100 may include a memory 110, a communication interface 120, a user interface 130, a display 140, a first water tank 150, a sensor 160, a processor 170, and a humidification module 200. In this case, the humidification module 200 may include a suction part 210 including a fan 211, a heater 220, and a housing 230. In addition, the housing 230 may include a branch pipe 231, a second water tank 232, an ultrasonic vibrator 233, a guide part 234, a mixing part 235, a vaporization part 236, and a discharge part 237.

[0043] Some constituent elements of the home appliance 100 and the humidification module 200 may be omitted and other constituent elements may be further included. In addition, some constituent elements of the home appliance 100 may be included in the humidification mod-

ule 200, and in the same manner, some constituent elements of the humidification module 200 may be included in the home appliance 100.

[0044] Further, the home appliance 100 including the humidification module 200 may be implemented as a humidifier, but this is merely an embodiment, and the home appliance may be implemented as various electronic apparatus having a humidification function such as an air purifier, an air conditioner, a fan, and the like.

[0045] The memory 110 may store at least one instruction regarding the home appliance 100 or the humidification module 200. The memory 110 may store an operating system (O/S) for driving the home appliance 100 or the humidification module 200. In addition, the memory 110 may store various software programs or applications for operating the home appliance 100 or the humidification module 200 according to various embodiments of the disclosure. In addition, the memory 110 may include a semiconductor memory such as a flash memory or the like and a magnetic storage medium such as a hard disk drive or the like.

[0046] Specifically, the memory 110 may store various software modules for operating the home appliance 100 or the humidification module 200 according to various embodiments of the disclosure, and the processor 170 may control an operation of the home appliance 100 by executing various software modules stored in the memory 110.

[0047] In other words, the memory 110 may be accessed by the processor 170 and reading, recording, editing, deleting, or updating of the data by the processor 170 may be executed.

[0048] Meanwhile, a term, the memory 110 in the disclosure, may include the memory 110, a ROM (not illustrated) and a RAM (not illustrated) in the processor 170, or a memory card (not illustrated) (e.g., micro SD card or memory stick) mounted on the home appliance 100.

[0049] The communication interface 120 may include circuitry and may communicate with an external device and a server. The communication interface 120 may transmit and receive data by communicating with the external device or the server based on the wired or wireless communication method. In this case, the external device may refer to a user terminal device (not illustrated), herein, the user terminal device may be implemented as various electronic devices capable of performing communication with the humidification module 200 such as a smartphone, a tablet, a wearable device, a TV, a home appliance, or a personal computer. In addition, the communication interface 120 may transmit and receive data or control commands by communicating with the user terminal device. In this case, the control command may be a control command for adjusting the humidification amount of the home appliance 100 or the humidification module 200.

[0050] In addition, the communication interface 120 may include a Wi-Fi module (not illustrated), a Bluetooth module (not illustrated), an infrared (IR) module, a local

area network (LAN) module, an Ethernet module, or the like. Herein, each communication module may be implemented in a form of at least one hardware chip. In addition to the communication method described above, the wireless communication module may include at least one communication chip for performing the communication according to various wireless communication standards such as zigbee, Universal Serial Bus (USB), Mobile Industry Processor Interface Camera Serial Interface (MIPI CSI), 3rd Generation (3G), 3rd Generation Partnership Project (3GPP), Long Term Evolution (LTE), LTE Advanced (LTE-A), 4th Generation (4G), 5th Generation (5G), and the like. However, this is merely an embodiment, and the communication interface 120 may use at least one communication module among various communication modules.

[0051] The user interface 130 is a constituent element for receiving an input of a user command for controlling the home appliance 100 or the humidification module 200. The user interface may be implemented as a device such as a button, a touch pad, a mouse, and a keyboard, and may also be implemented as a touch screen capable of performing the display function and the manipulation input function. Herein, the button may be various types of buttons such as a mechanical button, a touch pad, or a wheel formed in any region of a front portion, a side portion, or a rear portion of the appearance of the main body of the home appliance 100. The home appliance 100 may obtain various user inputs through the user interface 130. In this case, the user input may be an input for adjusting the humidification amount or the humidification degree of the home appliance 100 or the humidification module 200.

[0052] The display 140 may be implemented as a display including a spontaneous light emitting element or a display including a non-spontaneous light emitting element and a backlight. For example, the display may be implemented as various types of display such as liquid crystal display (LCD), an organic light emitting diodes (OLED) display, light emitting diodes (LED), micro LED, mini LED, plasma display panel (PDP), quantum dot (QD) display, quantum dot light-emitting diodes (QLED), and the like. The display 140 may also include a driving circuit or a backlight unit which may be implemented in a form of a-si TFT, a low temperature poly silicon (LTPS) TFT, or an organic TFT (OTFT).

[0053] The display 140 may display various state information of the home appliance 100 or the humidification module 200. In addition, the display 140 may display sensing information obtained through the sensor 160.

[0054] Further, the display 140 may be implemented as a touch display capable of receiving a user input, and accordingly, a user may input a control command through the display 140 using fingers or an electronic pen.

[0055] The first water tank 150 may store water to be supplied to the second water tank 232 to humidify the external air. The water stored in the first water tank 150 may be supplied to the second water tank 232 provided

in the humidification module 200 through a valve or a pump. In this case, the water supplied to the second water tank 232 may become droplets which are fine water particles by the ultrasonic vibrator 233.

[0056] The sensor 160 may include a sensor (e.g., temperature sensor, humidity sensor) for sensing state information (e.g., water level of the water tank) or environment information (e.g., temperature or relative humidity) of the inside and outside of the home appliance 100 or the humidification device 200.

[0057] Specifically, the sensor 160 may include a humidity sensor 161 for measuring relative humidity of the outside of the home appliance 100 or the humidity device 200.

[0058] In addition, the sensor 160 may include a water level sensor 162 for measuring the water level of water stored in the first water tank 150 or the second water tank 232. In this case, the water level sensor 162 may be located inside the second water tank 232 and detect a water level of the second water tank 232, but this is merely an embodiment, the water level sensor may be located in the first water tank 150 and detect the water level of the first water tank 150.

[0059] The processor 170 may control general operations and functions of the home appliance 100 or the humidification module 200. Specifically, the processor 170 may be connected to constituent elements of the home appliance 100 including the memory 110 or the humidification module 200 and may generally control the operation of the home appliance 100 or the humidification module 200 by executing at least one instruction or module stored in the memory 110 described above.

[0060] The processor 170 may be implemented by various methods. For example, the processor 170 may be implemented as at least one of an application specific integrated circuits (ASICs), an embedded processor, a microprocessor, a hardware control logic, a hardware finite state machine (FSM), and a digital signal processor (DSP). Meanwhile, a term, the processor 170 may be used as the meaning including a central processing unit (CPU), a graphic processing unit (GPU), a main processing unit (MPU), and the like.

[0061] In addition, the configuration of the humidification module 200 will be described in detail with reference to FIGS. 4A, 4B, and 5, hereinafter.

[0062] FIG. 4A is a perspective view illustrating the humidification module 200 according to an embodiment, and FIG. 4B is a perspective view illustrating the humidification module 200 according to an embodiment.

[0063] In addition, FIG. 5 is a cross-sectional view illustrating the humidification module 200 taken along A-A' line according to an embodiment.

[0064] The fan 211 included in the suction part 210 may suck the external air of the humidification module 200 (or external air of the home appliance 100) into the humidification module 200. In addition, the fan 211 may form a flow of the air (air current) so that the air sucked into the humidification module 200 or the heated air that

is heated inside of the humidification module 200 passes through the branch pipe 231 through at least one flow path and moves to the discharge part 237, and the air humidified in the internal portion of the humidification module 200 may be discharged through the discharge part 237.

[0065] The heater 220 may be connected to the suction part 210. Specifically, the heater 220 and the suction part 210 may be connected to each other through a connection pipe 212, and in this case, the connection pipe 212 may include at least one opening, and at least one opening included in the connection pipe 212 may be connected to openings included in the suction part 210 and the heater 220. In addition, the external air sucked through the fan 211 may move to the heater 220 through the suction part 210 and the connection pipe 212.

[0066] In addition, the heater 220 may heat the external air sucked through the fan 211 and supply the heated air. Further, the heater 220 may be located between the fan 211 and the branch pipe 231. Also, the heated air heated through the fan 211 may be introduced into the housing 230 (or to the branch pipe 231) by the fan 211.

[0067] In this case, the heater 220 may have an opening formed so that the air introduced through the connection pipe 212 is introduced to the housing 230, and may heat the air passing through the opening included in the heater 220 to be introduced to the housing 230.

[0068] In addition, the housing 230 may include the guide part 234 and store water on a lower part thereof. In this case, the housing 230 may include the branch pipe 231 on one side of the guide part 234. In other words, the housing 230 may form the branch pipe 231 on the one side, and include the second water tank 232 for storing the water introduced from the outside in a lower part 230a of the housing 230. In this case, the housing 230 may include a first flow path S1 and a second flow path S2 which are flow paths through which the external air introduced through the fan 211 or the heated air heated through the heater 220 pass.

[0069] Specifically, the housing 230 may include a first flow path S1 formed so that a first part of the heated air passes through a lower part of the housing 230 (or lower part of the branch pipe 231) and is guided to an upper part 230b of the housing 230 by the guide part 234 while containing the droplets 232b generated on the lower part 230a of the housing 230, and a second flow path S2 formed so that a second part of the heated air for vaporizing the droplets contained in the first part of the heated air passes through the upper part of the housing 230 (or upper part of the branch pipe 231) and is guided to the upper part 230b of the housing 230 by the guide part 234. In this case, the first flow path S1 and the second flow path S2 may have a common section in which the first part and the second part of the heated air are mixed (or flow).

[0070] In other words, the first part of the air heated through the heater 220 may move through the first flow path S1 and become the first air current that raises the

droplets 232b generated by the ultrasonic vibrator 233 in the second water tank 232 to the upper part.

[0071] In this case, the first flow path S1 may be configured with the suction part 210 - the connection pipe 212 - the heater 220 - the branch pipe 231 - a first leakage part 231a - the second water tank 232 - the guide part 234 - mixing part 235 - the vaporization part 236 - the discharge part 237. In this case, some of constituent elements configuring the first flow path S1 may be omitted, other constituent elements may be further included, or the order of some constituent elements may be changed.

[0072] In addition, the second part of the air heated through the heater 220 may move through the second flow path S2 and become the second air current that is mixed with the first air current comprising the raised droplets 232b through the first flow path S1.

[0073] In this case, the second flow path S2 may be configured in the order of the suction part 210 - the connection pipe 212 - the heater 220 - the branch pipe 231 - a second leakage part 231b - the mixing part 235 - the vaporization part 236 - the discharge part 237. In this case, some of constituent elements configuring the second flow path S2 may be omitted, other constituent elements may be further included, or the order of some constituent elements may be changed.

[0074] In addition, the branch pipe 231 may be located between the guide part 234 and the suction part 210, the fan 211, the connection pipe 212, or the heater 220. Specifically, the air heated through the heater 220 may be introduced to the branch pipe 231. In this case, the upper part of the branch pipe 231 may include the first leakage part 231a through which the first part of the heated air leaks to the first flow path S1, and the second leakage part 231b through which the second part of the heated air leaks to the second flow path S2.

[0075] In other words, the branch pipe 231 may include first leakage part 231a which guides the heated air to the first flow path S1 so that the first part of the heated external air (heated air) moves along the first flow path S1, and the second leakage part 231b which guides the heated air to the second flow path S2 so that the second part of the heated external air (heated air) moves along the second flow path S2.

[0076] In this case, the first leakage part 231a may be located on the upper part of the branch pipe 231 and the second leakage part 231b may be located on the lower part of the branch pipe 231. Accordingly, the first part of the heated air may leak from the branch pipe 231 to the first leakage part 231a, pass the lower part of housing 230, and be guided to the upper part of the housing 230 while containing the droplets generated in the second water tank 232 by the guide part 234, and the second part of the heated air may leak from the branch pipe 231 to the second leakage part 231b and be guided to the upper part of the housing 230 by the guide part 234.

[0077] In addition, the first leakage part 231a and the second leakage part 231b may be implemented as openings, but there is no limitation thereto, and the amount of

air or air current passing through the first leakage part 231a and the second leakage part 231b may be adjusted through a valve controlled through the processor 170.

[0078] In other words, the branch pipe 231 may further include a first valve for adjusting the amount of the heated air which leaks to the first flow path S1 or a second valve for adjusting the amount of the heated air which leaks to the second flow path S2, and in this case, the processor 170 may adjust the amount of the heated air which leaks to the first flow path S1 or the second flow path S2 by controlling the first valve or the second valve.

[0079] Meanwhile, an outlet of the branch pipe 231 may be disposed at a location higher than a water level of the water stored in the lower part 230a of the housing 230 or the lower part of the guide part 234. Specifically, the first leakage part 231a or the second leakage part 231b of the branch pipe 231 may be disposed on a location higher than a maximum water level of the water stored in the second water tank 232 or the lower part of the guide part 234.

[0080] In addition, the first part of the heated air which passed through the first leakage part 231a may move along the first flow path S1 and become the ascending air current (first air current) for raising the droplets 232b generated by the ultrasonic vibrator 233 in the second water tank 232.

[0081] Further, the second part of the heated air which passed through the second leakage part 231b may move along the second flow path S2 and become the second air current that is mixed with the first air current and heats or vaporizes the droplets 232b (or first air current) contained in the first air current.

[0082] Specifically, the first air current which is the air passed through the first leakage part 231a may fall down along an outer part of a wall of the guide part 234 to move to the second water tank 232. In addition, the first air current may raise the droplets 232b generated by the ultrasonic vibrator 233 using water 232a stored in the second water tank 232 along an inner part of the wall.

[0083] The second water tank 232 may be a water tank storing the water 232a for the ultrasonic vibrator 233 to generate the droplets 232b. In this case, the first water tank 150 and the second water tank 232 may be connected through a separate connection part (not illustrated), and in the connection part for connecting the first water tank 150 and the second water tank 232 to each other, a pump (not illustrated), a water supply pipe (not illustrated), or a valve (not illustrated) for exchanging the water between the first water tank 150 and the second water tank 232 may be provided. Specifically, on one side of the housing 230 (or second water tank 232), an opening for connecting the first water tank 150 and the second water tank 232 for receiving water from the first water tank 150 may be formed. In addition, the first water tank 150 and the second water tank 232 may be connected to each other through the water supply pipe, the valve, or the pump through the opening.

[0084] The guide part 234 may guide the first part of

the heated air introduced to the branch pipe 231 to the first flow path S1 and guide the second part of the heated air to the second flow path S2. In other words, the heated air introduced to the branch pipe 231 may collide with one side of the guide part 234 and may be guided to the first flow path S1 and the second flow path S2 through the first leakage part 231a and the second leakage part 231b. In other words, the first part of the heated air may leak from the branch pipe 231 to the first leakage part 231a by the guide part 234, and the second part of the heated air may leak from the branch pipe 231 to the second leakage part 231b by the guide part 234.

[0085] In addition, the guide part 234 may refer to a pipe for connecting the second water tank 232 and the mixing part 235 (or vaporization part 236), a pipe for guiding the droplets 232b generated in the second water tank 232 to the upper part 230b of the housing 230, the mixing part 235, or the vaporization part 236, or a pipe for the first air current to guide the droplets 232b to the upper part 230b of the housing 230. In other words, the guide part 234 may guide the second air current containing the droplets 232b generated in the second water tank 232 to the upper part 230b of the housing 230, and the first air current and the second air current may be separated through the wall of the guide part 234. In this case, the ceiling of the upper part of the guide part 234 may be blocked by the cover.

[0086] Specifically, as illustrated in FIGS. 6A and 6B, the first air current containing the droplets 232b may raise along an inner portion of a wall 234-1 of the guide part 234 and reach the upper part of the guide part 234. In this case, the ceiling of the upper part of the guide part 234 may be blocked or covered by a cover 234-3, and a part of the side wall may be opened. Accordingly, the upper part of the guide part 234 may prevent the non-vaporized droplets 232b or the first air current from being directly discharged to the discharge part 237 and introduce the first air current that passed through the guide part 234 to the mixing part 235.

[0087] In this case, the first air current may be introduced to the mixing part 235 through at least one opening 234-2 formed on an upper side surface of the guide part 234. In this case, on the upper part of the guide part 234, a plurality of guides or walls may be arranged in a spiral or radial manner, and the first air current passed through the guide part 234 may be introduced to the mixing part 235 through the at least one opening 234-2 formed on the plurality of walls.

[0088] Meanwhile, the second air current may pass through the second leakage part 231b and raise along an external wall of the guide part 234 to be introduced to the mixing part 235.

[0089] In other words, the first flow path S1 and the second flow path S2 may have a common section in which the first part of the heated air (first air current) and the second part of the heated air (second air current) are mixed with each other. In this case, the common section may refer to a section in which the first air current passes

through the guide part 234 from the first flow path S1 and passes through the mixing part 235 or the vaporization part 236, and a section in which the second air current passes through the second leakage part 231b from the second flow path S2 and passes through the mixing part 235 or the vaporization part 236. In other words, the common section of the first flow path S1 and the second flow path S2 may be a section where the mixing part 235, the vaporization part 236, or the discharge part 237 commonly included in the first flow path S1 and the second flow path S2 are located. In this case, the mixing part 235 may be disposed at a starting point of the common section, and the first air current and the second air current may turn around (or rotate) in a spiral direction in the mixing part 235, and in this case, the droplets contained in the first air current may be heated or vaporized.

[0090] Specifically, the mixing part 235 may refer to a flow path guide member, an air current mixer, or an air mixer containing a guide for flowing, mixing, rotating, or turning at least one air current. Accordingly, the first part of the heated air and the second part of the heated air introduced to the mixing part 235 may not be discharged directly to the discharge part 237, and may be remained and mixed in the mixing part 235 or the vaporization part 236, and in this case, the second part of the heated air may heat or vaporize the droplets contained in the first part of the heated air. In addition, the mixing part 235 may have a structure in which a plurality of guides 235-1 to 235-9 are arranged on the side surface in the spiral shape, and the air or the air current introduced to the mixing part 235 may move (or flow or be mixed) along the guides 235-1 to 235-9. Accordingly, the first air current and the second air current may flow, move, be mixed, turn around, or rotate by the guides 235-1 to 235-9 of the mixing part 235, and in this case, the first air current and the second air current may be mixed and raise to the discharge part 237 while rotating in the spiral direction in the vaporization part 236. Meanwhile, it is described that the first air current and the second air current raise to the discharge part 237 while rotating in the spiral direction by the mixing part 235, but the configuration is not limited thereto, and the first air current and the second air current may move around the mixing part 235 and vaporization part 236 and mixed with each other in various manner by various methods, and accordingly, the second air current may heat or vaporize the droplets contained in the first air current.

[0091] Specifically, as illustrated in FIGS. 7A and 7B, the mixing part 235 may include the plurality of guides 235-1 to 235-9 and, in this case, the plurality of guides 235-1 to 235-9 may be arranged in the spiral manner. In addition, the mixing part 235 may impart a turning force to the first air current introduced to the mixing part 235 through the guide part 234 and the second air current introduced to the mixing part 235 through the second leakage part 231b, and accordingly, the first air current and the second air current may raise while rotating in the spiral manner. In other words, the first air current and the

second air current having the turning force imparted by the mixing part 235 may be mixed while rotating in the mixing part 235 and the vaporization part 236 in the spiral manner.

[0092] In other words, the mixing part 235 may mix the first air current and the second air current to form a rotating air current (third air current). In this case, the third air current may be an air current in which the first air current and the second air current are mixed, may rotate in the spiral manner and raise along the inner portion of the wall of the vaporization part 236. In this case, the droplets 232b contained in the first humid air current may be mixed with the second air current at a high temperature and low humidity. Accordingly, the droplets 232b contained in the first air current may be heated and vaporized.

[0093] Meanwhile, the first air current, the second air current, and the third air current may rotate in the spiral manner in the mixing part 235 and the vaporization part 236, but there is no limitation thereto, and the air currents may rotate in various forms such as in a circular form, an elliptical form, or a cyclone form.

[0094] In addition, the structure of the mixing part 235 may be implemented with the plurality of guides 235-1 to 235-9 arranged in the spiral manner, and there is no limitation thereto, and the structure of the mixing part 235 may be implemented with various structures for rotating the introduced air or air current. For example, the mixing part 235 may include the plurality of guides and walls, and in this case, the plurality of guides or walls may be arranged or connected radially based on a central axis of the mixing part 235.

[0095] Meanwhile, in the same manner as the mixing part 235, the upper part of the guide part 234 may also include a plurality of guides and walls, and in this case, the plurality of guides or walls may be arranged in the spiral manner or may be arranged or connected radially based on a central axis of the guide part 234.

[0096] In addition, for the mixing part 235, in order to prevent the first air current and the second air current from directly raising to be discharged to the discharge part 237, the ceiling or the upper part of the mixing part 235 may be blocked or covered with a cover 235a. When the first air current and the second air current raise and are discharged to the discharge part 237 without being sufficiently mixed, there is a problem that the droplets 232b contained in the first air current may not be sufficiently vaporized. In order to prevent such a problem, the mixing part 235 may rotate the first air current and the second air current in the spiral direction so that the first air current and the second air current do not directly raise to the discharge part 237, and the first air current and the second air current may raise while rotating along the inner portion of the vaporization part 236. Accordingly, the time for mixing the first air current and the second air current and the time for heating and vaporizing the droplets 232b contained in the first air current may increase, thereby exhibiting an effect of increasing a vaporization rate of

the droplets 232b.

[0097] In addition, the third air current mixed in the mixing part 235 may be introduced to the vaporization part 236. In this case, the vaporization part 236 may vaporize the droplets 232b contained in the first air current by the first air current and the second air current mixed by the mixing part 235. Specifically, the third air current in which the first air current and the second air current are mixed may raise while rotating in the spiral manner along the inner portion of the wall of the vaporization part 236, and the droplets 232b may be heated and vaporized while the third air current rises. In addition, the humidification air from which the droplets 232b are vaporized may reach the discharge part 237.

[0098] Meanwhile, it is described that the first air current and the second air current are mixed in the mixing part 235 and the droplets contained in the first air current are vaporized in the vaporization part 236, but there is no limitation thereto, and the droplets contained in the first air current may be vaporized in the mixing part 235, and the first air current and the second air current may be mixed in the vaporization part 236.

[0099] In addition, the third air current may be discharged to the outside of the humidification module 200 through a plurality of openings 237-1 formed in the discharge part 237. In this case, as the droplets 232b contained in the first air current are mixed with the second air current and vaporized, the third air current discharged through the discharge part 237 may be humidification air from which the droplets 232b are vaporized. Accordingly, the humidification air discharged through the discharge part 237 may humidify a large space while moving to a portion far from the humidification module 200. In addition, as the humidification air from which the droplets 232b are vaporized is discharged, and accordingly, the white dust phenomenon does not occur.

[0100] FIG. 8 is a diagram illustrating a method for adjusting a humidification amount of the home appliance 100 according to an embodiment.

[0101] The processor 170 may adjust the water level of the water 232a stored in the second water tank 232 and adjust the humidification amount of the humidification module 200 by comparing a relative humidity around the home appliance 100 obtained through the humidity sensor 161 and a set humidity value.

[0102] Specifically, the processor 170 may sense the humidity of the outside of the home appliance 100 through the humidity sensor 161 (S810).

[0103] The processor 170 may identify whether the relative humidity and the set humidity value of the home appliance 100 are different (S820). In this case, the set humidity value may be a value received through the communication interface 120 from the user terminal device or a value input through the user interface 130.

[0104] When the sensed relative humidity is different from the set humidity value (S820-Y), the home appliance 100 may adjust the water level of the water 232a stored in the second water tank 232 (S830).

[0105] In this case, the humidification amount may vary depending on the water level of the water 232a stored in the second water tank 232. As illustrated in FIG. 9, if the water level of the water 232a stored in the second water tank 232 is the same as or higher than the lower part of the guide part 234 and there is no space between the second water tank 232 and the guide part 234, the first air current fall down along the wall of the outer portion of the guide part 234 and may not be introduced to the inside of the guide part 234 through the lower portion of the guide part 234. Accordingly, the ascending air current for raising the droplets 232b generated in the second water tank 232 may not be generated. In this case, the humidification amount of the humidification module 200 may be small or none.

[0106] In addition, as illustrated in FIG. 5, when the water level of the water 232a stored in the second water tank 232 is lower the guide portion 234, the first air current may be introduced to the inner portion of the guide part 234 through the lower portion of the guide part 234, and the ascending air current for raising the droplets 232b generated in the second water tank 232 may be formed. Further, as the more ascending air current is formed, the humidification amount of the humidification module 200 may increase.

[0107] In other words, the processor 170 may adjust the humidification amount of the humidification module 200 by adjusting the water level of the water 232a stored in the second water tank 232. In other words, the processor 170 may adjust the amount of the first part of the heated air moving through the first flow path S1 by adjusting the amount of water introduced from the first water tank 150 to the second water tank 232. Accordingly, when the sensed relative humidity is less than the set humidity value, the processor 170 may increase the humidification amount of the humidification module 200 by decreasing the water level of the water 232a stored in the second water tank 232.

[0108] In this case, the processor 170 may identify a target water level of the water 232a stored in the second water tank 232 differently depending on the degree for increasing the humidification amount, and decrease the target water level of the water 232a stored in the second water tank 232 to an appropriate level in order to increase the humidification amount. In this case, the water level at the appropriate level may be stored in the memory 110 in advance.

[0109] In addition, when the target water level of the water 232a stored in the second water tank 232 is identified, the processor 170 may control the water level of the water 232a stored in the second water tank 232 by comparing the water level of the water 232a stored in the second water tank 232 identified through the water level detection sensor 162 with the target water level.

[0110] Specifically, the humidification module 200 may be connected or mounted to the home appliance 100, and in this case, the second water tank 232 included in the humidification module 200 may be connected to the

first water tank 150 included in the home appliance 100 to receive the water from the first water tank 150. In this case, the first water tank 150 and the second water tank 232 may be connected to each other through a water supply pipe, a valve, or a pump. In addition, the water stored in the first water tank 150 may be introduced to the second water tank 232 through the water supply pipe, the valve, or the pump.

[0111] Meanwhile, the humidification module 200 may receive the water from the first water tank 150 included in the home appliance 100, but there is no limitation thereto, and may also receive water directly through the second water tank 232 through a water supply pipe, a water supply pump, a water supply hose, or the like from a separate external water supply device.

[0112] In addition, the processor 170 may control the water supply pipe, the valve, or the pump connecting the first water tank 150 and the second water tank 232, to introduce the water stored in the first water tank 150 to the second water tank 232 and discharge the water 232a stored in the second water tank 232 to the first water tank 150.

[0113] In addition, when the sensed relative humidity matches with the set humidity value (S820-N), the home appliance 100 may maintain the water level of the water 232a stored in the second water tank 232 (S840).

[0114] Meanwhile, the processor 170 may adjust the water level of the second water tank 232 by comparing the sensing value sensed through the humidity sensor 161 with the set humidity value, but there is no limitation thereto. The processor 170 may receive a control command for adjusting a set humidity, a humidification amount, or a humidification degree through the communication interface 120 or the user interface 130, and adjust the water level of the water 232a stored in the second water tank 232 to control the humidification amount of the humidification module 200 according to the received control command.

[0115] In addition, as described above, the processor 170 may adjust the humidification amount of the home appliance 100 or the humidification module 200 by adjusting the water level of the second water tank 232, but there is no limitation thereto. The processor 170 may adjust a suction amount of the fan 211 based on a user input obtained through the user interface 130 or a sensing value sensed through the humidity sensor 161. In other words, the processor 170 may decrease the humidification amount by decreasing the suction amount of the fan 211, and increase the humidification amount by increasing the suction amount of the fan 211.

[0116] In addition, the processor 170 may adjust the amount of the first air current or the second air current by adjusting a valve included in the first leakage part 231a or the second leakage part 231b. In other words, the processor 170 may decrease the humidification amount by decreasing the amount of the first air current or the second air current, and increase the humidification amount by increasing the amount of the first air current or the

second air current.

[0117] In addition, the processor 170 may adjust the amount of the droplets 232b generated through the ultrasonic vibrator 250 by controlling the ultrasonic vibrator 250. In other words, the processor 170 may decrease the humidification amount by decreasing the amount of the droplets 232b generation by decreasing a vibration rate of the ultrasonic vibrator 250, and increase the humidification amount by increasing the amount of droplets 232b generated by increasing the vibration ate of the ultrasonic vibrator 250.

[0118] In addition, the processor 170 may adjust the humidification amount by controlling the heater 220. In other words, the processor 170 may increase the humidification amount by increasing the heating degree of the air by controlling the heater 220, and may decrease the humidification amount by increasing the heating degree of the air by controlling the heater 220.

[0119] In addition, the processor 170 may detect the water level of the first water tank 150 through the water level sensor 162 and adjust the humidification amount by adjusting the water level of the water stored in the first water tank 150. In other words, the processor 170 may identify the target water level of the first water tank 150 according to a user input or the detected external humidity value, and the processor 170 may adjust the water level of the first water tank 150 by comparing the identified target water level of the first water tank 150 and the detected water level of the first water tank 150. In this case, the first water tank 150 may be connected to separate water supply device (not illustrated) or water discharge device (not illustrated) through a pump, a valve, a water supply pipe, or the like, and the processor 170 may adjust the amount of water stored in the first water tank 150 by receiving the water from the water supply device by controlling the pump, the valve, the water supply pipe, or the like connected to the water supply device. Conversely, the processor 150 may adjust the amount of water stored in the first water tank 150 by discharging the water stored in the first water tank 150 by controlling the pump, the valve, the water supply pipe, or the like connected to the water discharge device. In this case, the amount of water supplied to the second water tank 232 may vary depending on the amount of water stored in the first water tank 150, and as the amount of water stored in the first water tank 150 is large, the amount of water supplied to the second water tank 232 may increase. Accordingly, the processor 170 may increase the humidification amount by increasing the amount of water stored in the first water tank 150, and decrease the humidification amount by decreasing the amount of water stored in the first water tank 150.

[0120] While preferred embodiments of the disclosure have been shown and described, the disclosure is not limited to the aforementioned specific embodiments, and it is apparent that various modifications can be made by those having ordinary skill in the technical field to which the disclosure belongs, without departing from the gist

of the disclosure as claimed by the appended claims. Also, it is intended that such modifications are not to be interpreted independently from the technical idea or prospect of the disclosure.

Claims

1. A humidification module comprising:

a housing including a lower part to store water and a guide part to guide droplets generated from the stored water in the lower part of the housing to an upper part of the housing; and a fan configured to guide heated air to the housing, wherein the housing comprises:

a first flow path through which a first part of the heated air guided by the fan passes through the lower part of the housing and is guided with the droplets to the upper part of the housing by the guide part; and a second flow path through which a second part of the heated air guided by the fan that vaporizes the droplets guided with the first part of the heated air passes and is guided to the upper part of the housing by the guide part.

2. The humidification module according to claim 1, wherein the housing further comprises a branch pipe between the guide part and the fan, and

a lower part of the branch pipe comprises a first leakage part through which the first part of the heated air flows to the first flow path, and an upper part of the branch pipe comprises a second leakage part through which the second part of the heated air flows to the second flow path.

3. The humidification module according to claim 2, wherein the first part of the heated air flows from the branch pipe to the first leakage part, passes the lower part of housing, and is guided to the upper part of the housing with droplets by the guide part, and wherein the second part of the heated air flows from the branch pipe to the second leakage part and is guided to the upper part of the housing by the guide part.

4. The humidification module according to claim 2, wherein the first leakage part and the second leakage part of the branch pipe are at a location higher than a water level of the water stored in the lower part of the housing.

5. The humidification module according to claim 1, wherein the first flow path and the second flow path has a common section in which the first part of the heated air and the second part of the heated air are mixed with each other. 5
6. The humidification module according to claim 5, wherein the housing further comprises a mixing part at a starting point of the common section and in which the first part of the heated air and the second part of the heated air are mixed with each other and flow. 10
7. The humidification module according to claim 6, wherein the mixing part comprises a guide, and wherein the guide of the mixing part causes the first part of the heated air and the second part of the heated air to flow in a spiral direction and the droplets to vaporize. 15
8. The humidification module according to claim 1, wherein the housing further comprises a discharge part configured to discharge the droplets vaporized by the heated air to outside of the humidification module. 20
9. The humidification module according to claim 1, further comprising:
- a branch pipe;
 - a heater between the branch pipe and the fan, the heater being configured to heat external air sucked through by the fan and supply the heated air to the branch pipe. 30
10. A home appliance comprising a humidification module, the home appliance comprising:
- a memory to store at least one instruction; and a processor configured to be communicatively coupled to the memory to control the home appliance, 40
 - wherein the humidification module comprises:
 - a fan configured to suck external air;
 - a heater configured to be connected to the fan, heat the external air sucked through the fan and supply heated air; and 45
 - a housing including a lower part to store water and a guide part to guide droplets generated from the stored water in the lower part of the housing to an upper part of the housing, and 50
- wherein the housing comprises:
- a first flow path through which a first part of the heated air passes through the lower part of the housing and is guided with the drop- 55
- lets to the upper part of the housing by the guide part.
- a second flow path through which a second part of the heated air that vaporizes the droplets guided with the first part of the heated air passes and is guided to the upper part of the housing by the guide part; and a mixing part in which the first part of the heated air and the second part of the heated air are mixed with each other and flow.
11. The home appliance according to claim 10, wherein the home appliance further comprises a first water tank to store water,
- the humidification module further comprises a second water tank to store water introduced from the first water tank,
- the housing further comprises an opening to connect the first water tank and the second water tank, and
- the first water tank and the second water tank are connected through a water supply pipe.
12. The home appliance according to claim 11, further comprising:
- a water level detection sensor configured to detect a water level of the second water tank, wherein the processor is configured to adjust an amount of the first part of the heated air moving through the first flow path by adjusting an amount of water introduced from the first water tank to the second water tank based on the water level of the second water tank detected through the water level detection sensor.
13. The home appliance according to claim 11, further comprising:
- a user interface,
- wherein the processor is configured to, based on a user input to adjust a humidification amount of the home appliance being obtained through the user interface, adjust an amount of the first part of the heated air moving through the first flow path by adjusting an amount of water introduced from the first water tank to the second water tank based on the user input.
14. The home appliance according to claim 10, further comprising:
- a user interface,
- wherein the processor is configured to:
- obtain a user input to adjust a humidification amount of the home appliance through the

user interface; and
adjust an amount of the external air sucked
through the fan based on the user input.

15. The home appliance according to claim 11, further comprising: 5

a user interface; and
a humidity sensor to detect an external humidity
of the home appliance, 10
wherein the processor is configured to adjust an
amount of the first part of the heated air moving
through the first flow path by adjusting an
amount of water introduced from the first water
tank to the second water tank by comparing a 15
humidity setting value input through the user in-
terface and the external humidity detected
through the humidity sensor.

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FIG. 1

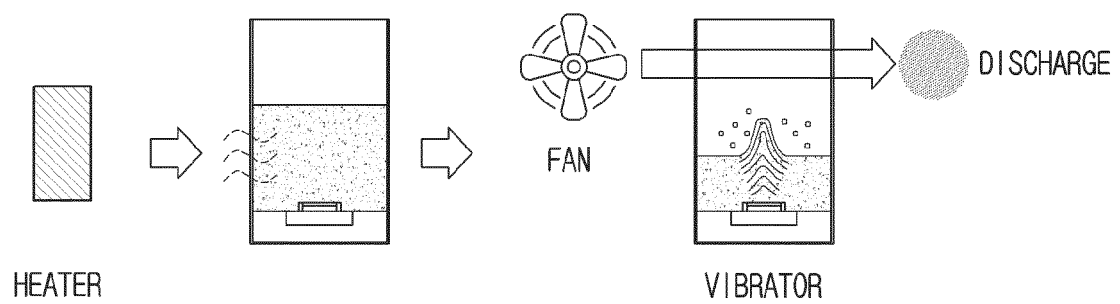


FIG. 2

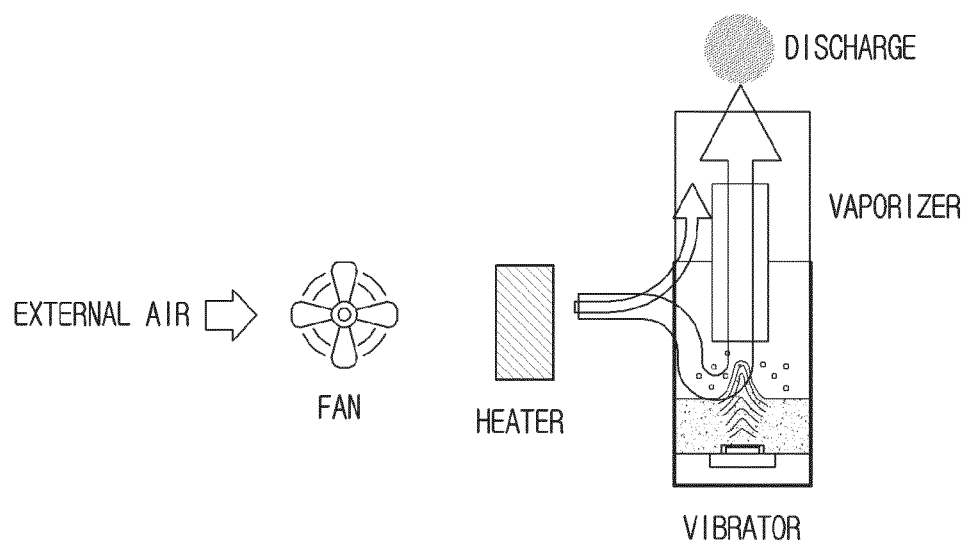


FIG. 3

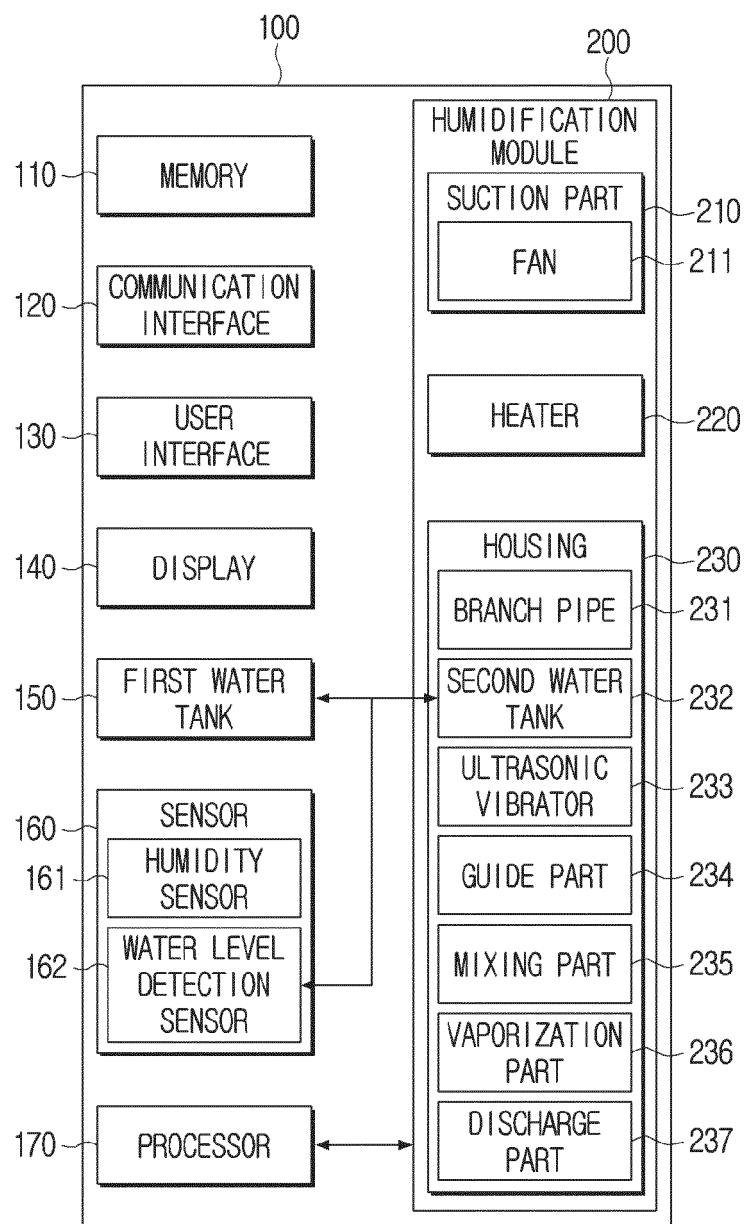


FIG. 4A

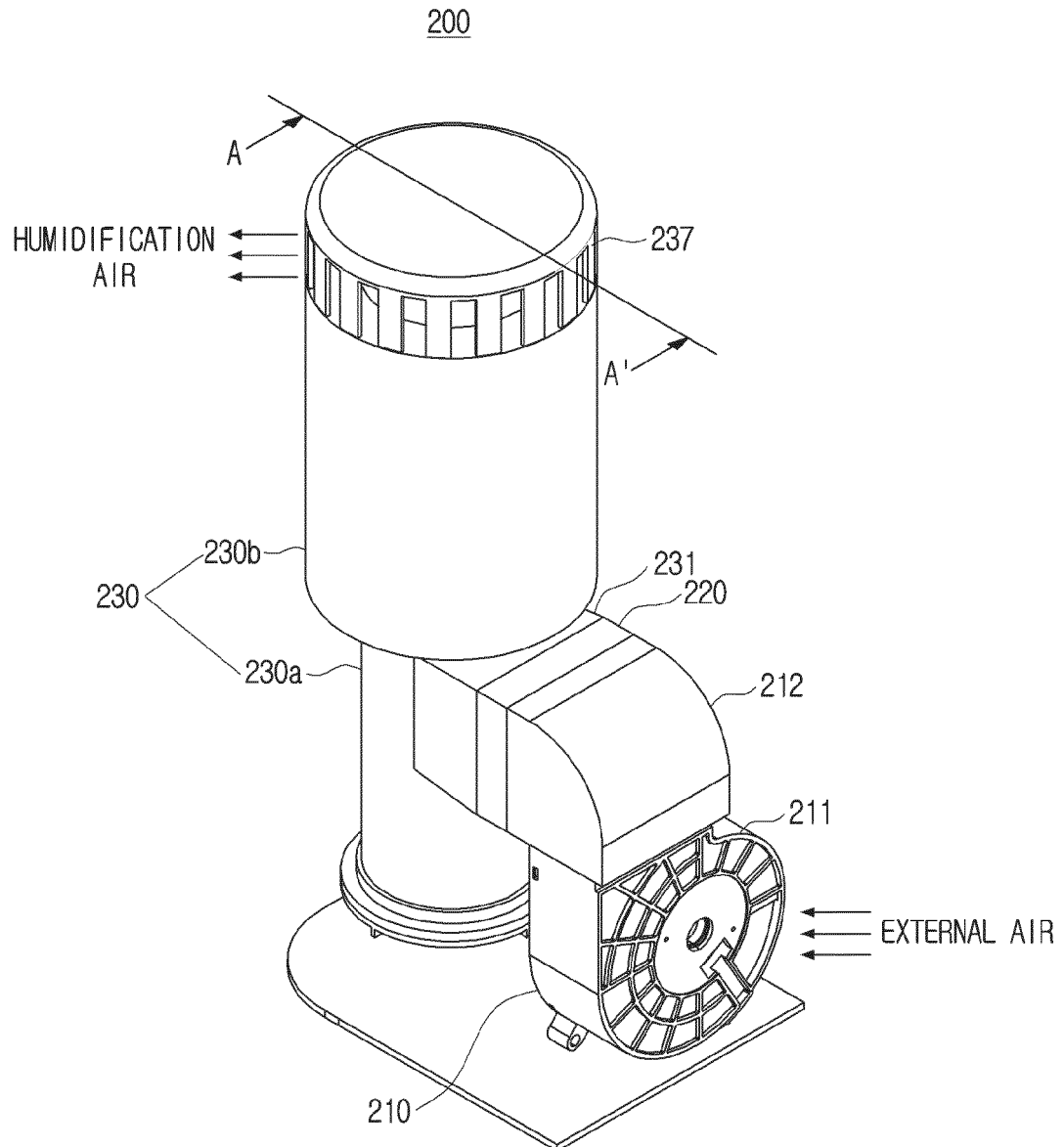


FIG. 4B

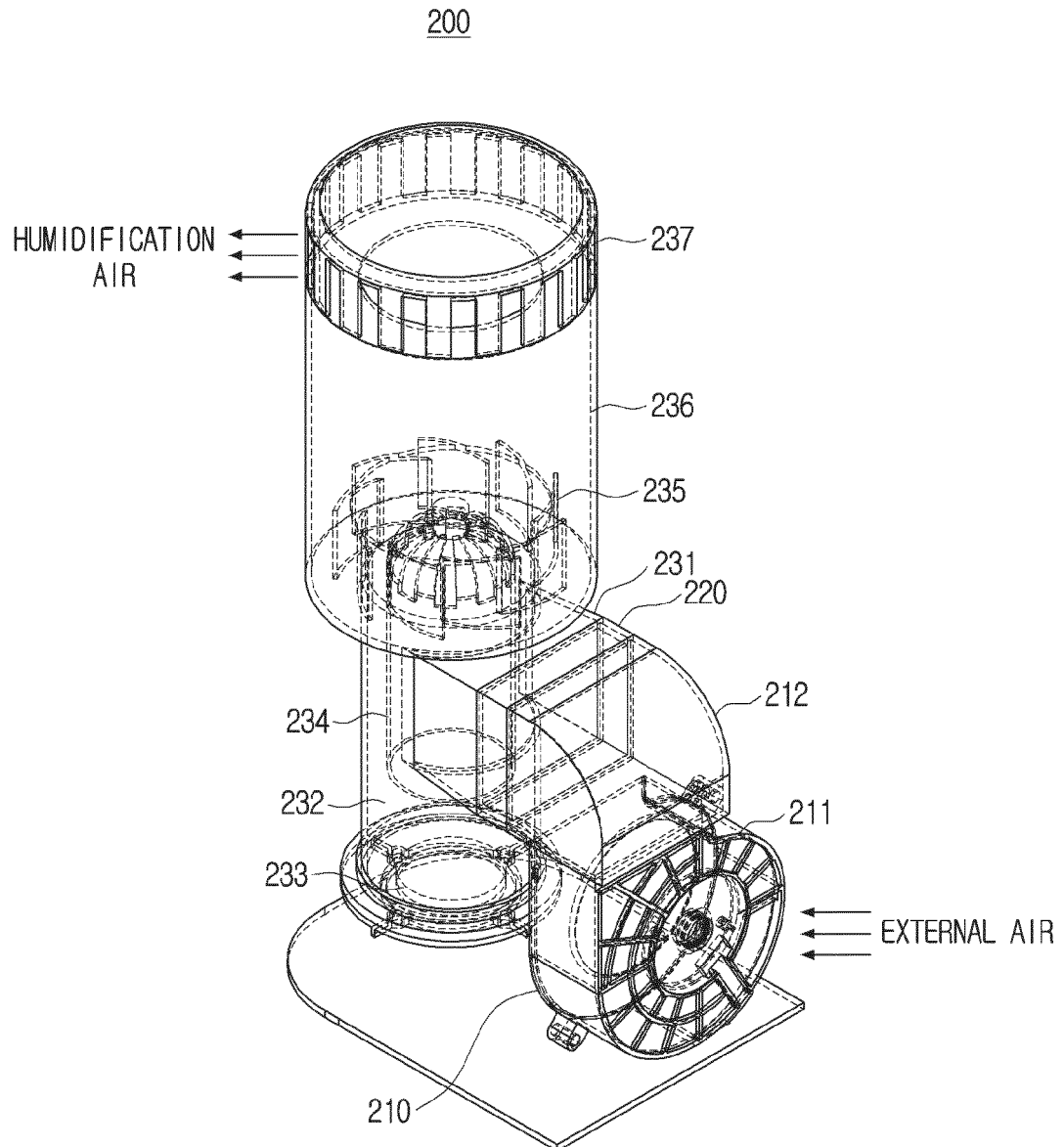


FIG. 5

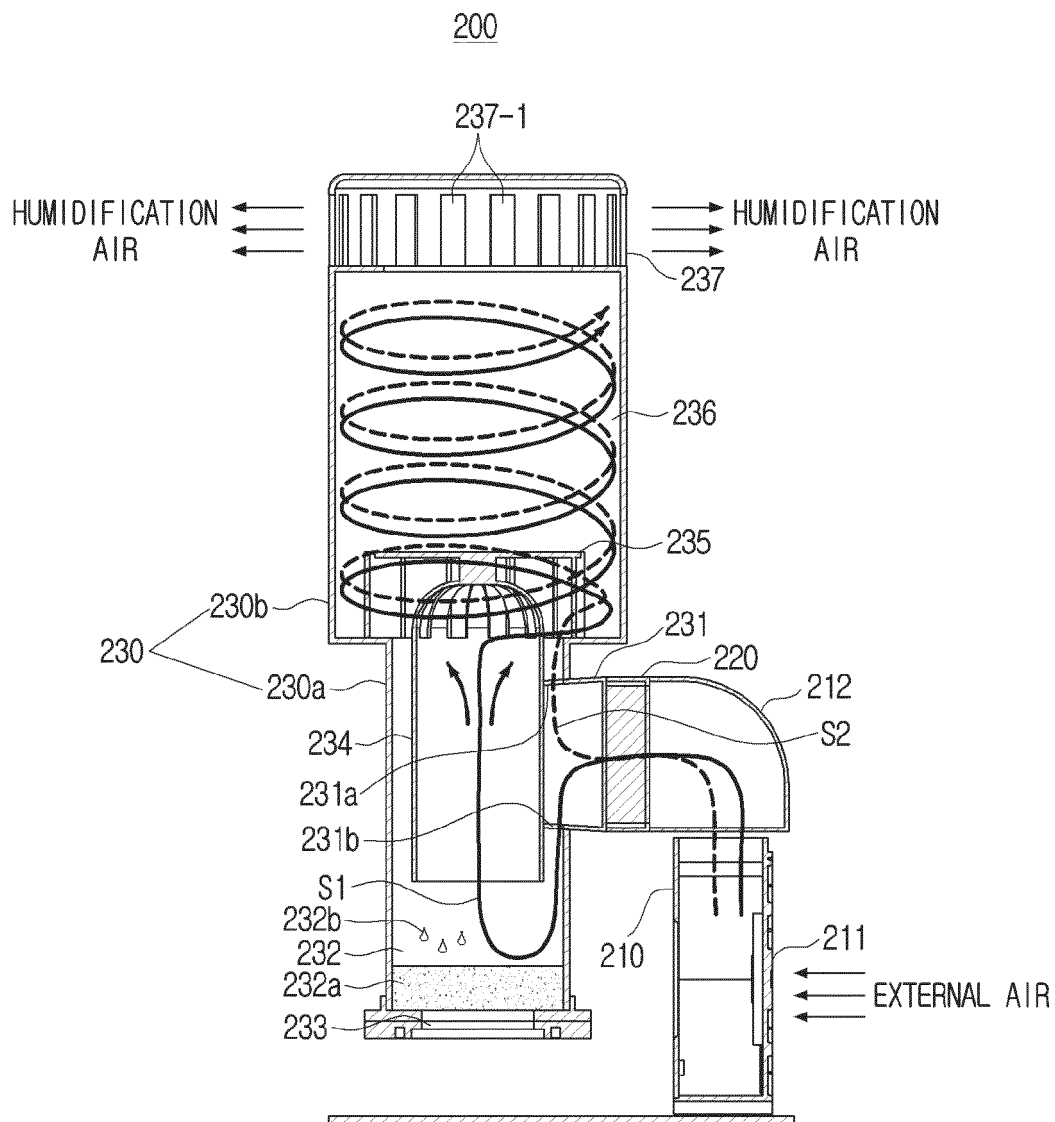


FIG. 6A

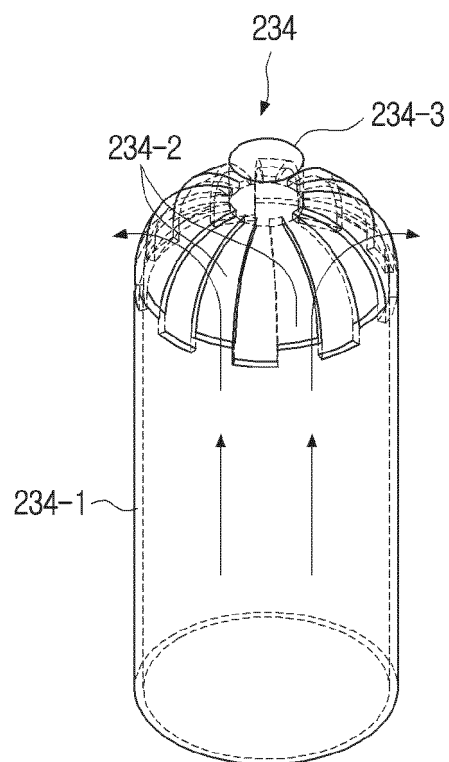


FIG. 6B

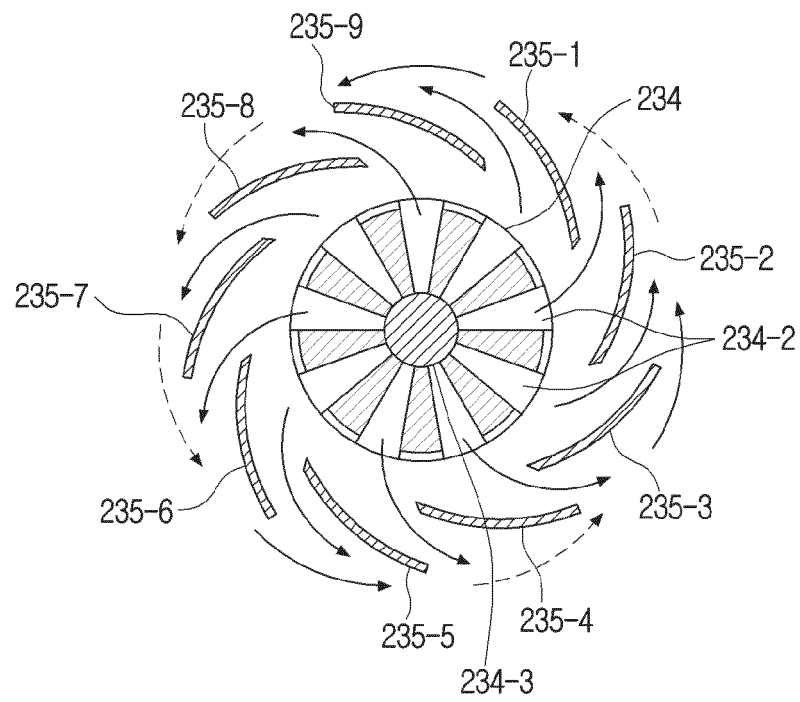


FIG. 7A

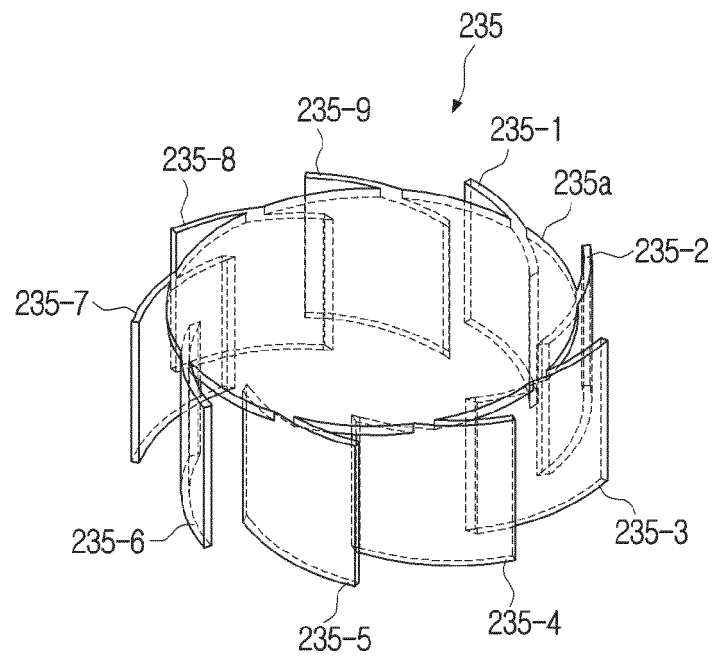


FIG. 7B

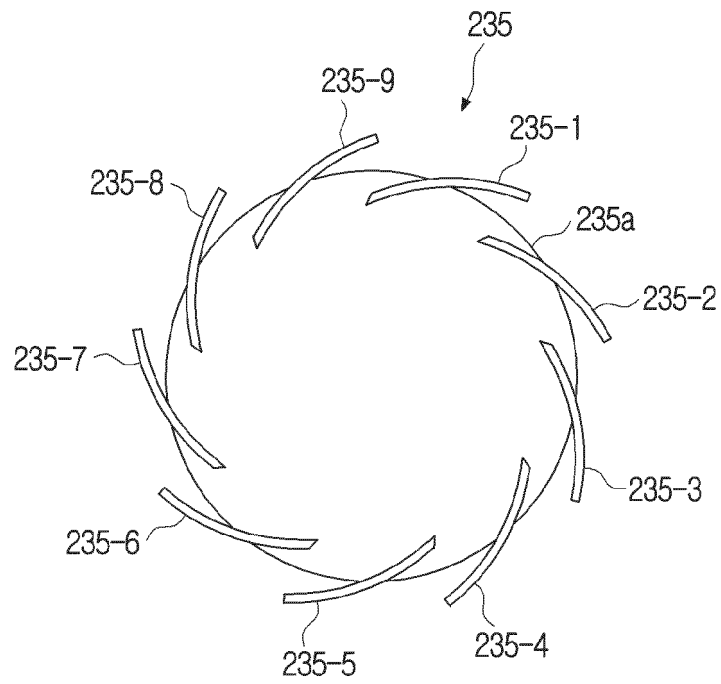


FIG. 8

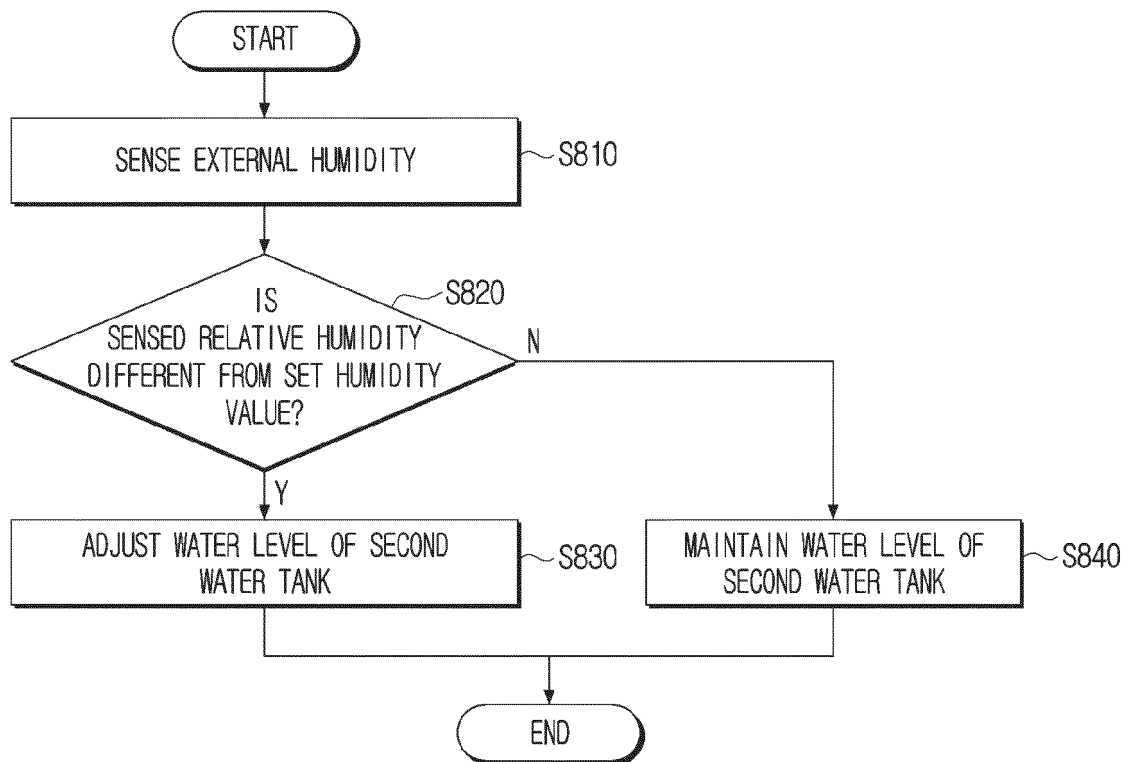
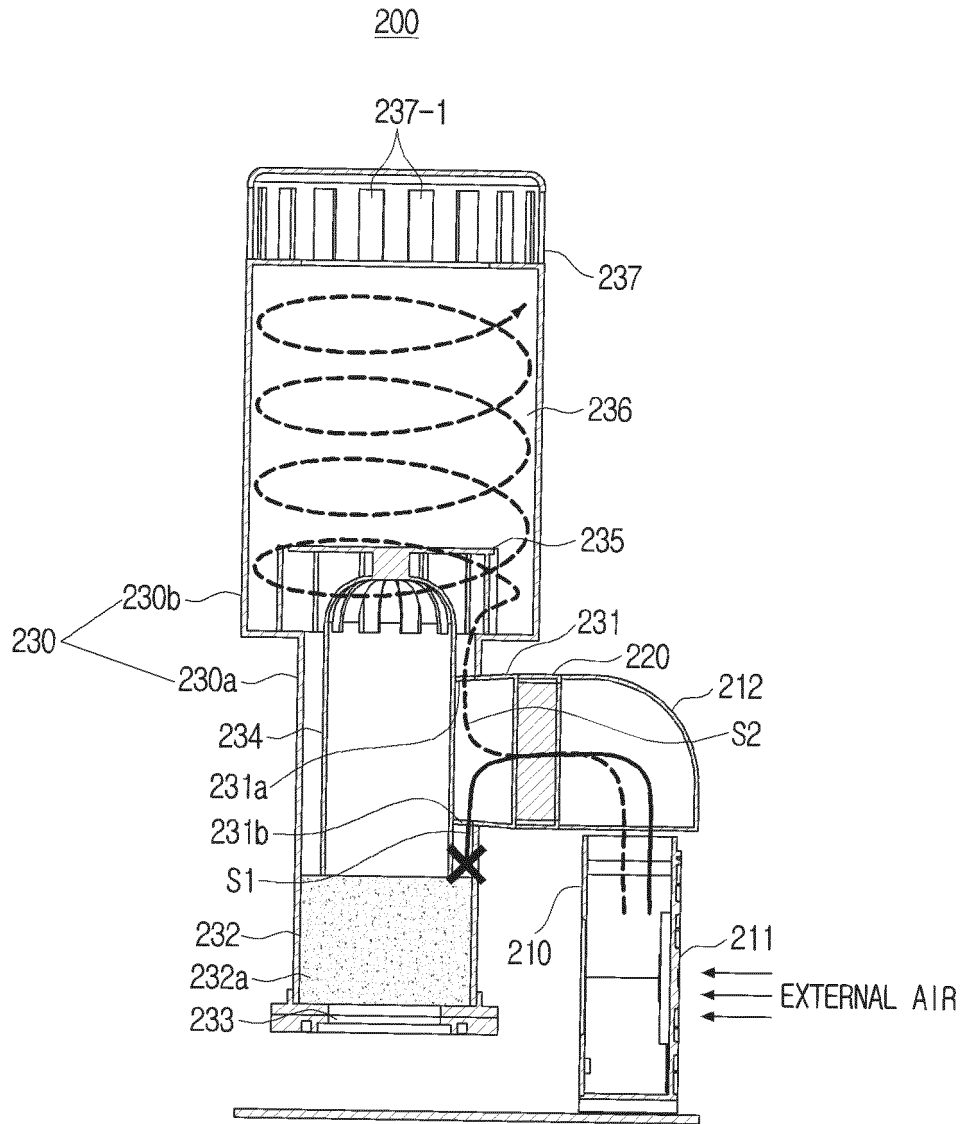


FIG. 9



INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2023/000375

A. CLASSIFICATION OF SUBJECT MATTER

F24F 6/02(2006.01)i; F24F 13/20(2006.01)i; F24F 13/10(2006.01)i; F24F 13/08(2006.01)i; F24F 11/00(2006.01)i;
F24F 11/52(2018.01)i; F24F 6/00(2006.01)i; F24F 110/20(2018.01)i; F24F 140/00(2018.01)i

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)

F24F 6/02(2006.01); B01F 3/04(2006.01); F24F 11/02(2006.01); F24F 6/00(2006.01); F24F 6/10(2006.01);
F24F 6/12(2006.01)

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

Korean utility models and applications for utility models: IPC as above
Japanese utility models and applications for utility models: IPC as above

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

eKOMPASS (KIPO internal) & keywords: 가습(humidification), 액적(droplet), 가이드(guide), 팬(fan), 히터(heater), 유로
(passage), 혼합(mix), 나선(spiral), 초음파(ultrasonic waves)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JP 2010-054146 A (MITSUBISHI ELECTRIC CORP.) 11 March 2010 (2010-03-11) See paragraphs [0009]-[0015], [0018] and [0029] and figures 1 and 7.	1-2,4-6,8-15
Y		7
A		3
Y	US 7350773 B2 (FRENCH et al.) 01 April 2008 (2008-04-01) See column 6, lines 11-46 and figures 8-9.	7
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☒ Further documents are listed in the continuation of Box C. ☒ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
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INTERNATIONAL SEARCH REPORT

International application No.

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C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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