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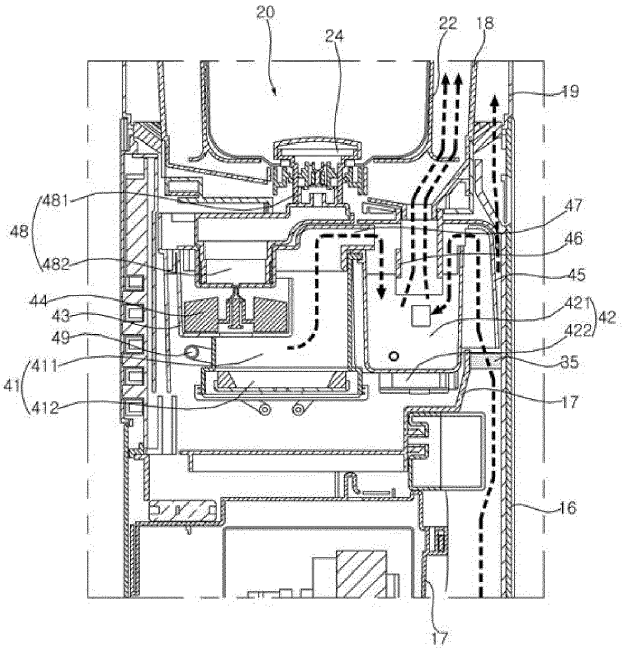
(54) **HUMIDIFIER**

(57) The present disclosure relates to a humidifier. A humidifier according to one aspect of the present disclosure includes: an outer case with an intake opening; a discharge opening that opens to the outside of the outer case; an inner case spaced inward from the outer case; a fan disposed inside the outer case; a humidification assembly disposed inside the inner case and positioned downstream from the fan, that includes a humidification device internally having a space; a air flow path formed between the outer case and the inner case, that extends toward the discharge opening; and an inlet that branches off from the air flow path and allows a space between the outer case and the inner case and the internal space of the humidification device to communicate with each other. Thus, part of blown air can be admitted into the humidification device and then sprayed.

FIG. 4



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Description

BACKGROUND

Field

[0001] The present disclosure relates to a humidifier, and more particularly, to a humidifier that supplies clean humidified air.

Related Art

[0002] A humidifier is an appliance that supplies moisture-containing air within a room. The humidifier is equipped with a water reservoir for storing water, and is classified as ultrasonic humidifier, heated humidifier, natural evaporative humidifier, or hybrid humidifier depending on the method of humidification.

[0003] Ultrasonic humidifiers are equipped with a vibrator to create vibrations from ultrasonic waves, and convert water into fine particles using the vibrations from the vibrator and spray them.

[0004] Ultrasonic humidifiers have advantages such as converting the water stored in the water reservoir into fine particles and spraying large amounts of mist.

[0005] However, conventional humidifiers are problematic in that the device may have a poor state of cleanliness because of the stagnant water in the device. As such, air sprayed from the device can be highly contaminated.

[0006] Another problem with conventional humidifiers is that blown air containing fine dust or the like may cause degradation in the cleanliness of humidified air sprayed from them. The fine dust contained in the blown air is deposited in water droplets, thus leading to high contamination of the humidified air.

[0007] KR 10-2022-0105488 discloses a humidifier. This humidifier, however, is problematic in that the device may have a poor state of cleanliness because of water remaining in a water reservoir. Another problem is that this humidifier is not capable of supplying clean air in mixture because of its monolithic flow path of humidified air.

[0008] KR 10-2018-0094813 discloses a humidifier that supplies heated mummified air. However, his humidifier has the problem of the increased droplet size because a humidification flow path and a heating flow path are provided separately. Another problem with this humidifier is that, the heater operates continuously even with a small heating load, which leads to supply of humidified air that has an unnecessarily high temperature and excessive consumption of energy.

SUMMARY

[0009] The present disclosure is directed to overcoming the above problems and others.

[0010] Another aspect of the present disclosure is to supply clean humidified air.

[0011] Yet another aspect of the present disclosure is to separate and combine a humidification flow path and a cleaning flow path.

[0012] A further aspect of the present disclosure is to optimally mix humidified flow and cleaning flow.

[0013] A further aspect of the present disclosure is to improve the cleanliness of humidified flow.

[0014] A further aspect of the present disclosure is to combine air in a heating flow path and air in a humidification flow path.

[0015] A further aspect of the present disclosure is to simplify a flow path structure.

[0016] A further aspect of the present disclosure is to minimize flow resistance.

[0017] A further aspect of the present disclosure is to guide a flow of air in a given direction.

[0018] A further aspect of the present disclosure is to improve air heating and humidification efficiency.

[0019] The aspects of the present disclosure are not limited to the foregoing, and other aspects not mentioned herein will be able to be clearly understood by those skilled in the art from the following description.

[0020] The object is solved by the features of the independent claims Preferred embodiments are given in the dependent claims.

[0021] To accomplish the foregoing aspects, a humidifier according to an aspect of the present disclosure includes: an outer case with an intake opening.

[0022] The humidifier includes a discharge opening that opens to the outside of the outer case.

[0023] The humidifier includes an inner case spaced inward from the outer case.

[0024] The humidifier includes a fan disposed inside the outer case.

[0025] The humidifier includes a humidification assembly disposed inside the inner case and positioned downstream from the fan, that includes a humidification device internally having a space.

[0026] The humidifier includes a air flow path formed between the outer case and the inner case, that extends toward the discharge opening.

[0027] The humidifier includes an inlet that branches off from the air flow path and allows a space between the outer case and the inner case and the internal space of the humidification device to communicate with each other. Thus, part of blown air may be admitted to the humidification device and converted into mist.

[0028] In one or more embodiments, a part of air blown by the fan may enter the internal space of the humidification device through the inlet, and the rest may flow toward the discharge opening through the blown air flow path.

[0029] In one or more embodiments, the humidifier may further include a humidification flow path through which air admitted into the humidification device through the inlet flows.

[0030] In one or more embodiments, humidification

flow path may be separated from the blown air flow path.

[0031] In one or more embodiments, the humidification flow path may be formed inside the inner case.

[0032] In one or more embodiments, the air flow path may be formed between the outer case and the inner case to surround the humidification flow path.

[0033] In one or more embodiments, the humidifier may further include an inner grille disposed between the outer case and the inner case and positioned downstream of the inlet.

[0034] In one or more embodiments, the air admitted into the humidification device through the inlet and the air in the air flow path may combine at the discharge opening.

[0035] In one or more embodiments, the inlet may protrude from the inner case toward the outer case, and may be spaced inward from the outer case.

[0036] In one or more embodiments, the humidifier may further include a guide disposed between the fan and the inlet.

[0037] In one or more embodiments, the guide may extends toward the inlet.

[0038] In one or more embodiments, a plurality of guides may be provided along the circumference of the inner case in such a way as to protrude from the inner case toward the outer case and be spaced apart from each other.

[0039] In one or more embodiments, the humidifier may further include an auxiliary fan disposed at the inlet.

[0040] In one or more embodiments, the auxiliary fan may blows air into the humidification device.

[0041] In one or more embodiments, the humidification device may include a humidification chamber internally having a space.

[0042] In one or more embodiments, the inlet may extend in a curve from the bottom of the humidification chamber toward the top.

[0043] In one or more embodiments, the humidifier may further include a chamber intake through which the air in the inlet is admitted into the humidification device.

[0044] In one or more embodiments, the humidifier may further include a mist intake that faces the chamber intake and extends downward toward the internal space of the humidification device.

[0045] A humidifier according to an aspect of the present disclosure includes: a case with an intake opening; a fan disposed inside the case; a discharge opening that opens to the outside of the case; a humidification assembly disposed downstream from the fan and internally having a space; a humidification flow path that connects the humidification device and the discharge opening, and through which mist produced by the humidification device flows; an inlet through which air blown from the fan flows, and that is connected to the internal space of the humidification device; and a mist intake that connects the humidification device and the humidification flow path, has an outer wall facing the inlet, and extends toward the internal space of the humidification device. Thus, the air admitted through the inlet may be dispersed into the humidification device along the mist intake.

[0046] In one or more embodiments, the air admitted to the humidification device through the inlet may flow downward along the mist intake.

[0047] In one or more embodiments, a lower end of the mist intake may be positioned in the internal space of the humidification device and positioned below the inlet.

[0048] In one or more embodiments, the humidification device may include: a humidification chamber internally having a space; and a vibrating device attached to the bottom of the humidification chamber.

[0049] In one or more embodiments, the inlet may extend from the bottom of the humidification chamber toward the top and may be attached to the top of the humidification chamber.

[0050] In one or more embodiments, the mist intake may extend downward toward the vibrating device.

[0051] In one or more embodiments, the humidification device may include a chamber intake connected to the inlet.

[0052] In one or more embodiments, the chamber intakemay be positioned above the lower end of the mist intake.

[0053] In one or more embodiments, the mist intake may be spaced apart from the chamber intake.

[0054] In one or more embodiments, the humidifier may further include an outlet port that is positioned above the inlet and connects the mist intake and the humidification flow path.

[0055] In one or more embodiments, the mist intake may extend from the outlet port toward the internal space of the humidification device.

[0056] In one or more embodiments, the humidifier may further include a heating device including a heating chamber internally having a space and a heater attached to the heating chamber.

[0057] In one or more embodiments, the humidifier may further include a connector connecting the heating chamber and the humidification device.

[0058] In one or more embodiments, the mist intake may face the connector and protrude downward from the connector.

[0059] Specific details of other embodiments are included in the detailed description and the drawings.

[0060] According to at least one of the embodiments of the present disclosure, a humidifier may have various modes by providing different flow paths: a humidification flow path and a cleaning flow path.

[0061] According to at least one of the embodiments of the present disclosure, clean humidified air may be supplied since the humidification flow path and the cleaning flow path combine near the discharge opening.

[0062] According to at least one of the embodiments of the present disclosure, a simplified flow path structure can be provided since the humidification flow path branches off from the cleaning flow path and connects

into the humidification assembly.

[0063] According to at least one of the embodiments of the present disclosure, a flow of air can be guided in a given direction with less flow resistance since the humidified air flows upward along a wall surface of the water reservoir.

[0064] According to at least one of the embodiments of the present disclosure, the cleanliness of water mist to be sprayed can be improved by heating water in a heating chamber.

[0065] According to at least one of the embodiments of the present disclosure, the temperature of the humidified air can be increased by allowing the heating chamber and a humidification chamber to communicate with each other.

[0066] According to at least one of the embodiments of the present disclosure, the direction of discharged air can be regulated by regulating the flow of air admitted to the humidification assembly by controlling the operation of the auxiliary fan.

[0067] According to at least one of the embodiments of the present disclosure, the air admitted to the humidification assembly can remain there for a longer period of time owing to a port structure of the humidification assembly, thereby improving humidification efficiency.

[0068] The effects of the present disclosure are not limited to the foregoing, and other effects not mentioned herein will be able to be clearly understood by those skilled in the art from the following description.

BRIEF DESCRIPTION OF THE DRAWINGS

[0069]

FIG. 1 is a perspective view of a humidifier according to an embodiment of the present disclosure.

FIG. 2 is an exploded view of a humidifier according to an embodiment of the present disclosure.

FIG. 3 is a cross-sectional view of a humidifier according to an embodiment of the present disclosure.

FIG. 4 is a partial cross-sectional view of a humidifier of an embodiment of the present disclosure.

FIG. 5 is a perspective view of a humidifier of to an embodiment of the present disclosure, part of which was removed.

FIG. 6 is a partial cross-sectional view according to an embodiment of the present disclosure.

FIG. 7 is a perspective view of a humidifier according to an embodiment of the present disclosure, part of which was removed.

FIG. 8 is a perspective view of a humidifier according to an embodiment of the present disclosure, part of which was removed.

FIG. 9 is a partial cross-sectional view of a humidifier of an embodiment of the present disclosure.

FIG. 10 is a partial cross-sectional view of a humidifier of another embodiment of the disclosure.

FIG. 11 shows part of a humidification assembly of another embodiment of the present disclosure.

FIG. 12 is a perspective view of a humidifier according to an embodiment of the present disclosure, part of which was removed.

FIG. 13 is a perspective view of a humidifier according to an embodiment of the present disclosure, part of which was removed.

FIG. 14 shows an upper part of a cross-sectional view of a humidifier according to an embodiment of the present disclosure.

DESCRIPTION OF EXEMPLARY EMBODIMENTS

[0070] Hereinafter, the embodiments disclosed in the present specification will be described in detail with reference to the accompanying drawings. The same or similar elements will be assigned the same reference numerals irrespective of the reference numerals, and redundant descriptions thereof will be omitted.

[0071] The suffixes "module" and "unit" for elements used in the following embodiments are given or interchangeably used in consideration of only the ease of drafting the specification and do not have a meaning or role distinct from each other.

[0072] In describing the embodiments disclosed in the present specification, a detailed description of a related known technology will be omitted when it is deemed that it may unnecessarily obscure the subject matter of the present disclosure. Also, it should be understood that the appended drawings are intended only to help understand the embodiments disclosed in the present specification and do not limit the technical idea disclosed in the present disclosure; rather, it should be understood that all changes, equivalents, and substitutions included in the technical scope and spirit of the present disclosure are included.

[0073] Terms such as 'first', 'second', etc., may be used to describe various components, but the components are not to be construed as being limited to the terms. The terms are used only to distinguish one component from another component.

[0074] It is to be understood that when one element is referred to as being "connected to" or "coupled to" another element, it may be connected directly to or coupled directly to another element or be connected to or coupled to another element, having the other element intervening therebetween. On the other hand, it is to be understood that when one element is referred to as being "connected directly to" or "coupled directly to" another element, it may be connected to or coupled to another element without the other element intervening therebetween.

[0075] The singular expressions may include plural expressions unless the context clearly dictates otherwise.

[0076] Referring to FIG. 1, a humidifier 1 will be described.

[0077] FIG. 1 is a perspective view of the humidifier 1.

[0078] The humidifier 1 may include a case 10. The case 10 may internally have a space. The case 10 may

be cylindrical.

[0079] The humidifier 1 may include an intake opening 11. The intake opening 11 may be formed around the circumference of the case 10. Air from outside the humidifier 1 may enter the case 10 through the intake opening 11.

[0080] The humidifier 1 may include a discharge opening 12. The discharge opening 12 may be formed on the top of the case 10. Air drawn into the case 10 may be discharged out of the case 10 through the discharge opening 12.

[0081] The humidifier 1 may include a base 13. The base 13 may be disposed at the bottom of the case 10. The base 13 may have a larger diameter than the case 10.

[0082] The humidifier 1 may include a water reservoir 20. The water reservoir 20 may be disposed inside the case 10. A space for storage of water may be formed inside the water reservoir 20. The discharge opening 12 may be formed radially outward from the water reservoir 20. The discharge opening 12 may be formed to surround the water reservoir 20.

[0083] Referring to FIG. 2, the humidifier 1 will be described.

[0084] FIG. 2 is an exploded view of the humidifier 1.

[0085] The humidifier 1 may include an intake grille 14. The intake grille 14 may be disposed around the circumference of the case 10. The intake grille 14 may form the intake opening 11. The intake grille 14 may be cylindrical.

[0086] The humidifier 1 may include a discharge grille 15. The discharge grille 15 may be disposed at an upper part of the case 10. The discharge grille 15 may form the discharge opening 12. The discharge grille 15 may be ring-shaped.

[0087] The humidifier 1 may include a first outer case 16. The first outer case 16 may be cylindrical. The intake grille 14 may be attached to and detached from the first outer case 16. The first outer case 16 may form the exterior of the case 10.

[0088] The humidifier 1 may include a first inner case 17. The first inner case 17 may be cylindrical. The first inner case 17 may be disposed radially inward from the first outer case 16. The first outer case 16 and the first inner case 17 may be radially spaced apart from each other

The humidifier 1 may include a second outer case 19. The second outer case 19 may be cylindrical. The second outer case 19 may be disposed above the first outer case 16. The second outer case 19 may form the exterior of the case 10.

[0089] The humidifier 1 may include a second inner case 18. The second inner case 18 may be cylindrical. The second inner case 18 may be disposed above the first inner case 17. The second inner case 18 may be disposed radially inward from the second outer case 19. The second outer case 19 and the second inner case 18 may be radially spaced apart from each other.

[0090] The first outer case 16 and the second outer case 19 may be removably coupled together. Then again, the first outer case 16 and the second outer case 19 may be formed as a single body. The first outer case 16 and the second outer case 19 may be called "outer case".

[0091] The first inner case 17 and the second inner case 18 may be removably coupled together. Then again, the first inner case 17 and the second inner case 18 may be formed into a single body. The first inner case 17 and the second inner case 18 may be called "inner case".

[0092] The humidifier 1 may include a bucket 21. The bucket 21 may be cylindrical with an open top. The bucket 21 may internally have a space for storing water.

[0093] The humidifier 1 may include a bucket housing 22. The bucket housing 22 may surround the bucket 21. The bucket housing 22 may be cylindrical with an open top. The bucket 21 may be disposed inside the bucket housing 22.

[0094] The humidifier 1 may include a bucket cover 23. The bucket cover 23 may be disposed above the bucket 21. The bucket cover 23 may be removably attached to the discharge grille 15.

[0095] The water reservoir 20 may include the bucket 21, the bucket housing 22, and the bucket cover 23. The water reservoir 20 may be disposed inside the inner case 18. The water reservoir 20 and the inner case 18 may be radially spaced apart from each other.

[0096] Referring to FIG. 3, the humidifier 1 will be described.

[0097] FIG. 3 is a vertical cross-sectional view of the humidifier 1.

[0098] The humidifier 1 may include a filter 31. The filter 31 may be disposed inside the intake grille 14. The filter 31 may be cylindrical.

[0099] The humidifier 1 may include a fan 32. The fan 32 may be disposed above the filter 31. The fan 32 may be disposed inside the intake grille 14.

[0100] The humidifier 1 may include a fan motor 33. The fan motor 33 may rotate the fan 32. The fan motor 33 may be disposed above the fan 32.

[0101] The humidifier 1 may include a controller 34. The controller 34 may be disposed inside the case 10. The controller 34 may be disposed between the fan motor 33 and a humidification assembly 40. The controller 34 may control the operation of the fan motor 33 and the humidification assembly 40. The controller 34 may include a plurality of PCB substrates.

[0102] The humidifier 1 may include an auxiliary fan 35. The auxiliary fan 35 may be disposed inside the case 10. The auxiliary fan 35 may be disposed at an entrance of the humidification assembly 40.

[0103] The humidifier 1 may include the humidification assembly 40. The humidification assembly 40 may be disposed inside the case 10. The humidification assembly 40 may be disposed between the water reservoir 20 and the fan 32. The humidification assembly 40 may cause water supplied from the water reservoir 20 to break up into tiny particles and deliver them to the discharge opening 12. Part of air blown by the fan 32 may enter the humidification assembly 40.

[0104] The discharge grille 15 may be disposed between the water reservoir 20 and the outer case 19. The inner case 18 may be disposed between the reservoir 20 and the outer case 19. The discharge grille 15 may be disposed above the inner case 18.

[0105] The discharge opening 12 may include a first discharge opening 121. The first discharge opening 121 may be formed between the outer case 19 and the inner case 18. The air blown by the fan 32 may flow upward through the first discharge opening 121. The first discharge opening 121 may extend in a ring shape. The first discharge opening 121 may be called "blown air flow path".

[0106] The discharge opening 12 may include a second discharge opening 122. The second discharge opening 122 may be formed between the inner case 18 and the water reservoir 20. Humidified air that has passed through the humidification assembly 40 may flow upward through the second discharge opening 122. The second discharge opening 122 may extend in a ring shape. The second discharge opening 122 may be called "humidification flow path".

[0107] The discharge opening 12 may include a mixing discharge opening 123. The mixing discharge opening 123 may be formed above the first discharge opening 121 and the second discharge opening 122. The mixing discharge opening 123 may be formed at the discharge grille 15. The mixing discharge opening 123 may extend in a ring shape. The mixing discharge opening 123 may be formed between the outer case 19 and the bucket cover 23. Air flowing in the first discharge opening 121 and air flowing in the second discharge opening 122 may be mixed together in the mixing discharge opening 123.

[0108] Conceptually, the discharge opening 12 may include the first discharge opening 121, the second discharge opening 122, and the mixing discharge opening 123. Then again, it may refer to a space open toward the outside of the case 10, separated from the above-mentioned components 121, 122, and 123. The discharge opening 12 may open toward the top of the case 10. The discharge opening 12 may be formed at the discharge grille 15. The discharge opening 12 may be formed to surround the water reservoir 20. The air blown by the fan 32 may flow through the discharge opening 12.

[0109] The air flow path 121 may be connected to the discharge opening 12. The humidification flow path 122 may be connected to the discharge opening 12. The air in the air flow path 121 and the air in the humidification flow path 122 may be mixed together in the discharge opening 12.

[0110] Air admitted into the case 10 through the intake grille 14 may pass through a filter 31 and be blown upward by the fan 32. Part of the air blown upward by the fan 32 may enter the humidification assembly 40, and the rest may flow upward through the first discharge opening 121. The air admitted to the humidification assembly 40, containing fine water drops, may flow upward through the second discharge opening 122. The air flowing through the first discharge opening 121 and the humidified air flowing through the second discharge opening 122 may be mixed together in the mixing discharge opening 123 and discharged upward of the humidifier 1.

[0111] Referring to FIG. 4, the humidifier 1 will be described.

[0112] FIG. 4 is a partial vertical cross-sectional view of the humidifier 1.

[0113] The humidifier 1 may include the humidification assembly 40. The humidification assembly 40 may be disposed below the water reservoir 20. Humidified air produced in the humidification assembly 40 may be discharged upward.

[0114] The humidification assembly 40 may include a heating device 41. The heating device 41 may heat water and air admitted into it.

[0115] The heating device 41 may include a heating chamber 411. The heating chamber 411 may internally have a space. The water stored in the water reservoir 20 may be admitted to the heating chamber 411.

[0116] The heating device 41 may include a heater 412. The heater 412 may be attached to the bottom of the heating chamber 411. The heater 412 may apply heat into the heating chamber 411. The heater 412 may heat the water and air admitted into the heating chamber 411.

[0117] The humidification assembly 40 may include a humidification device 42. The humidification device 42 may convert the admitted water into fine water drops and discharge them upward.

[0118] The humidification assembly 42 may include a humidification chamber 421. The humidification chamber 421 may internally have a space. The water heated in the heating device 41 may be admitted to the humidification chamber 421.

[0119] The humidification device 42 may include a vibrating device 422. The vibrating device 422 may be attached to the bottom of the humidification chamber 421. The vibrating device 422 may generate vibrations by using ultrasonic waves. By the operation of the vibrating device 422, the water in the humidification chamber 421 may be converted into fine water drops. The humidification device 42 may work on the same principle as well-known ultrasonic humidifiers.

[0120] The humidification assembly 40 may include a valve housing 43. The valve housing 43 may be attached to the heating device 41. The valve housing 43 may be disposed within the heating chamber 411.

[0121] The humidification assembly 40 may include a valve 44. The valve 44 may be a floating valve. The valve 44 may be movably disposed inside the valve housing 43. The valve 44 may be moved upward and downward within the valve housing 43 and selectively supply water into the heating chamber 411.

[0122] The humidification assembly 40 may include an inlet 45. The inlet 45 may be connected to the humidification device 42. The inlet 45 may be connected to the inside of the humidification chamber 421. Part of the air blown by the fan 32 (see FIG. 3) may enter the humidi-

fication chamber 421 through the inlet 45. The auxiliary fan 35 may be attached to the inlet 45. The auxiliary fan 35 may draw air flowing between the outer case 16 and the inner case 17 into the inlet 45.

[0123] The humidification assembly 40 may include an outlet 46. The outlet 46 may be connected to the humidification device 42. The outlet 46 may protrude toward the inside of the humidification chamber 421. Fine water drops produced by the humidification device 42 may flow upward through the outlet 46.

[0124] The humidification assembly 40 may include a connector 47. The connector 47 may connect the heating device 41 and the humidification device 42. The connector 47 may connect the heating chamber 411 and the humidification chamber 421. The connector 47 may face the outlet 46.

[0125] The humidification assembly 40 may include a supply port 48. The supply port 48 may connect the water reservoir 20 and the heating device 41. The water in the water reservoir 20 may be admitted into the heating device 41 through the supply port 48.

[0126] The supply port 48 may include a first supply port 481. The first supply port 481 may be connected to the water reservoir 20. The first supply port 481 may be connected to the bottom of the bucket housing 22.

[0127] The water reservoir 20 may include a discharge port 24. The discharge port 24 may be disposed at the bottom of the water reservoir 20. The discharge port 24 may be connected to the first supply port 481.

[0128] The supply port 48 may include a second supply port 482. The second supply port 482 may connect the first supply port 481 and the valve housing 43. Water admitted into the first supply port 481 may be admitted into the valve housing 43 through the second supply port 482.

[0129] The humidification assembly 40 may include a connecting pipe 49. The connecting pipe 49 may connect the heating device 41 and the humidification device 42. The connecting pipe 49 may connect the heating chamber 411 and the humidification chamber 421. The water in the heating chamber 411 may be admitted into the humidification chamber 421 through the connecting pipe 49.

[0130] Part of the air flowing between the outer case 16 and the inner case 17 may be admitted to the humidification device 42 through the inlet 45. The air admitted to the humidification device 42, containing fine water drops produced within the humidification device 42, may flow upward through the outlet 46. The air flowing upward through the outlet 46 may flow upward between the water reservoir 20 and the inner case 18.

[0131] The water in the water reservoir 20 may be admitted into the valve housing 43 through the supply port 48. The water in the valve housing 43 may be admitted into the heating device 41 by movement of the valve 44. The water admitted into the heating device 41 may be heated by the heater 412. The water heated within the heating chamber 411 may be admitted into the humidification chamber 421 through the connecting pipe 49. The water admitted into the humidification chamber 421 may be converted into fine water drops by the vibrating device 422. The fine water drops, along with the air admitted through the inlet 45, may flow upward through the outlet 46.

[0132] Referring to FIG. 5, the humidifier 1 will be described.

[0133] FIG. 5 illustrates a humidifier 1 from which the first outer case 16 is removed.

[0134] The humidifier 1 may include a filter mounting space 311. The filter mounting space 311 may be formed inside the intake grille 14. The filter 31 (see FIG. 3) may be disposed in the filter mounting space 311. The air admitted through the intake grille 14 may pass through the filter mounting space 311 and flow upward.

[0135] The humidifier 1 may include a fan housing 321. The fan 32 (see FIG. 3) may be disposed inside the fan housing 321. The fan housing 321 may be disposed above the filter 31 (see FIG. 3).

[0136] The humidifier 1 may include a housing top 322. The housing top 322 may form the top of the fan housing 321. The housing top 322 may be spaced radially outward from the inner case 17. The air blown by the fan 32 (see FIG. 3) may flow upward through a space formed between the inner case 17 and the housing top 322.

[0137] The humidifier 1 may include a guide 171. The guide 171 may protrude radially outward from the inner case 17. The guide 171 may be disposed between the inlet 45 and the fan housing 321. A plurality of guides 171 may be spaced apart from each other in a circumferential direction of the inner case 17. A space between the plurality of guides 171 may vertically face the inlet 45. A space between the plurality of guides 171 may vertically face the housing top 322.

[0138] The humidifier 1 may include an inner grille 59. The inner grille 59 may be disposed above the humidification assembly 40. The inner grille 59 may be disposed radially outward from the inner case 17. The inner grille 59 may be attached to the outer case 19.

[0139] Part of the air blown by the fan 43 (see FIG. 3) may enter the inlet 45. Part of the air blown by the fan 32 may enter the inlet 45 through the space between the plurality of guides 171. The air admitted to the humidification assembly 40 through the inlet 45, containing fine water drops, may be discharged through the discharge opening 12.

[0140] The auxiliary fan 35 may be disposed at the inlet 45. The auxiliary fan 35 may draw the air blown by the fan 32 (see FIG. 3) into the humidification assembly 40.

[0141] The auxiliary fan 35 may include a fan device 351. The fan device 351 may be a turbofan. The fan device 351 may be a sirocco fan.

[0142] The auxiliary fan 35 may include a supporter 352. The supporter 352 may be attached to the fan device 351. The supporter 352 may be fixed to the inlet 45. The supporter 352 may connect the fan device 351 and the inlet 45.

[0143] Part of the air blown by the fan 32 may flow upward through a space between the outer case 16 (see FIG. 3) and the inner case 17 and pass through the inner grille 59. The air that has passed through the inner grille 59 may flow upward and be discharged through the discharge opening 12.

[0144] Referring to FIG. 6, the humidifier 1 will be described.

[0145] FIG. 6 is a vertical cutaway view of the humidifier 1 when viewed obliquely.

[0146] Part of air flowing upward between the outer case 16 and the inner case 17 may enter the inlet 45.

[0147] The auxiliary fan 35 may draw the air between the outer case 16 and the inner case 17 into the humidification device 42 through the inlet 45.

[0148] The guide 171 may vertically face the inlet 45. The guide 171 may be disposed below the auxiliary fan 35.

[0149] The air admitted into the humidification chamber 421 through the inlet 45 may be mixed with water drops produced by the operation of the vibration device 422. The humidified air mixed with the water drops may flow upward through the outlet 46.

[0150] The humidification chamber 421 may communicate with the heating chamber 411. The connector 47 may connect the humidification chamber 421 and the heating chamber 411.

[0151] Air in the heating chamber 411 may be mixed with the air admitted into the humidification chamber 421 and released to the outlet 46. Part of the water admitted into the heating chamber 411 may evaporate and enter the humidification chamber 421 in the form of vapor. The vapor produced in the heating chamber 411 may be mixed with the humidified air in the humidification chamber 421 and released to the outlet 46.

[0152] The air flowing upward from the humidification chamber 421 through the outlet 46 may be admitted between the water reservoir 20 and the inner case 18. The humidified air discharged through the outlet 46 may flow upward between the water reservoir 20 and the inner case 18.

[0153] The humidifier 1 may include an inner cover 50. The inner cover 50 may be connected to the outlet 46. The inner cover 50 may be disposed between the water reservoir 20 and the humidification assembly 40. The air flowing through the outlet 46 may flow upward from the inner cover 50.

[0154] The water reservoir 20 may include a guide rim 25. The guide rim 25 may extend along the circumference of the water reservoir 20. The guide rim 25 may be spaced upward from the outlet 46. The guide rim 25 may be spaced upward from the inner cover 50. The air flowing through the outlet 46 may be dispersed in a circumferential direction of the water reservoir 20 by the guide rim 25. The humidified air dispersed in the circumferential direction of the water reservoir 20 may flow upward between the water reservoir 20 and the inner case 18.

[0155] Part of the air flowing between the outer case 16 and the inner case 17 may flow upward through the inner grille 59. The inner grille 59 may be disposed between the outer case 19 and the inner case 18. The air that has passed through the inner grille 59 may flow upward between the outer case 19 and the inner case 18.

[0156] Referring to FIG. 7, the humidifier 1 will be described.

[0157] FIG. 7 illustrates the humidifier 1, an upper portion of which, including the water reservoir 20, is removed.

[0158] The humidifier 1 may include an inner cover 50. The inner cover 50 may be disposed above the humidification assembly 40 (see FIG. 6). The inner cover 50 may be disposed below the water reservoir 20 (see FIG. 6). The inner cover 50 may be attached to the water reservoir 20 and the humidification assembly 40.

[0159] The inner cover 50 may include a cover plate 51. The cover plate 51 may be disc-shaped.

[0160] The inner cover 50 may include a port insertion portion 52. The port insertion portion 52 may protrude upward from the cover plate 51. The port insertion portion 52 may have a ring shape. The supply port 48 may be inserted into the port insertion portion 52. The discharge port 24 (see FIG. 6) of the water reservoir 20 (see FIG. 6) may be inserted into the port insertion portion 52 and attached to the supply port 48.

[0161] The inner cover 50 may include an outer rim 53. The outer rim 53 may protrude upward from the cover plate 51. The outer rim 53 may have a ring shape. The outer rim 53 may be spaced radially inward from the outer case 19. The inner grille 59 may be disposed between the outer rim 53 and the outer case 19.

[0162] The inner cover 50 may include an outlet insertion opening 54. The outlet insertion opening 54 may be formed through the cover plate 51. The outlet 46 of the humidification assembly 40 may be inserted into the outlet insertion opening 54 and fixed in place. The outlet insertion opening 54 may be positioned between the port insertion portion 52 and the outer rim 53. The air flowing through the outlet 46 may flow upward from the inner cover 50.

[0163] The inner cover 50 may include the inner grille 59. The inner grille 59 may be disposed between the outer rim 53 and the outer case 19. The inner grille 59 may be part of the inner cover 50. The inner grille 59 may be formed integral with the outer rim 53. The inner cover 50 and the inner grille 59, as a single body, may be removed from the outer case 19.

[0164] The air flowing through the outlet 46 may flow upward from inside the outer rim 53. Air that has passed through the inner grille 59 may flow upward from outside the outer rim 53. The inner case 18 (see FIG. 6) may be attached to the top of the outer rim 53. The inner case 18 may divide an inner space and an outer space in a radial direction of the outer rim 53.

[0165] Referring to FIG. 8, the humidifier 1 will be described.

[0166] FIG. 8 is a perspective view of the structure in

FIG. 7 from which the inner cover 50 is removed.

[0167] The inner cover 50 may be removably disposed above the humidification assembly 40. The inner cover 50 may be disposed inside the outer case 19.

[0168] The inner cover 50 may include a port insert hole 55. The port insert hole 55 may be formed through the center of the inner cover 50. The supply port 48 may be inserted into the port insert hole 55 and fixed in place.

[0169] The inner cover 50 may include an outlet penetrating hole 56. The outlet penetrating hole 56 may be formed between the port insertion portion 52 and the outer rim 53. The outlet 46 may penetrate upward through the outlet penetrating hole 56.

[0170] Part of the air admitted through the intake grille 14 may enter the humidification assembly 40 through the inlet 45. The air admitted to the humidification assembly 40 may be discharged upward through the outlet 46.

[0171] The air admitted through the intake grille 14 may flow upward through a space between the inner case 17 and the outer case 19.

[0172] The humidifier 1 may include a gap 192 formed between the humidification assembly 40 and the outer case 19. The gap 192 may be formed between the inner case 17 and the outer case 19. Part of the air blown by the fan 32 (see FIG. 3) that flows between the humidification assembly 40 and the outer case 19 may enter the humidification assembly 40 through the inlet 45. The rest of the air blown by the fan 32 (see FIG. 3) that flows between the humidification assembly 40 and the outer case 19 may flow upward through the gap 192. The inner grille 59 may be disposed above the gap 192.

[0173] Referring to FIG. 9, the humidifier 1 will be described.

[0174] FIG. 9 is a vertical cross-sectional view of the humidification assembly 40.

[0175] The inlet 45 may be connected to the humidification device 42. The air admitted to the inlet 45 may be admitted into the humidification chamber 421.

[0176] The inlet 45 may include an inlet side wall 451. The inlet side wall 451 may extend outward from the humidification device 42.

[0177] The inlet 45 may include a first inlet guide 452. The first inlet guide 452 may extend vertically. The first inlet guide 452 may be slanted in such a way as to become closer to the humidification chamber 421 toward the top. The inlet side wall 451 may connect the humidification chamber 421 and the first inlet guide 452.

[0178] The inlet 45 may include a second inlet guide 453. The second inlet guide 453 may extend in a curve upward from the first inlet guide 452. The second inlet guide 453 may be curved toward the humidification chamber 421.

[0179] The first inlet guide 452 and the second inlet guide 453 may be called "inlet guide". The inlet guide may include the first inlet guide 452 and the second inlet guide 453.

[0180] The humidification device 42 may include a chamber outer wall 423. The chamber outer wall 423 may internally have a space. The chamber outer wall 423 may be spaced apart from the inlet guide 452 and 453. Part of the air blown by the fan 32 (see FIG. 3) may enter the humidification device 42 through a space between the chamber outer wall 423 and the inlet guide 452 and 453.

[0181] The humidification device 42 may include a chamber upper end 4231. The chamber upper end 4231 may be spaced downward from the inlet guide 453. A chamber intake 4232 may be formed between the inlet guide 453 and the chamber upper end 4231.

[0182] The humidification device 42 may include a chamber bottom 4211. The chamber bottom 4211 may be disposed below the chamber outer wall 423. The vibrating device 422 may be attached to the chamber bottom 4211.

[0183] The inlet 45 may include an inlet lower end 453. The inlet lower end 454 may connect the chamber outer wall 423 and the inlet guide 452.

[0184] The inlet lower end 454 may be spaced upward from the chamber bottom 4211. There is a height difference H between the chamber bottom 4211 and the inlet lower end 454.

[0185] The air admitted to the inlet 45 may flow upward along the chamber outer wall 423 and the inlet guide 452.

[0186] The distance between the chamber outer wall 423 and the inlet guide 452 may become smaller toward the top. The distance W1 between the chamber outer wall 423 and the inlet guide 452 may be larger than the distance W2 between the chamber upper end 4231 and the inlet guide 452.

[0187] The outlet 46 may protrude toward the humidification device 42. The air in the humidification chamber 421 may enter the outlet 46 in the form of mist.

[0188] The outlet 46 may include an outlet outer wall 461. The outlet outer wall 461 may protrude toward the inside of the humidification chamber 421. The outlet outer wall 461 may face the chamber intake 4232. Air admitted to the humidification chamber 421 through the chamber intake 4232 may flow downward along the outlet outer wall 461. The outlet outer wall 461 may be called "mist intake".

[0189] The outlet 46 may include an outlet lower end 465. The outlet lower end 465 may be positioned inside the humidification chamber 421. The outlet lower end 465 may be positioned below the chamber upper end 4231.

[0190] The outlet 46 may include an outlet port 462. The outlet port 462 may protrude upward. The outlet port 462 may be inserted into the inner grille 59 (see FIG. 8) and fixed in place.

[0191] The outlet 46 may include an outlet plate 463. The outlet plate 463 may be disposed above the humidification chamber 421. The outlet outer wall 461 and the outlet port 462 may protrude from the outlet plate 463. The chamber intake 4632 may be formed between the outlet plate 463 and the chamber upper end 4231.

[0192] The outlet 46 may include a guide supporter 464. The guide supporter 464 may surround the inlet

guide 453. The guide supporter 464 may extend in a curved shape corresponding to the inlet guide 453.

[0193] Referring to FIGS. 10 and 11, a humidification assembly 400 according to another embodiment of the present disclosure will be described.

[0194] FIG. 10 is partial cross-sectional view of the humidification assembly 400 according to another embodiment of the present disclosure. FIG. 11 is a partial perspective view of the humidification assembly 400 according to another embodiment of the present disclosure.

[0195] The humidification assembly 400 may include a heating device 410, a humidification device 420, an inlet 450, an outlet 460, and a connector 470. The description given with reference to FIGS. 1 to 9 may apply equally to the heating device 410, the humidification device 420, and the connector 470.

[0196] The humidification device 420 may include a humidification chamber 4210, a vibrating device 4220, and a chamber outer wall 4230. The description given with reference to FIG. 9 may apply equally to the humidification chamber 4210, the vibrating device 4220, and the chamber outer wall 4230.

[0197] The outlet 460 may protrude toward the humidification device 420. The air in the humidification chamber 4210 may enter the outlet 460 in the form of mist.

[0198] The outlet 460 may include an outlet outer wall 4610. The outlet outer wall 4610 may protrude toward the inside of the humidification chamber 4210. The air admitted to the humidification chamber 4210 may flow downward along the outlet outer wall 4610.

[0199] The outlet 460 may include an outlet lower end 4650. The outlet lower end 4650 may be positioned inside the humidification chamber 4210.

[0200] The outlet lower end 4650 may include a groove 4651. The groove 4651 may be recessed upward from the outlet lower end 4650.

[0201] The outlet 460 may include an outlet port 4620. The outlet port 4620 may protrude upward. The outlet port 4620 may be inserted into the inner grille 59 (see FIG. 8) and fixed in place.

[0202] The outlet 460 may include an outlet plate 4630. The outlet plate 4630 may be disposed above the humidification chamber 4210. The outlet outer wall 4610 and the outlet port 4620 may protrude from the outlet plate 4630.

[0203] The outlet 460 may include a first inlet body 4640. The first inlet body 4640 may extend in a curve downward from the outlet plate 4630.

[0204] The outlet 460 may include a second inlet body 4660. The second inlet body 4660 may extend downward from the first inlet body 4640. The second inlet body 4660 may face the chamber outer wall 4230.

[0205] The first inlet body 4640 and the second inlet body 4660 may be called "inlet". The inlet may include the first inlet body 4640 and the second inlet body 4660.

[0206] The humidification assembly 400 according to another embodiment of the present disclosure may have the outlet 460 and the inlet as a single body.

[0207] The humidification assembly 400 may include an inlet guide 450. The inlet guide 450 may extend downward from the inlet 4640. The inlet guide 450 may be connected to the chamber outer wall 4230. The inlet guide 450 may be spaced a predetermined gap G downward from a lower end of the inlet 4660.

[0208] Part of air flowing inside the outer case 16 may enter the humidification device 420 through the inlet 4660 and 4640. In this case, the inlet guide 450 may guide the air flowing inside the outer case 16 to the inlet 4660 and 4640.

[0209] The inlet guide 450 may include a first inlet guide 4510. The first inlet guide 4510 may extend downward from the inlet 4660.

[0210] The inlet guide 450 may include a second inlet guide 4520. The second inlet guide 4520 may extend downward from the inlet 4660.

[0211] The first inlet guide 4510 and the second inlet guide 4520 may be spaced apart from each other. A chamber intake space 4530 may be formed between the first inlet guide 4510 and the second inlet guide 4520. The chamber intake space 4530 may be formed below the inlet 4660.

[0212] Referring to FIGS. 12 and 13, the humidifier 1 will be described.

[0213] FIG. 12 is a perspective view of the discharge grille 15, the inner case 18, and the outer case 19, part of which was removed. FIG. 13 is a perspective view of the humidifier 1, an upper portion of which was removed.

[0214] Part of the air admitted through the intake grille 14 may be admitted into the humidification assembly 40 and discharged upward through the humidification flow path 122.

[0215] The humidification flow path 122 may be formed between the bucket housing 22 and the inner case 18. The humidified air produced in the humidification assembly 40 may flow upward along an outer wall of the bucket housing 22.

[0216] Part of the air admitted through the intake grille 14 may flow upward between the inner case 18 and the outer case 19. The air flow path 121 may be formed between the inner case 18 and the outer case 19.

[0217] The inner case 18 may divide the air blown flow path 121 and the humidification flow path 122.

[0218] The water reservoir 20 may have a storage space 28. The storage space 28 may be defined as an inner space of the bucket 21 (see FIG. 2).

[0219] The humidification flow path 122 may be positioned radially outward from the storage space 28. The humidification flow path 122 may be formed to surround the bucket housing 22.

[0220] The air flow path 121 may be positioned radially outward from the humidification flow path 122. The air flow path 121 may be formed to surround the inner case 18.

[0221] The radial width W1 of the air flow path 121 may be smaller than the radial width W2 of the humidification flow path 122. It should be noted that the widths of the

flow paths are not limited to what has been stated just above, but the air flow path 121 and the humidification flow path 122 may be equal in width or the width of the air flow path 121 may be larger than the width of the humidification flow path 122.

[0222] Referring to FIG. 14, the humidifier 1 will be described.

[0223] FIG. 14 shows an upper part of a cross-sectional view of the humidifier 1.

[0224] The bucket 21 may be disposed within the bucket housing 22. An outer wall of the bucket 21 and an outer wall of the bucket housing 22 may be spaced apart from each other.

[0225] The bucket housing 22 may include a housing outer wall 221. The housing outer wall 221 may surround the bucket 21. The housing outer wall 221 may be cylindrical with an open top. The housing outer wall 221 may face the inner case 18. The humidification flow path 122 may be formed between the inner case 18 and the housing outer wall 221.

[0226] The bucket housing 22 may include a housing upper end 222. The housing upper end 222 may form an upper portion of the housing outer wall 221. The housing upper end 222 may be formed integrally with the housing outer wall 221. The housing upper end 222 may extend radially outward from the housing outer wall 221. The housing upper end 222 may have a ring shape. The housing upper end 222 may be bent toward the inner case 18 from the housing outer wall 221.

[0227] The width of the humidification flow path 122 may become narrower toward the top. The gap G1 between the housing outer wall 221 and the inner case 18 may be larger than the gap G2 between the housing upper end 222 and the inner case upper end 181.

[0228] Owing to the above-described structure, the air discharged through the humidification flow path 122 and the air discharged through the air flow path 121 may be efficiently mixed together.

[0229] The water reservoir 20 may include a cap 26. The cap 26 may be attached to the top of the bucket 21. The cap 26 may be disposed radially inward from the housing upper end 222. The cap 26 may surround an upper end of the bucket 21.

[0230] The water reservoir 20 may include a handle 27. The handle 27 may be attached to the top of the bucket 21. The handle 27 may extend along the circumference of the bucket 21. The handle 27 may be movably disposed toward the upper side of the bucket 21.

[0231] The bucket cover 23 may open and close an internal space of the bucket 21. The bucket cover 23 may be removably attached to the bucket 21.

[0232] The bucket cover 23 may include a first cover outer wall 231. The first cover outer wall 231 may have a ring shape. The first cover outer wall 231 may be disposed above the humidification flow path 122. The first cover outer wall 231 may be positioned radially outward from the bucket 21. The first cover outer wall 231 may be spaced upward from the housing upper end 222. The first cover outer wall 231 may vertically face the humidification flow path 122. The discharge grille 15 may be disposed between the first cover outer wall 231 and the outer case 19. The mixing discharge opening 123 may be formed between the first cover outer wall 231 and the outer case 19.

[0233] The bucket cover 23 may include a second cover outer wall 232. The second cover outer wall 232 may have a ring shape. The second cover outer wall 232 may be disposed above the humidification flow path 122. The second cover outer wall 232 may be positioned radially outward from the bucket 21. The second cover outer wall 232 may be spaced upward from the housing upper end 222. The second cover outer wall 232 may vertically face the housing upper end 222. The discharge grille 15 may be disposed between the second cover outer wall 232 and the outer case 19. The mixing discharge opening 123 may be formed between the second cover outer wall 232 and the outer case 19.

[0234] An outer circumferential surface of the bucket cover 23 may be vertically curved. The first cover outer wall 231 may be positioned more contiguous to the outer case 19 than the second cover outer wall 232 is. The first cover outer wall 231 may be curved radially outward from the second cover outer wall 232. The first cover outer wall 231 may extend from the second cover outer wall 232 toward the outer case 19.

[0235] The mixing discharge opening 123 may become narrower in width toward the top. The distance D1 between the second cover outer wall 232 and the outer case 19 may be larger than the distance D2 between the first cover outer wall 231 and the outer case 19.

[0236] As an upper end of the bucket housing 22 and an upper end of the bucket cover 23 are slanted, a flow of the air discharged through the humidification flow path 122 may be guided in a given direction. Also, owing to the above-described structure, the air discharged through the humidification flow path 122 and the air discharged through the air flow path 121 may be efficiently mixed together. Moreover, dew formed at the top of the humidification flow path 122 may fall down from the uppe between which and the water reservoir the humidification flow path is formed r ends of the bucket housing 22 and the bucket cover 23 and collect at the bottom of the water reservoir 20.

[0237] It will be apparent that, although the exemplary embodiments have been shown and described above, the present disclosure is not limited to the above-described specific embodiments, and various modifications and variations can be made by those skilled in the art without departing from the gist of the appended claims. Thus, it is intended that the modifications and variations should not be understood independently of the technical spirit or prospect of the present disclosure

[0238] The present disclosure may be embodied in various modifications, and its scope of rights is not limited by the foregoing embodiments. Thus, the modifications should be construed as falling within the scope of this

disclosure as long as they include components as claimed in the claims of this disclosure.

[0239] Certain embodiments or other embodiments of the disclosure described above are not mutually exclusive or distinct from each other. Any or all elements of the embodiments of the disclosure described above may be combined with another or combined with each other in configuration or function.

[0240] For example, a configuration "A" described in one embodiment of the disclosure and the drawings and a configuration "B" described in another embodiment of the disclosure and the drawings may be combined with each other. Namely, although the combination between the configurations is not directly described, the combination is possible except in the case where it is described that the combination is impossible.

[0241] Although embodiments have been described with reference to a number of illustrative embodiments thereof, it should be understood that numerous other modifications and embodiments can be devised by those skilled in the art that will fall within the scope of the principles of this disclosure. More particularly, various variations and modifications are possible in the component parts and/or arrangements of the subject combination arrangement within the scope of the disclosure, the drawings and the appended claims. In addition to variations and modifications in the component parts and/or arrangements, alternative uses will also be apparent to those skilled in the art.

Claims

1. A humidifier comprising:

an outer case (16) with an intake opening (11);
a discharge opening (12) being opens to the outside of the outer case (16);
an inner case (17) spaced inward from the outer case (16);
a fan (32) disposed inside the outer case (16);
a humidification assembly (40) disposed inside the inner case (17) and positioned downstream from the fan (32), that includes a humidification device (42) internally having a space;
a air flow path (121) formed between the outer case (16) and the inner case (17) , that extends toward the discharge opening (12); and
an inlet (45) that branches off from the air flow path (121) and allows a space between the outer case (16) and the inner case (17) and the internal space of the humidification device (42) to communicate with each other.

2. The humidifier of claim 1, wherein part of air blown by the fan (32) enters the internal space of the humidification device (42) through the inlet (45), and the rest flows toward the discharge opening (12) through the blown air flow path (121).

3. The humidifier of claim 1 or 2, further comprising a humidification flow path (122) through which air admitted into the humidification device (42) through the inlet (45) flows, and that is separated from the blown air flow path (121).

4. The humidifier of claim 3, wherein the humidification flow path (122) is formed inside the inner case (17).

5. The humidifier of claim 3 or 4, wherein the air flow path (121) is formed between the outer case (16) and the inner case (17) to surround the humidification flow path (122).

6. The humidifier of any one of the preceding claims, further comprising an inner grille (59) disposed between the outer case (16) and the inner case (17) and positioned downstream of the inlet (45).

7. The humidifier of any one of the preceding claims , wherein the air admitted into the humidification device (42) through the inlet (45) and the air in the air flow path (121) combine at the discharge opening (12).

8. The humidifier of any one of the preceding claims, wherein the inlet (45) protrudes from the inner case (17) toward the outer case (16), and is spaced inward from the outer case (16).

9. The humidifier of any one of the preceding claims, further comprising a guide (171) disposed between the fan (32) and the inlet (45), that extends toward the inlet (45).

10. The humidifier of claim 9, wherein a plurality of guides (171) are provided along the circumference of the inner case (171) in such a way as to protrude from the inner case (17) toward the outer case (16) and be spaced apart from each other.

11. The humidifier of any one of the preceding claims, further comprising an auxiliary fan (35) disposed at the inlet (45), that blows air into the humidification device (42).

12. The humidifier of any one of the preceding claims, wherein the humidification device (42) includes a humidification chamber (421) internally having a space, wherein the inlet (45) extends in a curve from the bottom of the humidification chamber (421) toward the top.

13. The humidifier of any one of the preceding claims, further comprising:

a chamber intake (4232) through which the air in the inlet (45) is admitted into the humidification device (42); and

a mist intake that faces the chamber intake (4232) and extends downward toward the internal space of the humidification device (42).

FIG. 1

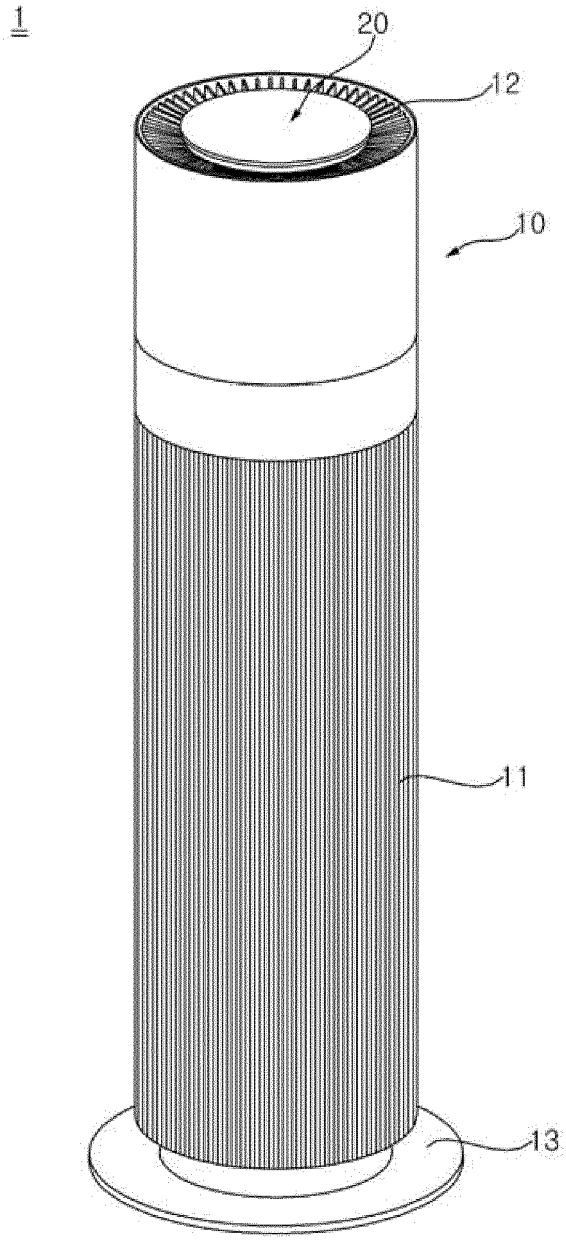

FIG. 2

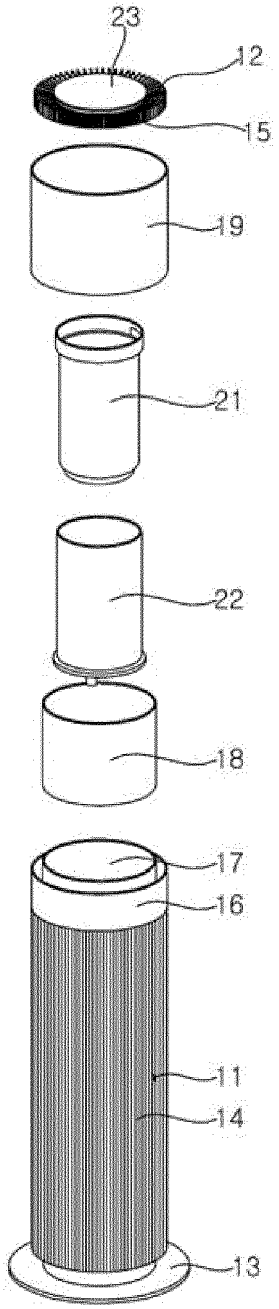

FIG. 3

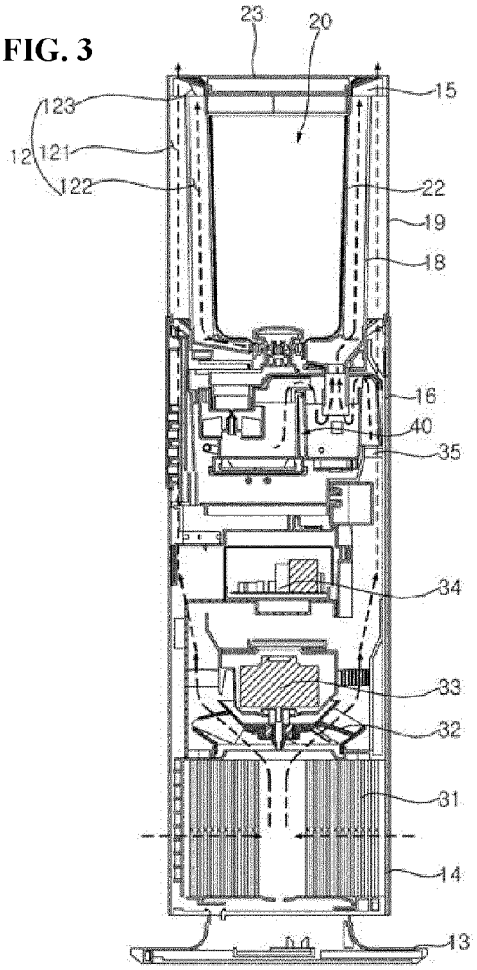
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FIG. 4

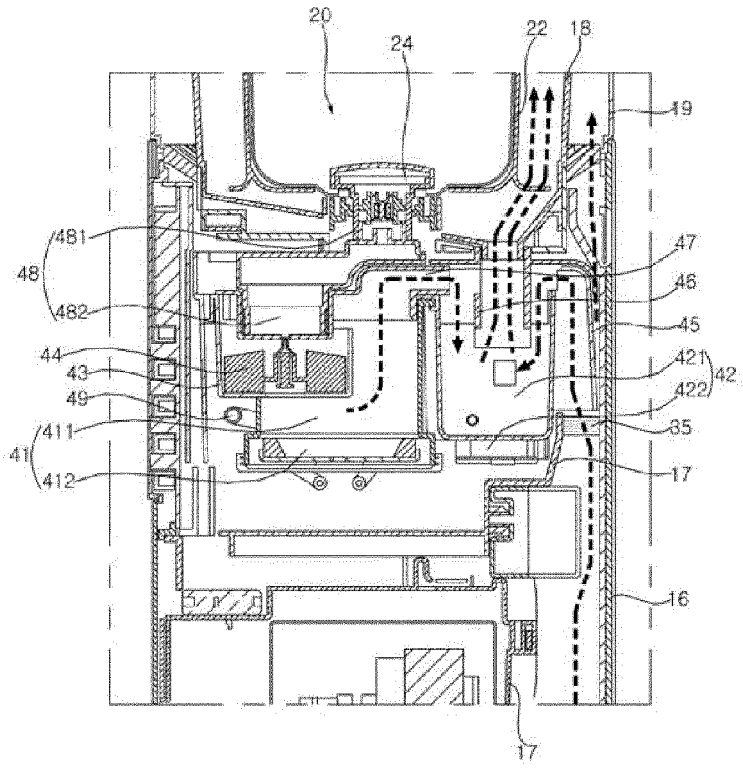
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FIG. 5

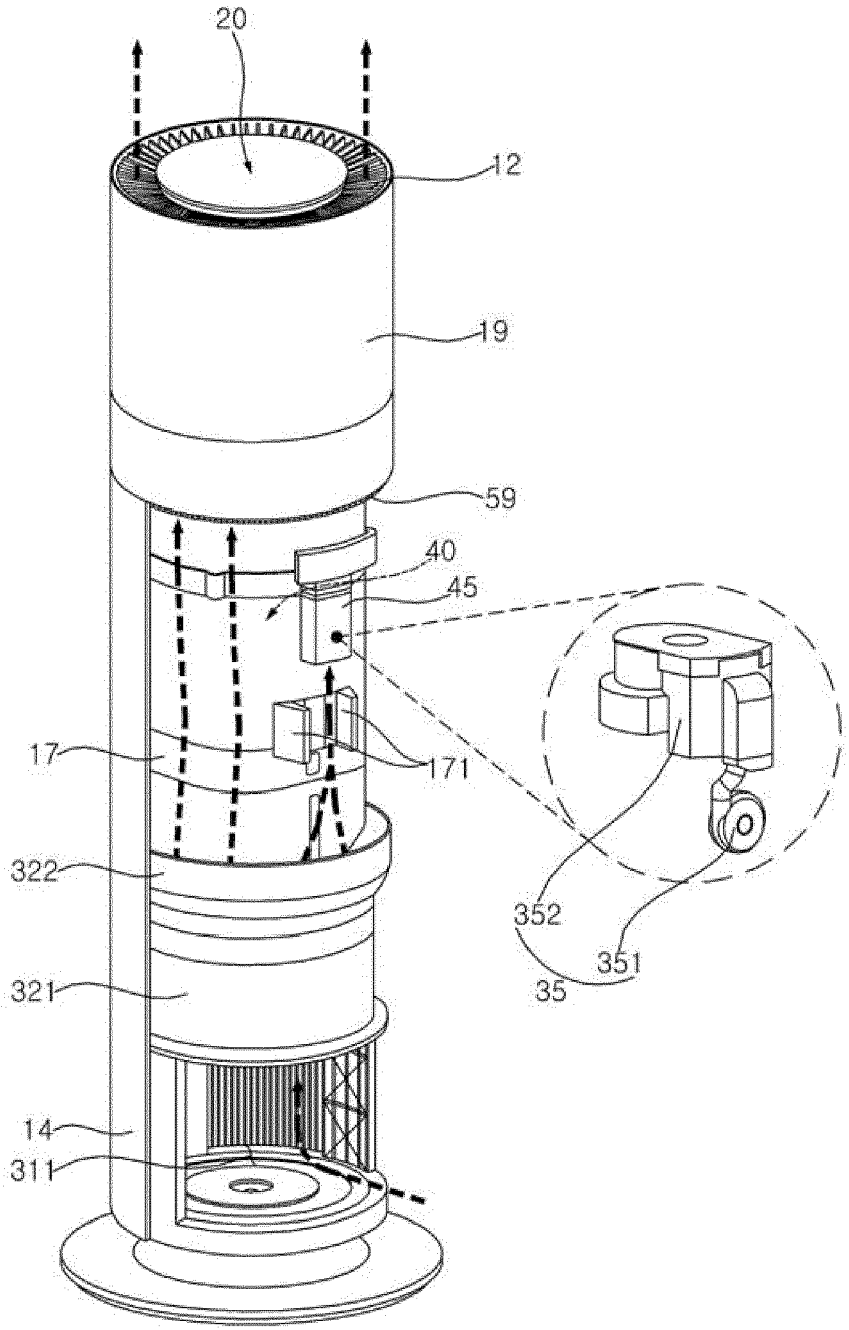

FIG. 6

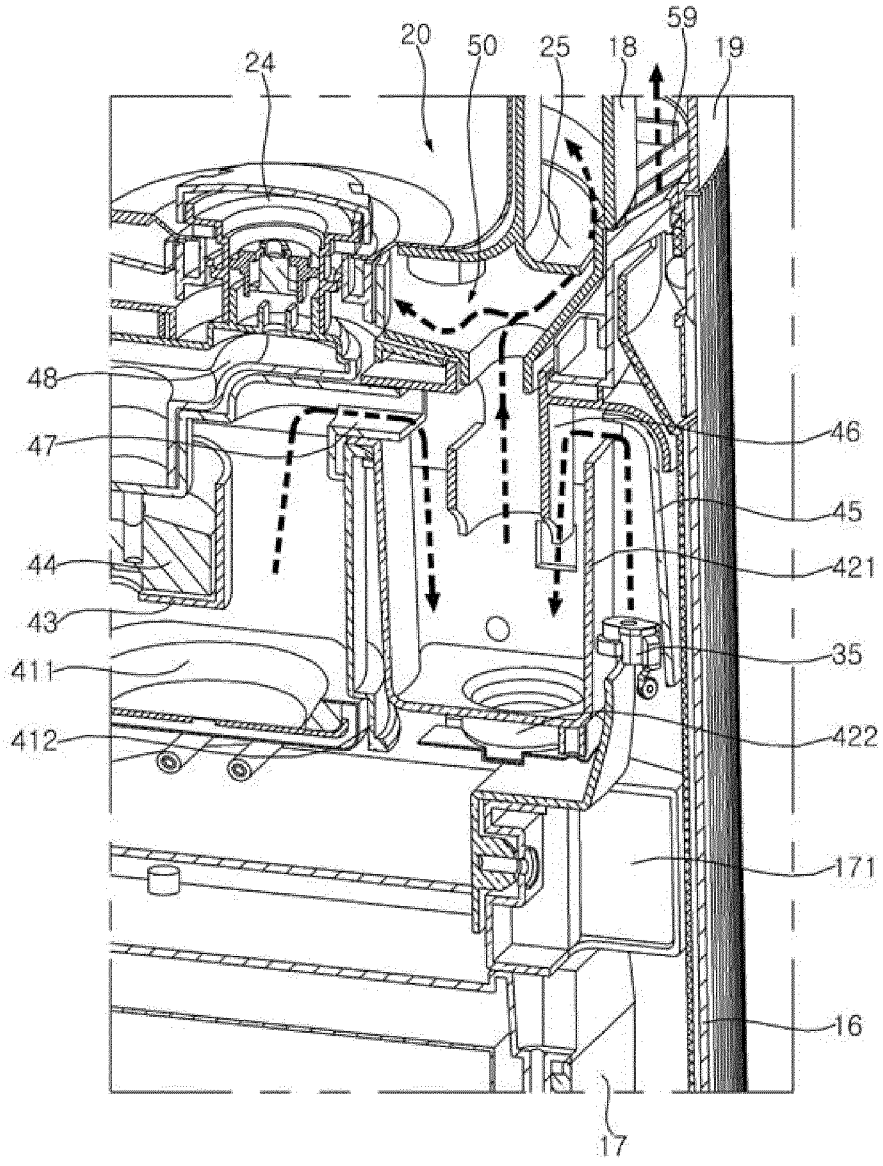

FIG. 7

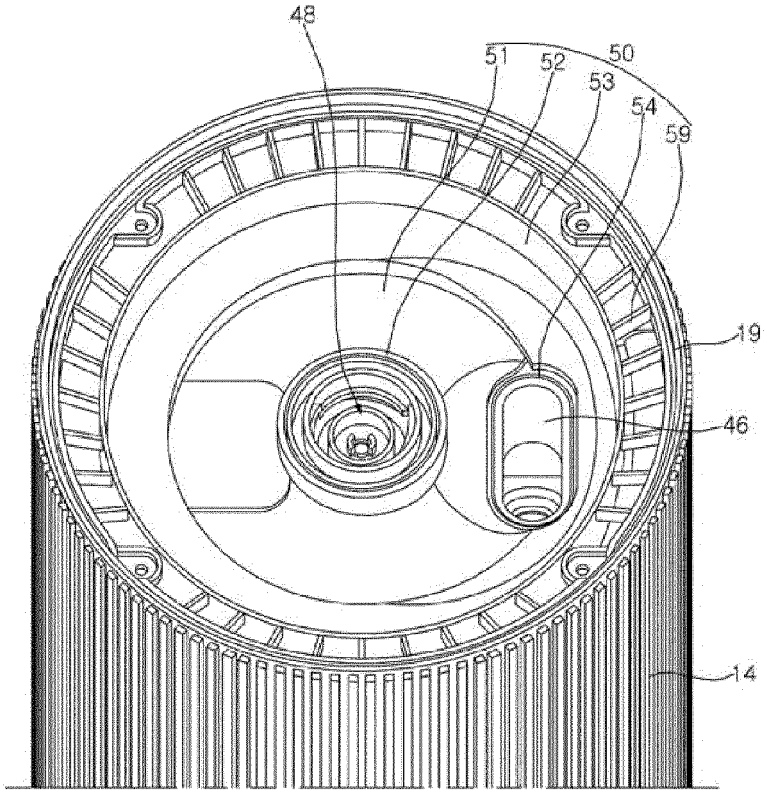
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FIG. 8

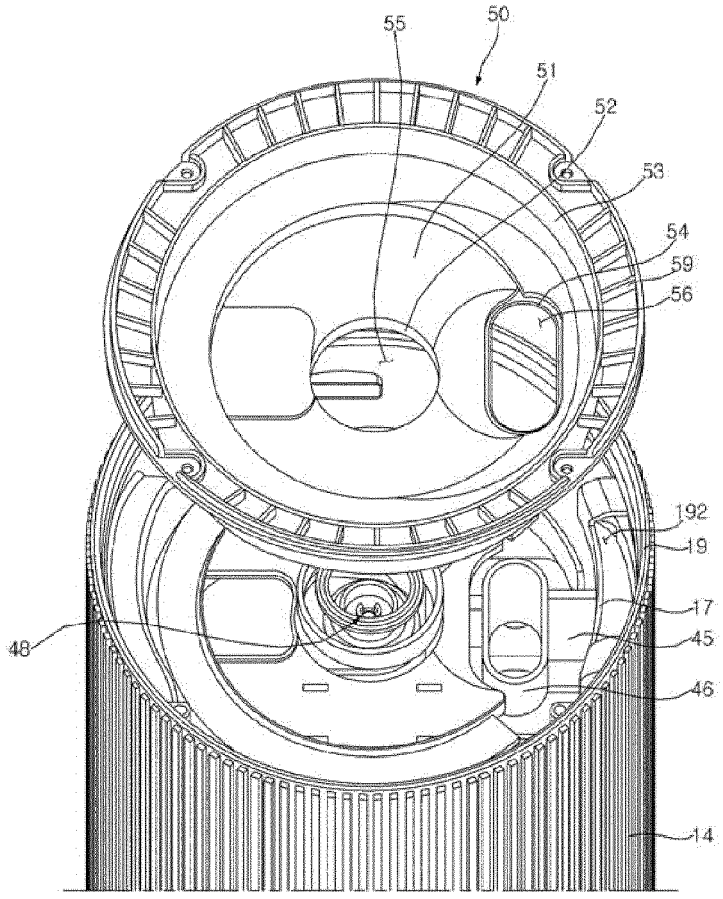
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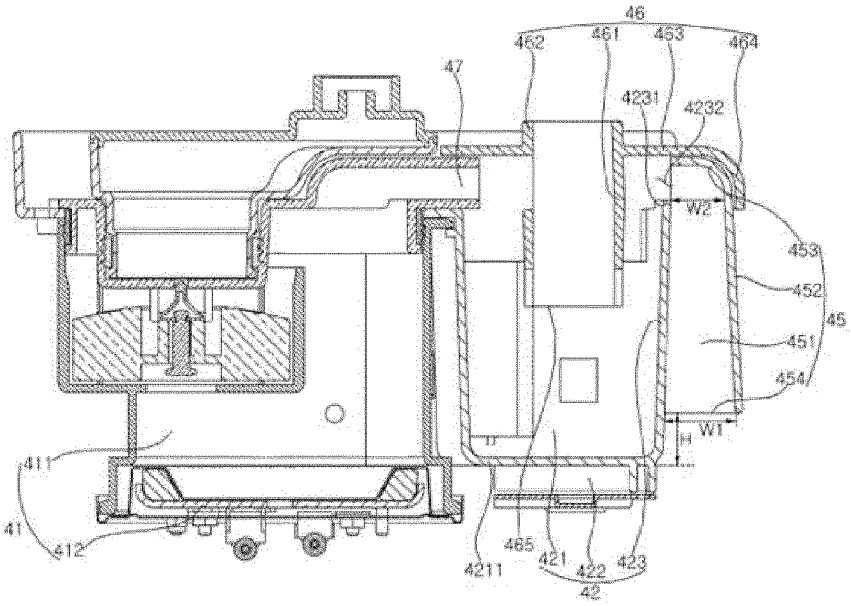
FIG. 9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462
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463
464
47
4231
4232
W2
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451
454
W1
H
411
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421
422
423
4211
42

FIG. 10

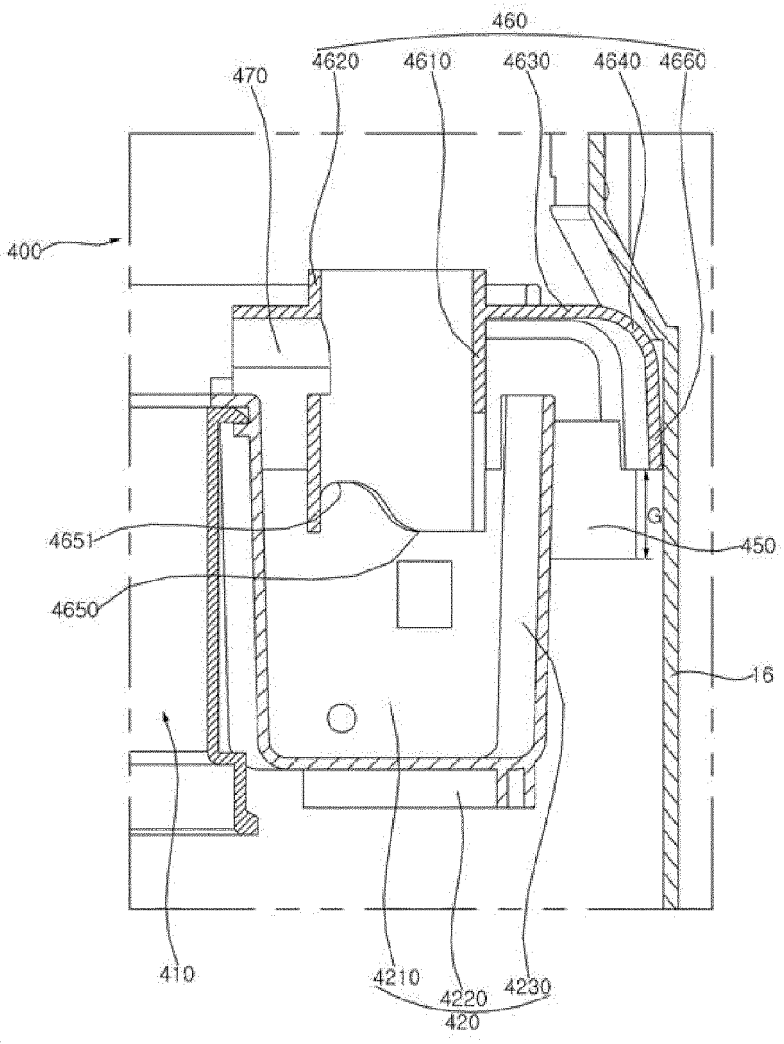
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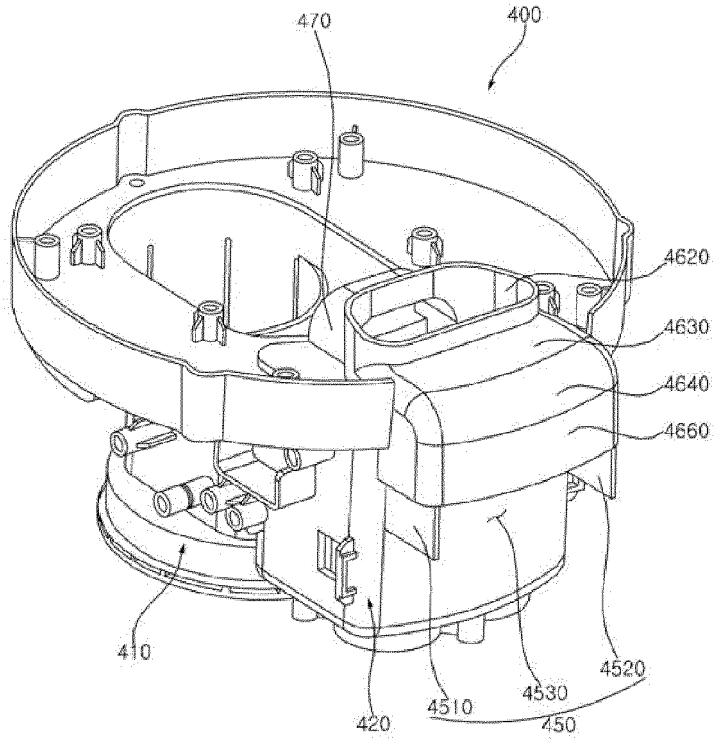
FIG. 11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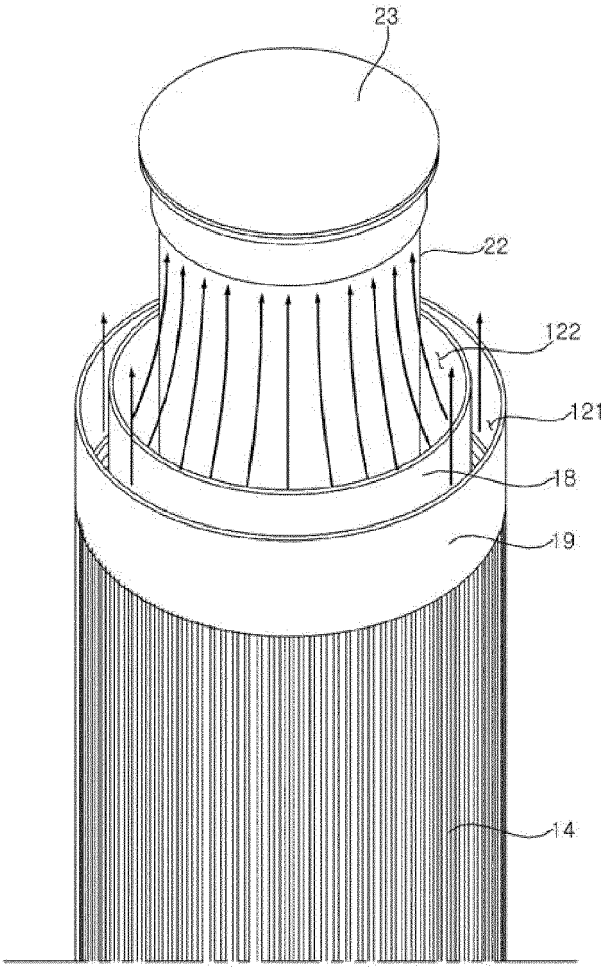
4640
4660
410
420
4510
4530
4520
450

FIG. 12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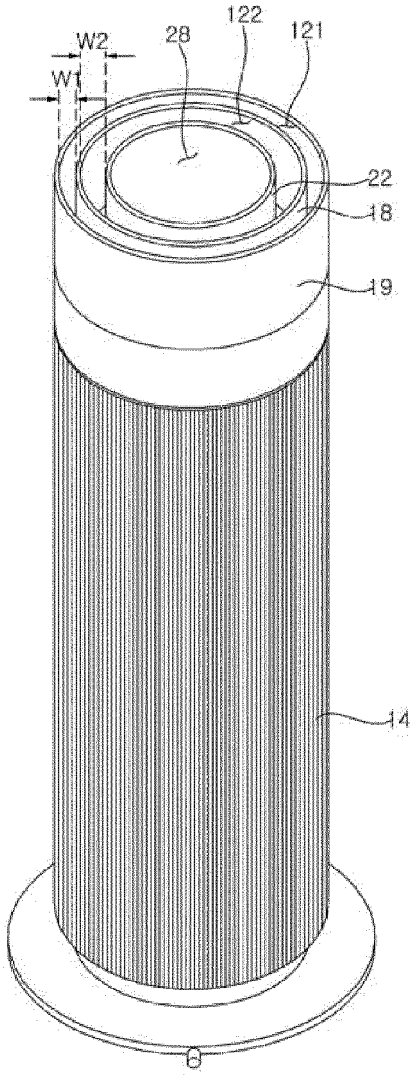
122
121
18
19
14

FIG. 13


W2
W1
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122
121
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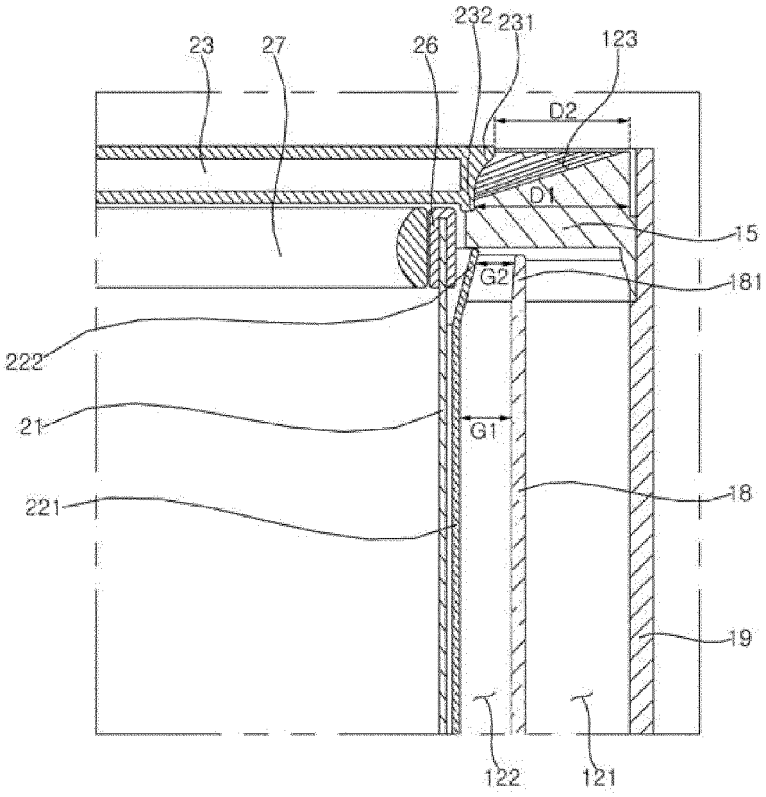
19
14

FIG. 14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231
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D2
D1
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181
G2
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21
G1
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19
122
121

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EUROPEAN SEARCH REPORT

Application Number
EP 23 21 7846

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Place of search	Date of completion of the search	Examiner
Munich	23 April 2024	Mattias Grenbäck

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