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(72) Inventors:
• **Omura, Shingo**
Kadoma-shi
Osaka 571-8686 (JP)
• **Fujiwara, Mitsuru**
Kadoma-shi
Osaka 571-8686 (JP)

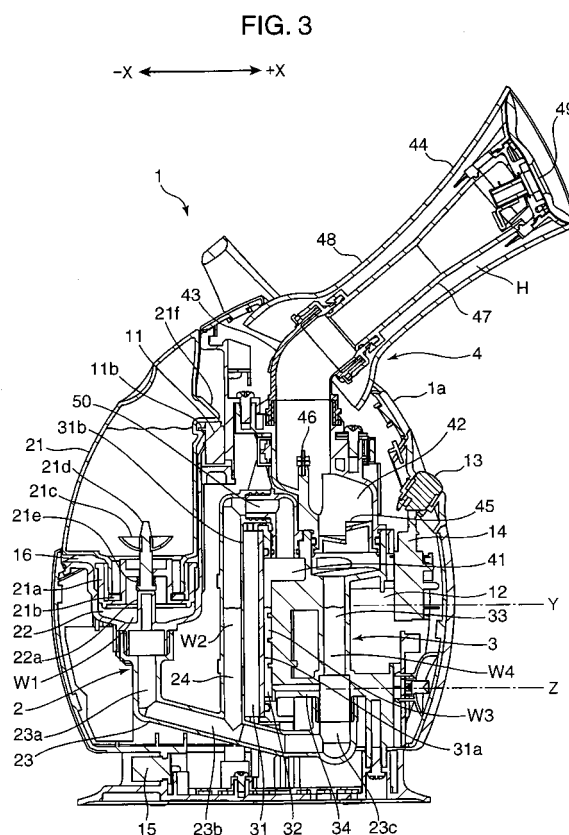
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(71) Applicant: **MATSUSHITA ELECTRIC WORKS, LTD.**
Kadoma-shi, Osaka 571-8686 (JP)

(74) Representative: **Müller-Boré & Partner**
Patentanwälte
Grafinger Strasse 2
81671 München (DE)

(54) **Steam beauty machine**

(57) A steam beauty machine (1) has a preheating mechanism for providing preheated water to a boiling chamber. It is provided with a water supplying mechanism (2), a heater (3) and a steam discharger (4). The water supplying mechanism (2) includes a detachably mounted water tank (21), a water supply storing portion (22), a water supply path portion (23) and a vertically extending preheating path portion (24). The bottom and thereof is coupled to a substantially middle position of a second water supply path (23b) with respect to forward and backward directions. The preheating path portion (24) is also constructed such that the coupled part thereof to the second water supply path (23b) is located relatively in the vicinity of the boiling chamber (32). The heater (31) has a heating surface (31a) arranged along a vertical plane, and a heat radiating surface (31b) located behind the heating surface (31a). The boiling chamber (32) is arranged to face the heating surface (31a) of the heater (31). The preheating path portion (24) is arranged to face the heat radiating surface (31b) of the heater (31).



Description

BACKGROUND OF THE INVENTION

Field of the Invention

[0001] The present invention relates to a steam beauty machine for treating skin surfaces by applying steam to skin.

Description of the Background Art

[0002] There has been conventionally known a steam beauty machine for treating skin surface by applying steam to skin.

[0003] For example, Japanese Unexamined Patent Publication No. 2005-349132 discloses a steam beauty machine constructed such that water supplied from a water tank to a boiling chamber is boiled using heat from a heater opposed to the boiling chamber to generate steam and the generated steam is discharged to the outside from a steam discharge port formed at an upper part of a machine main body.

[0004] Since low-temperature water is supplied from the water tank to the boiling chamber as an amount of water in the boiling chamber decreases by the steam generation in this steam beauty machine, temperature around the boiling chamber suddenly decreases, whereby steam pressure in the machine suddenly decreases. This causes the pulsation of the steam discharged from the steam discharge port.

DISCLOSURE OF THE INVENTION

[0005] In view of the above situation, an object of the present invention is to provide a steam beauty machine capable of stably discharging steam to improve comfort during the use.

[0006] In a steam beauty machine according to the present invention, a preheating mechanism for preheating water to be supplied to a boiling chamber is provided in a water supply path from a water tank to the boiling chamber. According to this steam beauty machine, steam can be more stably discharged from a steam discharge port to improve comfort during the use.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007]

FIG. 1 is a perspective view showing the entire construction of a steam beauty machine according to one embodiment,
FIG. 2 is a front view of the steam beauty machine shown in FIG. 1,
FIG. 3 is a section along III-III of FIG. 2,
FIG. 4 is a section showing a state where a water tank is detached from a machine main body of the

steam beauty machine shown in FIG. 3,

FIG. 5 is a schematic plan view of a heater and a boiling chamber of the steam beauty machine shown in FIG. 3,

FIG. 6 is an enlarged section showing the construction of the steam beauty machine shown in FIG. 3 near a communication hole outlet,

FIG. 7 is a view when viewed in a direction of arrow A of FIG. 6,

FIG. 8 is a section partially showing the construction of a steam beauty machine according to a first modification,

FIG. 9 is a section partially showing the construction of a steam beauty machine according to a second modification,

FIG. 10 is a section showing the construction near a communication hole outlet in a third modification, and

FIG. 11 is a view when viewed in a direction of arrow B of FIG. 10.

BEST MODES FOR EMBODYING THE INVENTION

[0008] Hereinafter, one embodiment of the present invention is described with reference to the accompanying drawings. First, with reference to FIGS. 1 to 4, the entire construction of a steam beauty machine 1 according to one embodiment of the present invention is described. In order to facilitate the description, +X direction and -X direction are referred to as forward direction of the steam beauty machine 1 and backward direction of the steam beauty machine 1 in FIGS. 1 to 4.

[0009] The steam beauty machine 1 of this embodiment is, as shown in FIGS. 1 and 2, constructed such that steam blown out from a later-described nozzle 44 projecting forward from an upper part of a machine main body 1a is applied to user's face, hands, or a like site to treat skin surfaces.

[0010] This steam beauty machine 1 is provided with a water supplying mechanism (water supplier) 2, a heating mechanism (heating unit) 3 and a steam discharging mechanism 4 (steam discharger) as shown in FIGS. 3 and 4.

[0011] The water supplying mechanism 2 includes a water tank 10, a water supply storing portion 22 and a water supply path portion 23.

[0012] The water tank 21 is detachably mounted in a rear upper part of the machine main body 1a at a specified distance from the heating mechanism 3 and is so constructed as to be able to store water to be supplied to the heating mechanism 3. Water of about 25°C to about 30°C is stored in the water tank 21. Water stored in the water tank 21 is not only general water (H₂O), but may also, for example, be aroma water having a healing effect or the like. This water tank 21 is coupled to the water supply storing portion 22 when being mounted in the machine main body 1a.

[0013] The water tank 21 includes a lid 21a, a packing

21b, a conical packing 21c, a water stop pin 21d, and a compression coil spring 21e. The lid 21a is mounted at an opening of the water tank 21 to open and close the water tank 21. The packing 21b is disposed between the opening of the water tank 21 and the lid 21a to hold the water tank 21 watertight when the lid 21a is closed.

[0014] The conical packing 21c is fixed to the water stop pin 21d. The water stop pin 21d is mounted in the lid 21a while being constantly biased in a direction to come out of the water tank 21 by the compression coil spring 21e. Thus, with the water tank 21 detached from the machine main body 1a, the conical packing 21c is pressed against the lid 21a, wherefore the water tank 21 can be securely held watertight.

[0015] The steam beauty machine 1 is further provided with a latch 11 disposed at a specified position of the machine main body 1a and engageable with the water tank 21. Thus, the water tank 21 can be mounted into and detached from the machine main body 1a through a one-touch pushing operation in the steam beauty machine 1.

[0016] Specifically, in the case of mounting the water tank 21, a projection 21f of the water tank 21 pushes a latch button 11a, thereby causing a latch hook 11b to project to retain the water tank 21. On the other hand, in the case of detaching the water tank 21, the projection 21f of the water tank 21 presses the latch button 11a again, thereby causing the latch hook 11b to retract to free the water tank 21. Since this enables the water 21 to be easily mounted into and detached from the machine main body 1a, water leakage from the water tank 21 to the machine main body 1a in the case of detachment can be suppressed.

[0017] The water supply storing portion 22 is disposed adjacent to the bottom part of the water tank 21 mounted in the machine main body 1a. The water supply storing portion 22 has a function of introducing water supplied from the water tank 21 to the water supply path portion 23 while temporarily storing this water. The water supply string portion 22 is disposed at such a height position that the level of water W1 in the water supply storing portion 22, i.e. standard water level during the use of the steam beauty machine 1 substantially coincides with line Y in FIG. 3. In this embodiment, the water W1 in the water supply storing portion 22, water W2 in a preheating path portion 24 and water W4 in a condensate path 33 and water W3 in a boiling chamber 32 are balanced at the line Y.

[0018] The water supply storing portion 22 includes a projecting pin 22a projecting upward. This projecting pin 22a is provided to push the water stop pin 21d inward of the water tank 21, thereby canceling the watertight state of the water tank 21 by the conical packing 21c to permit the supply of the water in the water tank 21 to the water supply storing portion 22, in the case of mounting the water tank 21 into the machine main body 1a.

[0019] The water supply path portion 23 is so connected as to be located below the water supply storing portion

22 and the heating mechanism 3. Specifically, this water supply path portion 23 is comprised of a first water supply path 23a extending vertically downward from the bottom part of the water supply storing portion 22, a second water supply path 23b extending obliquely downward toward the front from the bottom end of the first water supply path 23a and a third water supply path 23c extending vertically upward from the front end of the second water supply path 23b and connected with the heating mechanism 3. These first to third water supply paths 23a, 23b, 23c are constructed, for example, by cylindrical members (e.g. cylindrical pipes).

[0020] Here in this embodiment, the water supplying mechanism 2 further includes the preheating path portion 24 capable of preheating water to be supplied to the heating mechanism 3. This preheating path portion 24 vertically extends and the bottom end thereof is coupled to a substantially middle position of the second water supply path 23b with respect to forward and backward directions. The preheating path portion 24 is also constructed such that the coupled part thereof to the second water supply path 23b is located relatively in the vicinity of the boiling chamber 32. The preheating path portion 24 is constructed, for example, by a cylindrical member (e.g. a cylindrical pipe). In this way, an amount of low-temperature water present in the water supply path portion 23 between the boiling chamber 32 and the above coupled part can be reduced.

[0021] The heating mechanism 3 includes a heater 31 as a heat source, the boiling chamber 32, the condensate path 33, a communication hole 34 and a nonwoven fabric 35 (see FIGS. 6 and 7).

[0022] The heater 31 has a heating surface 31a arranged along a vertical plane, and a heat radiating surface 31b located behind the heating surface 31a. The heater 31 is constructed, for example, by a plate-shaped member, one principal surface thereof serves as the heating surface 31a and the opposite surface to this principal surface serves as the radiating surface 31b. It should be noted that the heater 31 employs a PTC (positive temperature coefficient) element in order to stabilize a heater temperature at a specified saturation temperature (e.g. about 190°C).

[0023] The boiling chamber 32 is arranged to face the heating surface 31a of the heater 31 and constructed to boil (heat and vaporize) the water W3 therein by the heat of the heater 31 to generate steam.

[0024] As shown in FIG. 5, this boiling chamber 32 is in the form of a thin flat plate expanding in a vertical plane so as to have a small water-surface area and a larger contact area with the heating surface 31a of the heater 31. It should be noted that hatching by oblique lines in FIG. 5 shows water supplied to the boiling chamber 32. In this way, a water level drop relative to a reduction in the amount of the water W3 can be made larger while the heating efficiency of the water W3 by the heater 31 is improved. Thus, water can be supplied in a state where the amount of the water W3 is decreased by a relatively

small amount in the steam beauty machine 1 of this embodiment constructed such that water is supplied from the water tank 21 according to the water level drop in the boiling chamber 32. Since this can reduce an amount of water supplied to the boiling chamber 32 each time, a sudden temperature drop around the boiling chamber 32 caused by the water supply can be suppressed. The boiling chamber 32 is, for example, comprised of a first member forming a principal surface, a second member forming a surface opposite to the principal surface, a third and a fourth members forming the opposite side surfaces connecting the first and second members, and a fifth member forming the bottom surface. A space having a thin flat plate shape is formed by these first to fifth members, and the first member serves as the heater 31.

[0025] In this embodiment, the aforementioned preheating path portion 24 is arranged to face the heat radiating surface 31b of the heater 31 while being held in contact therewith substantially over the entire length of its path, so that the water W2 in the preheating path portion 24 can be heated utilizing the remaining heat of the heater 31. The preheating path portion 24 and the heat radiating surface 31b correspond to one example of a "preheating mechanism (preheater)". In the steam beauty machine 1 of this embodiment, the water W2 in the preheating path portion 24 can be heated without being boiled by adjusting the heating ability of the heater 31 or disposing an interfering member between the preheating path portion 24 and the heat radiating surface 31b, and the temperature of the water W2 is constantly about 80°C to about 90°C. Parameters of the preheating path portion 24 and the second water supply path 23b such as the sections of flow channels are set such that the temperature of mixed water obtained by mixing the water W2 in the preheating path portion 24 and the water in the second water supply path 23b at the time of the water supply from the water tank 21 has a temperature of about 60°C to about 70°C.

[0026] The condensate path 33 is connected to the upper end of the third water supply path 23c and the steam discharging mechanism 4 and is provided to return condensed water produced in the steam discharging mechanism 4 and flowing down due to its own weight to the third water supply path 23c for reutilization. In this way, steaming efficiency (ratio of an amount of generated steam to a water supply amount) is improved. The condensate path 33 is constructed, for example, by a cylindrical member (e.g. cylindrical tube). It should be noted that the water W4 in the condensate path 33 has a relatively high temperature by being constantly held in contact with high-temperature steam filling the steam discharging mechanism 4.

[0027] The communication hole 34 is disposed to connect the third water supply path 23c and the boiling chamber 32 and is constructed, for example, a cylindrical member (e.g. a cylindrical pipe) having one end communicating with the third water supply path 23c and the other end communicating with the boiling chamber 32. This com-

munication hole 34 is formed to have a smaller section relative to the length thereof (for example, diameter is about 2.5 mm and length is about 18.0 mm), thereby restricting an amount of water supply from the third water supply path 23c to the boiling chamber 32. Therefore, an amount of water suitable for the heating ability of the heater 31 can be supplied to the boiling chamber 32.

[0028] As shown in FIGS. 6 and 7, the communication hole 34 includes a vertical groove 34a extending vertically downward at an end toward the boiling chamber 32. This vertical groove 34a is formed such that the width thereof substantially coincides with the diameter (about 2.5 mm) of the communication hole 34 and depth "d" thereof is about 1.25 mm. In this way, a force to pull the water in the communication hole 34 toward the boiling chamber 32 acts by the capillary action, wherefore the stagnation of water in the communication hole 34 can be prevented.

[0029] The nonwoven fabric 35 has an excellent water absorbing property and is laid over the entire inner bottom surface of the boiling chamber 32 with a part thereof held in contact with the heater 31 as shown in FIG. 6. Thus, condensed water in the steam discharging mechanism 4, for example, having run down along a wall surface 32a of the boiling chamber 32 after the use of the steam beauty machine 1 is held in contact with the heater 31 while being absorbed in the nonwoven fabric 35, thereby gradually evaporating in the contact part of the nonwoven fabric 35 with the heater 31. Therefore, a sudden increase of the steam pressure resulting from the direct contact of the condensed water with the heater 31 can be suppressed.

[0030] Since the nonwoven fabric 35 is constantly heated by the heater 31, water absorption saturation is unlikely to occur and a state capable of water absorption can be easily maintained. A saturated water absorption amount of such a nonwoven fabric 35 is preferably set equal to or more than a total amount of condensed water having a possibility of flowing down to come into contact with the heater 31.

[0031] The steam discharging mechanism 4 includes a steam generator 41, a steam path portion 42, a bent elastic member 43 and the nozzle 44.

[0032] The steam generator 41 is continuous with the upper part of the boiling chamber 32 and is so constructed as to temporarily store steam obtained by boiling the water W3 in the boiling chamber 32. This steam generator 41 is coupled to the steam path portion 42 via an unillustrated coupling path.

[0033] In this embodiment, the upper part of the aforementioned preheating path portion 24 is coupled to the steam generator 41 via an elbow 50. The elbow 50 is constructed, for example, a cylindrical member having one end communicating with the upper part of the preheating path portion 24, being bent vertically downward after horizontally extending and having the other end communicating with the steam generator 41. It should be noted that the steam generator 41 is one example of a

"steam path". By connecting the upper part of the preheating path portion 24 with the steam generator 41 which is a generating source of the steam pressure and in which pressure variation caused, for example, by steam condensation or the like is relatively unlikely to occur, inner pressures in the preheating path portion 24 and the steam discharging mechanism 4 can be easily balanced. Further, the water W2 in the preheating path portion 24 has a relatively high temperature by being constantly held in contact with high-temperature steam filling the steam discharging mechanism 4.

[0034] Such a steam generator 41 is, for example, a bottomed tubular member having a short height, fitted with a lid and having a rectangular section, wherein a slit-shaped first opening is formed in a part of the bottom surface of the steam generator 41, and a second and a third openings are formed in parts of the upper surface. The steam generator 41 communicates with the boiling chamber 32 through the first opening, with the coupling path through the second opening and with the elbow 50 through the third opening.

[0035] The steam path portion 42 is connected to the nozzle 44 via the bent elastic member 43, and includes a sudden boiling preventing wall 45 having different levels and a high-pressure discharger 46 for making steam microfine. The bent elastic member 43 is constructed to function as a pivot of turning movements (upward and downward movements) of the nozzle 44. The bent elastic member 43 is constructed, for example, a cylindrical member made of elastic material.

[0036] The nozzle 44 has a double-wall structure comprised of a nozzle inner tube 47 connected to the bent elastic member 43 and a nozzle outer tube 48 coaxial with the nozzle inner tube 47. The steam discharge port 49 is provided at the leading end of the nozzle inner tube 47. The steam discharge port 49 is, for example, a round hole which is formed in a lid member provided at the leading ends of the nozzle inner tube 47 and the nozzle outer tube 48 and into which the nozzle tubes are inserted. This steam discharge port 49 extends in a direction away from the machine main body 1a. With such a construction, the steam discharge port 49 can be brought closer to a treatment part of a user, wherefore the aimed treatment part can be steamed and the user needs not to move toward the machine main body 1a. As a result, the user can use the steam beauty machine 1 in a comfortable posture. By constructing the nozzle 44 to be expandable and contractible and movable in a wide range, a steam dischargeable area widens, wherefore usability can be further improved.

[0037] A heat insulating material H such as foam rubber having a thickness of about 5.0 mm is, for example, disposed between the nozzle inner tube 47 and the nozzle outer tube 48 to improve the heat insulating effect of the nozzle 44. An air layer may be provided instead of the heat insulating material H or a layered structure of the heat insulating material H and an air layer may be provided. In the latter case, the heat insulating effect of

the nozzle 44 can be further improved.

[0038] The steam beauty machine 1 includes a control circuit 12 for controlling the operation of the steam beauty machine 1 in a front part of the machine main body 1a. The control circuit 12 is electrically connected with the heater 31 of the heating mechanism 3, a changeover switch 14 coupling to a power button 13 for turning on and off the steam beauty machine 1, the high-pressure discharger 46 of the steam discharging mechanism 4 and a power supply cord 15 for power supply.

[0039] The steam beauty machine 1 also includes a drain port 16 provided at the rear side of the machine main body 1a. This drain port 16 is exposed to the outside by detaching the water tank 21 from the machine main body 1a. Specifically, water remaining in the machine main body 1a can be drained through the drain port 16 by inclining the machine main body 1a to locate the water supply storing portion 22 at the bottom with the water tank 21 detached from the machine main body 1a after the use of the steam beauty machine 1.

[0040] The drain port 16 is located above the line Y as the standard water level during the use of the steam beauty machine 1 (see FIG. 3) and below a specified height position where sudden boiling is likely to occur by the water W3 in the boiling chamber 32. Thus, even if water is supplied, for example, using water supply means other than the water tank 21 for exclusive use, the water supplied beyond the specified water level is drained to the outside of the machine main body 1a through the drain port 16, therefore preventing an occurrence of an inconvenient situation where hot water drops jump out from the steam discharge port 49 resulting from superfluous water supply into the machine main body 1a. Further, since an angle of inclination of the machine main body 1a at which drainage is possible can be made smaller by arranging the drain port 16 right above the line Y as the standard water level during the use, the steam beauty machine 1 can be more easily handled for drainage.

[0041] The steam beauty machine 1 further includes a temperature indicating member 17 disposed at a side of the machine main body 1a as shown in FIG. 1. This temperature indicating member 17 is adhered to the machine main body 1a by a two-sided adhesive tape and changes its color, for example, at about 40°C. Specifically, the color of the temperature indicating member 17 changes, for example, from blue to pink if the temperature of the portion of the machine main body 1a where the temperature indicating member 17 is adhered exceeds 40°C, and changes to blue again if the temperature of this portion falls to or below 40°C. It should be noted that the temperature indicating member 17 is preferably adhered to a specified portion of the machine main body 1a having a relation with the temperature of the heater 31.

[0042] With this construction, the color of the temperature indicating member 17 is pink if the machine main body 1a is at a high temperature after the use of the steam beauty machine 1, wherefore the user can secure-

ly and easily confirm by eye that the machine main body 1a is in a high-temperature state. As a result, unexpected sudden boiling and the like can be prevented to improve safety.

[0043] Next, how to use the steam beauty machine 1 of this embodiment is described.

[0044] First, a specified amount of water is poured into the water tank 21 detached from the machine main body 1a and the water tank 21 is closed with the lid. The water tank 21 is coupled to the water supply storing portion 22 by being mounted into the machine main body 1a. In this case, the water stop pin 21d is pushed into the water tank 21 by the projecting pin 22a of the water supply storing portion 22 to cancel watertightness of the conical packing 21c, whereby water in the water tank 21 is supplied to the water supply storing portion 22.

[0045] The water supplied to the water supply storing portion 22 is supplied to the preheating path portion 24, the boiling chamber 32 and the condensate path 33 via the water supply path portion 23. Here, the water is supplied to the boiling chamber 32 via the communication hole 34. It should be noted that the water W1 in the water supply storing portion 22, the water W2 in the preheating path portion 24, the water W4 in the condensate path 33 and the water W3 in the boiling chamber 32 are balanced at the line Y in FIG. 3.

[0046] Next, the power button 13 is pushed to turn the changeover switch 14 on, whereby power is supplied to the heater 31 and the high-pressure discharger 46. Steam generated from the water W3 in the boiling chamber 32 boiled by the heat of the heater 31 is made micro-fine by the high-pressure discharger 46 upon passing the steam path portion 42 via the steam generator 41 disposed above the boiling chamber 32. Then, the steam is discharged to the outside of the machine main body 1a from the steam discharge port 49 through the nozzle 44.

[0047] Thereafter, the water W3 in the boiling chamber 32 gradually decreases as being changed into steam, and the level thereof drops together with those of the water W2 in the preheating path portion 24 and the water W4 in the condensate path 33. However, the steam pressure of the steam discharging mechanism 4 is applied to the surfaces of the water W2, the water W3 and the water W4, whereby there is a water level difference between the water W1 in the water supply storing portion 22 exposed to atmospheric pressure and the waters W2 to W4. If the level of the water W1 falls below the line Y in this state, air enters the water tank 21 and a proper amount of the water in the water tank 21 is supplied to the water supply storing portion 22.

[0048] At this time, the water supplied from the water tank 21 flows toward the boiling chamber 32 via the water supply path portion 23. However, since this water supplied from the water tank 21 is mixed with the water W2 in the preheating path portion 24 heated by the heat radiating surface 31b of the heater 31 in the second water supply path 23b, it is supplied to the boiling chamber 32 while having the temperature thereof increased. In this

way, a sudden temperature drop around the boiling chamber 32 caused by the water supply can be suppressed, wherefore a sudden drop in the steam pressure of the steam discharging mechanism 4 caused by the water supply can also be suppressed.

[0049] The levels of the waters W1 to W4 come to be balanced at a line Z in FIG. 3 located at the bottommost point of the communication hole 34, whereby the conversion of the water W3 in the boiling chamber 32 into steam is stopped and no more steam is discharged from the steam discharge port 49.

[0050] After the use of the steam beauty machine 1, the water tank 21 is detached from the machine main body 1a and the machine main body 1a is inclined to locate the water supply storing portion 22 at the bottom to drain the remaining water in the machine main body 1a through the drain port 16.

[0051] In this embodiment, since the temperature of the water supplied from the water tank 21 to the boiling chamber 32 as the water amount in the boiling chamber 32 decreases can be increased by providing the preheating path portion 24 for preheating the water supplied from the water tank 21 to the boiling chamber 32 as described above, a sudden drop in temperature around the boiling chamber 32 caused by the water supply can be suppressed. This can suppress a sudden drop in the steam pressure of the steam generator 41 at the time of the water supply, wherefore the pulsation of the steam discharged from the steam discharge port 49 resulting from a large decrease in an amount of steam discharged from the steam discharge port 49 every time water is supplied can be suppressed. Since the steam can be thus constantly stably discharged from the steam discharge port 49 in this embodiment, comfort during the use can be sufficiently improved.

[0052] Further, in this embodiment, no additional heater needs to be provided to preheat the water supplied from the water tank 21 to the boiling chamber 32 by providing the preheating path portion 24 for heating the water utilizing the remaining heat of the heater 31 as described above. Therefore, an increase in the number of parts and the enlargement of the machine main body 1a can be suppressed.

[0053] Furthermore, in this embodiment, the water having a relatively high temperature in the preheating path portion 24 can be mixed with the water having a relatively low temperature in the second water supply path 23b at the time of the water supply from the water tank 21 by coupling the preheating path portion 24 opposed to the heater 31 to the second water supply path 23b as described above. Therefore, the temperature of the water supplied from the water tank 21 to the boiling chamber 32 as the water amount in the boiling chamber 32 decreases can be increased.

[0054] Further, in this embodiment, the water can be heated utilizing only the remaining heat of the heater 31 without reducing the heating efficiency of the heater 31 for the boiling chamber 32 by arranging the preheating

path portion 24 to face the heat radiating surface 31b of the heater 31 as described above.

[0055] Further, in this embodiment, the preheating path portion 24 can be prevented from becoming a closed path by coupling the upper part of the preheating path portion 24 to the steam generator 41 as described above. Thus, water can easily enter and exit the preheating path portion 24. Since this enables the water having a relatively high temperature in the preheating path portion 24 to be mixed with the water having a relatively low temperature in the second water supply path 23b at the time of the water supply from the water tank 21, the temperature of the water to be supplied to the boiling chamber 32 can be easily increased. Further, the water in the preheating path portion 24 can be brought into contact with the high-temperature steam since the upper part of the preheating path portion 24 can be filled with steam. Since the water in the preheating path portion 24 can also be heated by the steam in this way, the heating efficiency of the preheating path portion 24 can be improved.

[0056] Furthermore, in this embodiment, the safety of the steam beauty machine 1 can be improved since an occurrence of sudden boiling in the preheating path portion 24 can be suppressed by providing the preheating path portion 24 constructed to heat water without boiling it as described above.

[0057] Further, in this embodiment, operability in pouring water into and out of the water tank 21 can be improved since water can be poured into and out of the water tank 21 detached from the machine main body 1a by constructing water tank 21 mountable into and detachable from the machine main body 1a. In addition, since a temperature increase of the water tank 21 by the remaining heat from the heater 31 can be suppressed by arranging the water tank 21 at a position distant from the heater 31, safety in pouring water into and out of the water tank 21 can be improved.

[0058] Furthermore, in this embodiment, a temperature increase of the water W1 can be suppressed since the water W1 in the water supply storing portion 22 is unlikely to be influenced by the temperature of the water W2 in the preheating path portion 24 by connecting the bottom end of the preheating path portion 24 to the second water supply path 23b as described above. Therefore, safety can be improved.

[0059] Further, in this embodiment, the reverse flow of the steam from the heating mechanism 3 can be prevented during the use since water is constantly present in the water supply path portion 23 by arranging the water supply path portion 23 below the boiling chamber 32 as described above.

[0060] Although the preheating mechanism constructed such that the preheating path portion 24 having the bottom end thereof coupled to the second water supply path 23b is arranged to face the heat radiating surface 31b of the heater 31 is described as an example in the foregoing embodiment, the present invention is not limited thereto. A preheating mechanism according to a first

modification comprised of a preheating path portion 124 having the upper end thereof coupled to the second water supply path 23b, a preliminary boiling chamber 132 disposed at the bottom end of the preheating path portion 124 and a preheater 131 arranged to face the preliminary boiling chamber 132 may be provided as shown in FIG. 8. In the preheating mechanism according to this first modification, the preliminary boiling chamber 132 is, for example, a bottomed tubular member having a short height and fitted with a lid, a member constructing the bottom surface thereof serves as the preheater 131, an opening is formed in a part of the upper surface thereof, and the preheating path portion 124 in the form of a cylindrical pipe communicates with the preliminary boiling chamber 132 through this opening. The preheating mechanism according to this first modification can also obtain substantially the same effects as the foregoing embodiment.

[0061] Further, as shown in FIG. 9, a preheating mechanism according to a second modification may be provided in which a heater 231 is arranged to horizontally place a heating surface 231a, a boiling chamber 232 is defined above the heating surface 231a, and the third water supply path 23c is connected to a communication hole 234 vertically penetrating the heater 231 to supply water from the water supply storing portion 22 to the boiling chamber 232. The boiling chamber 232 according to this second modification is, for example, a bottomed tubular member fitted with a lid, a member constructing the bottom surface thereof serves as the heater 231, a first and a second openings respectively communicating with the coupling path and the elbow 50 are formed in parts of the upper surface thereof, and the cylindrical communication hole 234 is formed in the heater 231. The preheating mechanism according to this second modification can also obtain substantially the same effects as the foregoing embodiment.

[0062] Although the vertical groove 34a is formed to vertically extend downward at the end of the communication hole 34 toward the boiling chamber 32 in the foregoing embodiment, the present invention is not limited thereto. As shown in a third modification of FIGS. 10 and 11, a water guiding member 34b (e.g. a metal chain) hanging down through the outlet of the communication hole 34 may be provided in the vicinity of the end of the communication hole 34 toward the boiling chamber 32. Such a construction can also obtain substantially the same effects as the foregoing embodiment.

[0063] Further, although the preheating path portion 24 is arranged in contact with the heat radiating surface 31b of the heater 31 in the foregoing embodiment, the present invention is not limited thereto and the preheating path portion 24 may be arranged in contact with the heating surface 31a of the heater 31. In this case, a reduction in the amount of steam generation is preferably prevented by enlarging a heater area by as much as to heat the preheating path portion 24.

[0064] Although the upper part of the preheating path

portion 24 is coupled to the steam generator 41 via the elbow 50 in the foregoing embodiment, the present invention is not limited thereto and the upper part of the preheating path portion 24 may be, for example, coupled to the vicinity of the bottom part of the sudden boiling preventing wall 45 of the steam path portion 42.

[0065] Although being applied to the steam beauty machine 1 including the water tank 21 detachably mountable into the machine main body 1a in the foregoing embodiment, the present invention is not limited thereto and is also applicable to steam beauty machines having water tanks integral to machine main body.

[0066] This specification discloses various inventions as described above, out of which main inventions are summarized as follows.

[0067] A steam beauty machine for treating skin surfaces by applying steam to skin according to a first mode comprises a water tank capable of storing water; a boiling chamber in which water supplied from the water tank is boiled using the heat of a heater to generate steam; a steam discharge port for discharging the steam generated in the boiling chamber to the outside of a machine main body; and a preheating mechanism disposed in a water supply path extending from the water tank to the boiling chamber for preheating the water to be supplied to the boiling chamber.

[0068] With this construction, a sudden temperature drop around the boiling chamber caused by the water supply can be suppressed since the temperature of the water to be supplied from the water tank to the boiling chamber as a water amount in the boiling chamber decreases can be increased by disposing the preheating mechanism for preheating the water to be supplied from the water tank to the boiling chamber. Thus, a sudden drop in the steam pressure in the machine at the time of the water supply can be suppressed, wherefore the pulsation of the steam discharged from the steam discharge port resulting from a large decrease in an amount of steam discharged from the steam discharge port every time water is supplied can be suppressed. Since the steam can be thus stably discharged from the steam discharge port, comfort during the use can be more improved.

[0069] A steam beauty machine according to a second mode is such that the preheating mechanism heats water utilizing the remaining heat of the heater in the steam beauty machine according to the first mode. With this construction, an increase in the number of parts and the enlargement of the machine main body can be suppressed.

[0070] A steam beauty machine according to a third mode is such that the heater has a heating surface arranged along a substantially vertical plane; the boiling chamber is arranged to face the heating surface; the water supply path includes a first water supply path extending substantially vertically to be connected to a bottom part of the water tank, a second water supply path extending substantially horizontally from the bottom end of

the first water supply path and a third water supply path extending substantially vertically upward from an end of the second water supply path to be connected to the boiling chamber; and the preheating mechanism includes a preheating path extending substantially vertically, having a bottom part thereof coupled to the second water supply path, and the preheating path being arranged to face a heat radiating surface of the heater at a side opposite to the heating surface in the steam beauty machine according to the first or second mode. With this construction, the temperature of the water to be supplied from the water tank to the boiling chamber can be increased utilizing only the remaining heat of the heater.

[0071] A steam beauty machine according to a fourth mode is such that an upper part of the preheating path is coupled to a steam path downstream with respect to the boiling chamber in a steam flow direction in the steam beauty machine according to the third mode. With this construction, the temperature of the water to be supplied to the boiling chamber can be easily increased while the heating efficiency of the preheating path is improved.

[0072] A steam beauty machine according to a fifth mode is such that the preheating mechanism heats water without boiling it in the steam beauty machine according to any one of the first to fourth modes. With this construction, an occurrence of sudden boiling in the preheating mechanism can be suppressed to improve safety.

[0073] A steam beauty machine according to a sixth mode is such that the water tank is detachably mountable into the machine main body in the steam beauty machine according to any one of the first to fifth modes. With this construction, operability in pouring water into and out of the water tank can be improved.

[0074] While the invention is properly and sufficiently described by way of the embodiment with reference to the drawings, it should be understood that a person skilled in the art can easily modify and improve the described embodiment. It is therefore to be understood that such modifications or improvements are embraced by the spirit and scope as set out in the appended claims unless departing from the spirit and scope of the appended claims.

Claims

1. A steam beauty machine for treating skin surfaces by applying steam to skin according to a first mode, comprising:

a water tank capable of storing water;
a boiling chamber in which water supplied from the water tank is boiled using the heat of a heater to generate steam;
a steam discharge port for discharging the steam generated in the boiling chamber to the outside of a machine main body; and
a preheating mechanism disposed in a water

supply path extending from the water tank to the boiling chamber for preheating the water to be supplied to the boiling chamber.

2. A steam beauty machine according to claim 1, wherein the preheating mechanism heats water utilizing the remaining heat of the heater. 5

3. A steam beauty machine according to claim 1 or 2, wherein: 10

the heater has a heating surface arranged along a substantially vertical plane;
the boiling chamber is arranged to face the heating surface; 15
the water supply path includes a first water supply path extending substantially vertically to be connected to a bottom part of the water tank, a second water supply path extending substantially horizontally from the bottom end of the first 20
water supply path and a third water supply path extending substantially vertically upward from an end of the second water supply path to be connected to the boiling chamber; and
the preheating mechanism includes a preheating path extending substantially vertically, having a bottom part thereof coupled to the second 25
water supply path, and the preheating path being arranged to face a heat radiating surface of the heater at a side opposite to the heating surface. 30

4. A steam beauty machine according to claim 3, wherein an upper part of the preheating path is coupled to a steam path downstream with respect to the boiling chamber in a steam flow direction. 35

5. A steam beauty machine according to any one of claims 1 to 4, wherein the preheating mechanism heats water without boiling it. 40

6. A steam beauty machine according to any one of claims 1 to 5, wherein the water tank is detachably mountable into the machine main body. 45

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FIG. 1

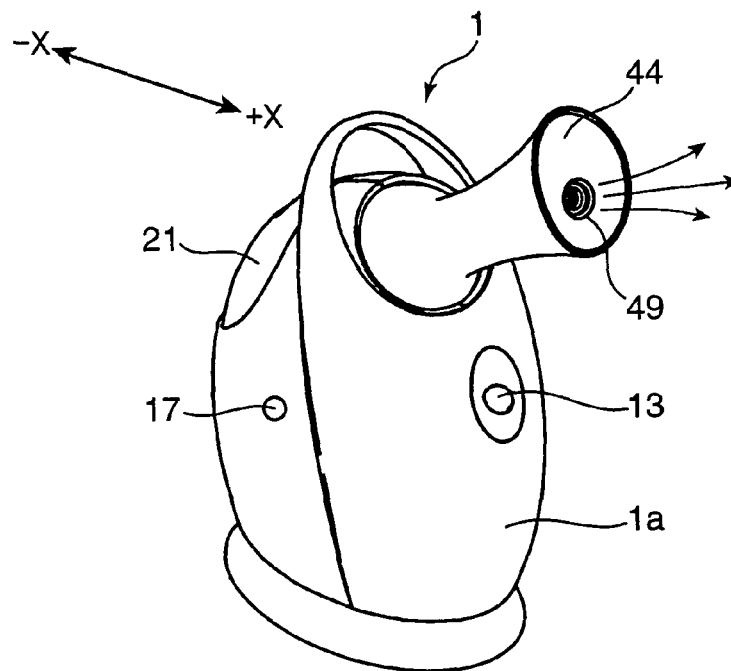


FIG. 2

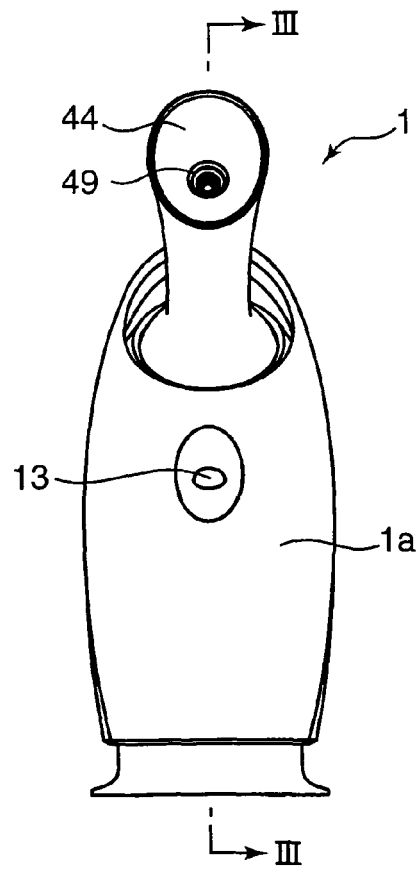


FIG. 3

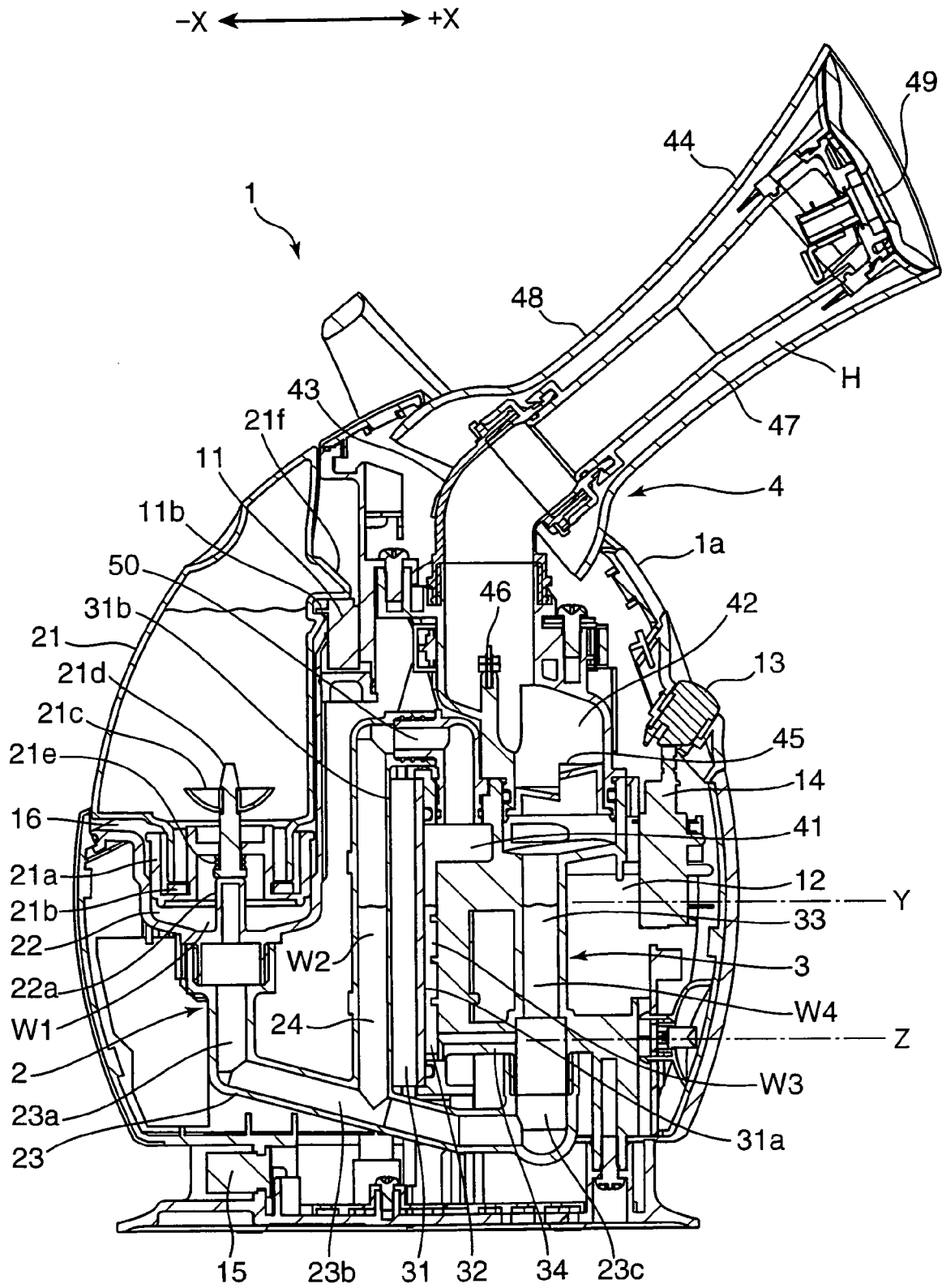


FIG. 4

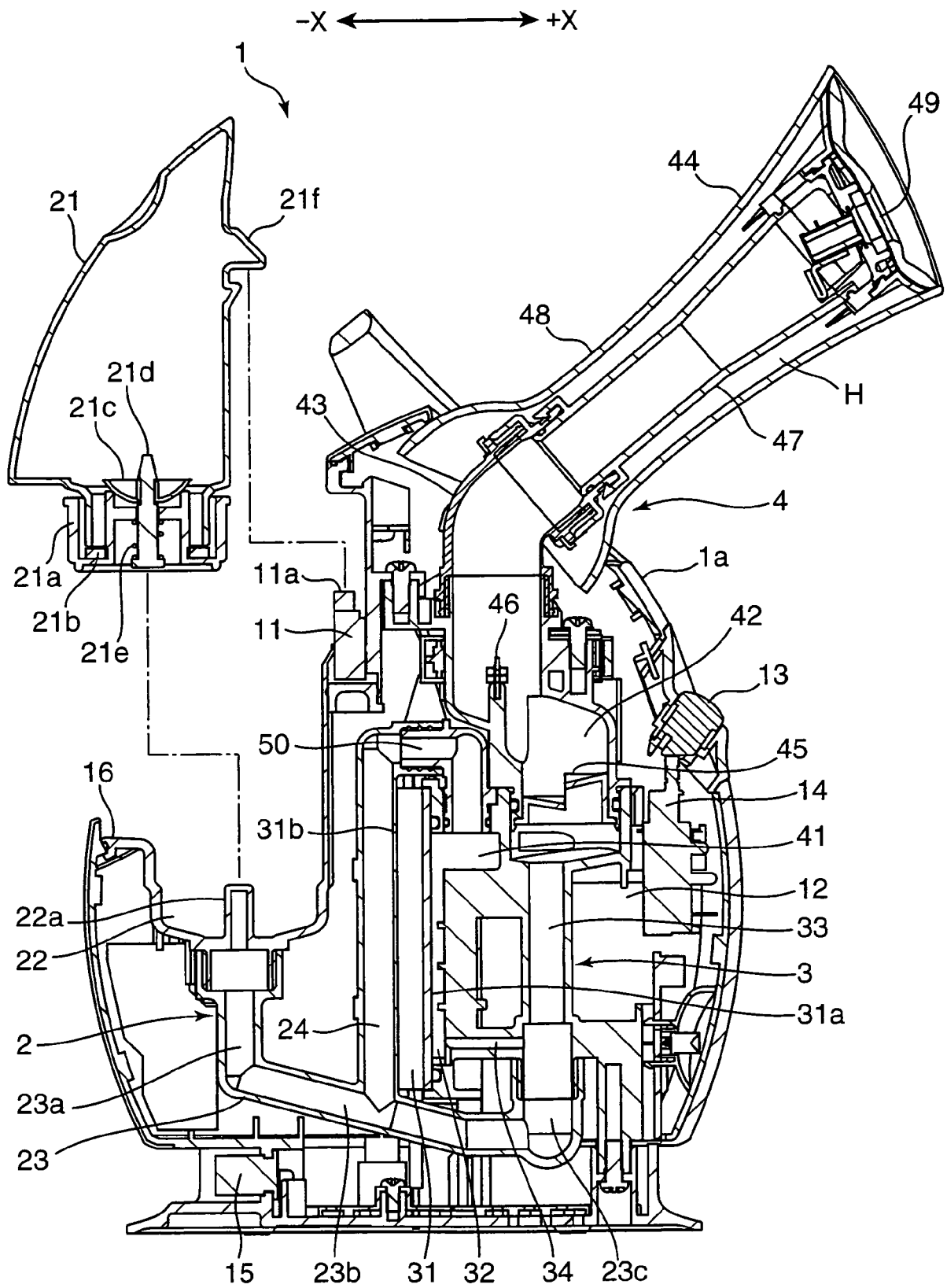


FIG. 5

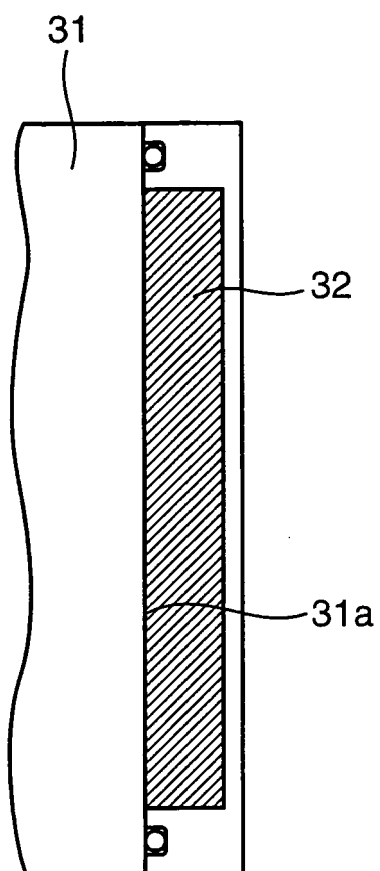


FIG. 6

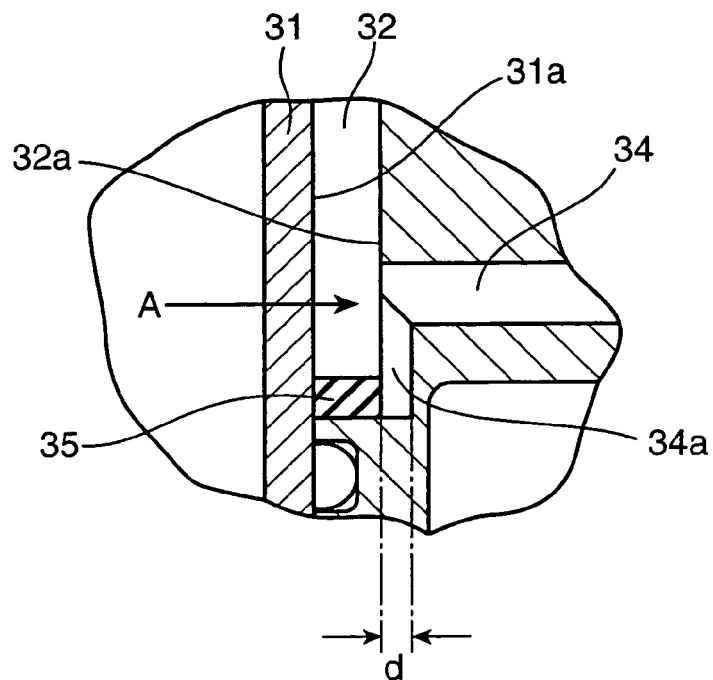


FIG. 7

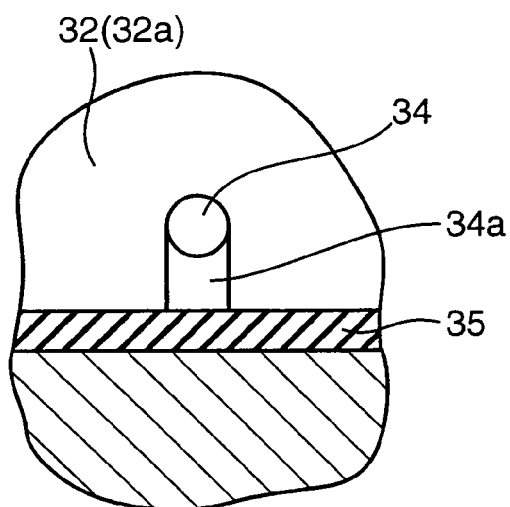


FIG. 8

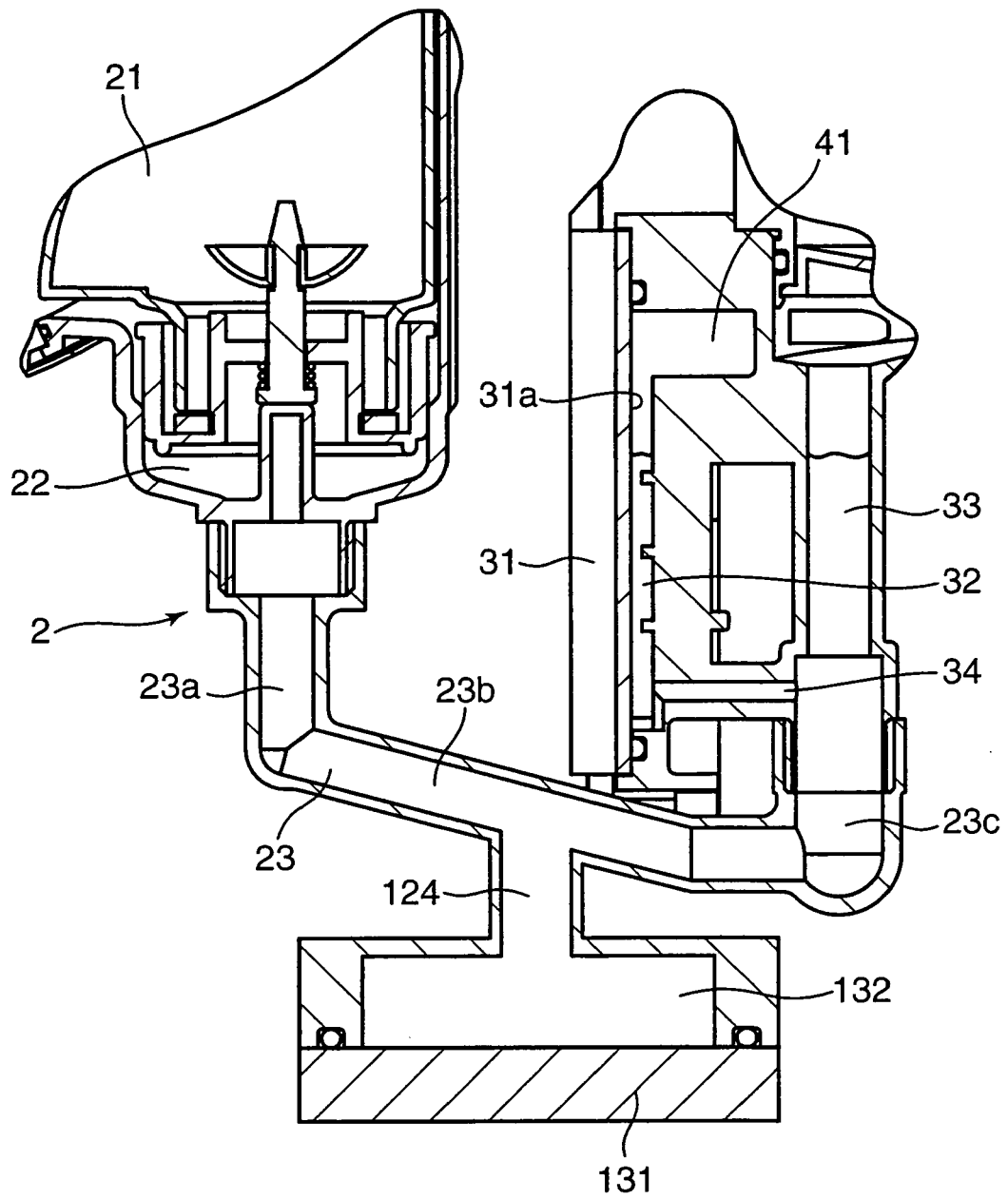


FIG. 9

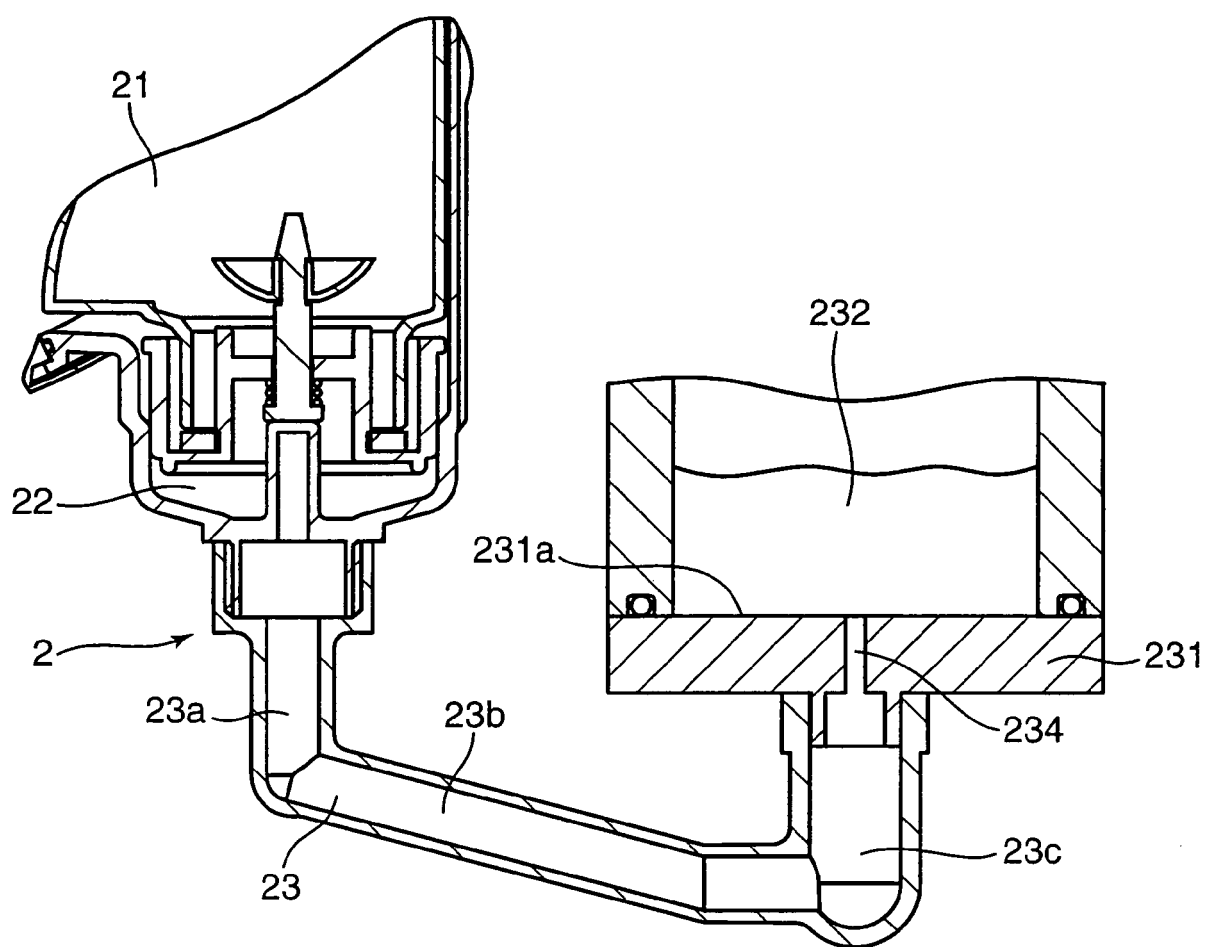


FIG. 10

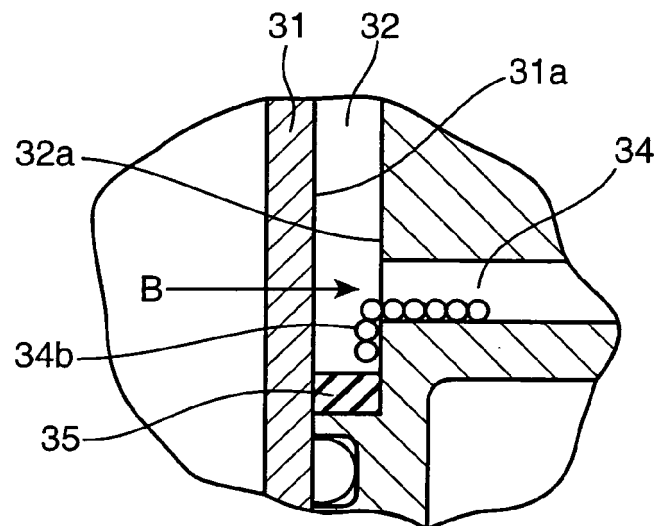
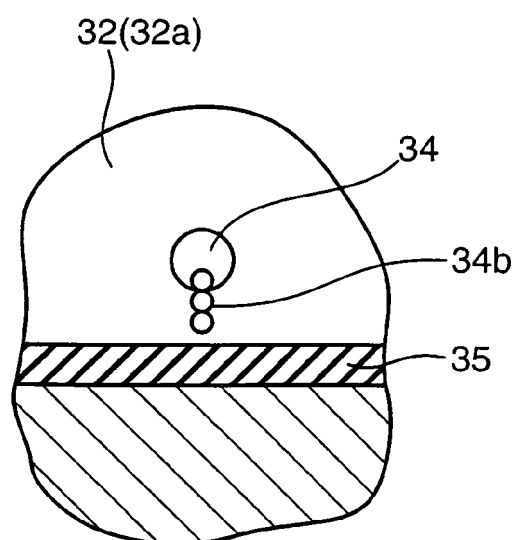


FIG. 11





European Patent
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EUROPEAN SEARCH REPORT

Application Number
EP 07 00 6178

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Place of search Munich		Date of completion of the search 26 June 2007	Examiner Schut, Timen
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