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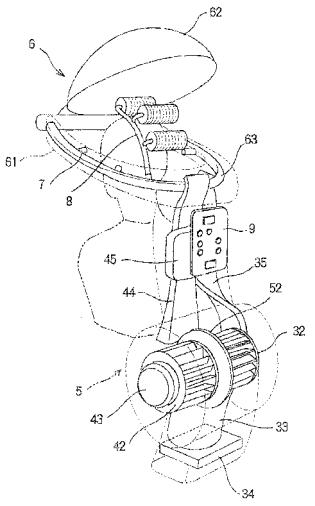
(54) PERMANENT WAVE TREATMENT METHOD AND DEVICE

(57) A permanent wave treatment device has a heating means (3) for setting hair of a to-be-treated person in a heated environment, a rod (R) on which the hair is wound and that is formed so that air can flow through it, a suction means (4) for making the pressure inside the rod negative, and a connection means (7) for connecting the rod and the suction means.

FIG.3



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Description

TECHNICAL FIELD

[0001] The present invention relates to a permanent wave treatment of hairs. More particularly, the present invention relates to a permanent wave treatment method and device therefor, in which, as a result of the treatment, hair damage is suppressed, and a wave of its finish is improved, and highly safe treatment can be carried out, as compared with a case of treatment by a conventional apparatus.

BACKGROUND

[0002] In general, permanent wave treatment is carried out in accordance with the steps described below. The steps include: curling hairs around a rod; applying a first permanent wave agent containing a reducing agent to soften and swell the hairs, followed by washing out the reducing agent adhering to the hairs, applying a second permanent wave agent containing an oxidizing agent to oxidize and fix cohesion inside the hairs, removing the rod, and drying the hairs.

[0003] Although this general permanent wave treatment method is a widely generally prevailing technique, there is a disadvantage that a wave of the treated hairs are enlarged (loosened) if the hairs are dried, and a period of retaining the wave has not been sufficiently satisfactory.

[0004] In recent years, a method for adding the step of heating hairs to permanent wave treatment by using a hair iron or a heating rod is disclosed in Japanese Patent Application Laid-open No. 2004-262798. The steps of this treatment method include: applying a first permanent wave agent containing a reducing agent to hairs to soften and swell the hairs, followed by wiping out redundant moisture by water wash; curling the hairs around a rod capable of heating them, and heating the rod, thereby heating the hairs, followed by applying a second permanent wave agent containing an oxidizing agent to oxidize and fix cohesion inside the hairs, removing the rod, and drying the hairs.

[0005] This permanent wave treatment method using a hair iron or a heating rod includes the steps of heating reduced hairs followed by oxidizing and fixing internal cohesion of the hairs (carrying out a second permanent agent), followed by washing out the second permanent wave agent, and drying the hairs.

[Patent document 1]: Japanese Patent Application Laid-open No. 2004-262798

SUMMARY OF THE INVENTION

[0006] In the foregoing prior art, the hairs curled to be overlapped around rods are merely heated from the rods, and thus, there is a need for increasing a temperature of a hair iron and a heating rod. Treatment is carried out at a temperature of 180°C or more in the case of the hair iron and at a temperature of 100 °C or more in the case of the heating rod.

[0007] Heating treatment is carried out at such a high temperature, and thus, hairs are significantly damaged. In particular, in the entire hairs, highly damaged hair tip portions are curled around the inside of a rod, and is subjected to direct rod heating, thus resulting in accelerated hair damage. In addition, a hair iron or a heating rod is approached to the head part of a subject. Thus, there has been a problem that the head part of the subject becomes hot, and the subject feels discomfort.

[0008] The present invention has been made in order to solve the foregoing problem. It is an object of the present invention to provide a permanent wave treatment method and apparatus therefor, wherein hot air is supplied to the entire hairs, and the hot air supplied via the hairs is suctioned from the inside of a rod, thereby lowly suppressing a drying temperature and reducing hair damage; there is less heat and danger associated with a subject due to a high temperature, a wave faithful to the rod is formed, a wave is not loosened even if the hairs are dried, and an initial wave state can be maintained for a long period of time.

[0009] According to a first aspect of the present invention, there is provided: a permanent wave treatment method, comprising the steps of: curling hairs around a rod; establishing a heating atmosphere with respect to the hairs curled around the rod by heating means; and in the heating atmosphere state, establishing the inside of the rod at a negative pressure state by suction means, and then, suctioning the heating atmosphere via the hairs, thereby drying the hairs.

[0010] According to a second aspect of the present invention, there is provided: a permanent wave treatment method according to the first aspect, wherein the step of stopping the heating by the heating means, and then, suctioning atmospheric air via the hairs by the suction means, thereby cooling the dried and warmed hairs is added.

[0011] According to a third aspect of the present invention, there is provided: a permanent wave treatment apparatus, comprising: heating means for subjecting hairs of a subject to a heating atmosphere; a rod for curling hairs formed so as to enable air distribution; suction means for establishing the inside of the rod at a negative pressure state; and connecting means for connecting the rod and the suction means with each other.

[0012] According to a fourth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the connecting means is composed of a tube having flexibility, and a plurality of the tubes are configured so that they can be removably mounted on the suction means.

[0013] According to a fifth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the fourth aspect, wherein the suction means on which the tubes are to be mounted is con-

figured so as to interrupt air distribution in the case where the tubes are removed.

[0014] According to a sixth aspect of the present invention, there is provided: a permanent wave treatment method according to the fourth aspect, wherein the tubes are diverged into many pieces so as to enable connection with a plurality of rods.

[0015] According to a seventh aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the means for establishing the heating atmosphere is composed of a hood positioned at a head part of a subject and air supply means for supplying hot air into the hood.

[0016] According to an eighth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the seventh aspect, wherein the hood consists of a fixed hood and a hood which is openable so as to enable backward or lateral treatment with respect to the fixed hood, and a hot air blowout port close to the air supply means and a suction port of the suction means are provided at the fixed hood side.

[0017] According to a ninth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the means for establishing the airs at the heating atmosphere is used by a radiant heat such as a heater for the head part.

[0018] According to a tenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, comprising air and water separating means for separating moisture in the hot air suctioned by the connecting means via the rod.

[0019] According to an eleventh aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the air supply means has a return air supply means for returning into the heating atmosphere the hot air from which the moisture has been removed in the air and water separating means.

[0020] According to a twelfth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the eleventh aspect, wherein deodorizing means for adsorbing and decomposing smell of a permanent wave chemical is provided in an air supply passage of the return air supply means.

[0021] According to a thirteenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the connecting means for connecting the rod and the suction means is formed of a tube having flexibility and one end of the tube is connected to a connecting member formed at one end of the rod, while the other end of the tube is connected to a plurality of accessible connecting portions formed in the suction means.

[0022] According to a fourteenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the tube and the rod are connected to each other via rotatable means.

[0023] According to a fifteenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the fourteenth aspect, wherein joint means is formed of a ball section connected to the tube side and an engagement hole with which the ball section formed at the rod side is rotatably engaged and a cap for precluding air suctioning is removably mounted on the ball section in a state in which the cap is not engaged with the engagement hole.

[0024] According to a sixteenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein a moisture exhaust wall is formed on an internal face of a closed end side of the rod for discharging the moisture adhering to the hairs to the outside so as to prevent water from being accumulated in the rod.

[0025] According to a seventeenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein the rod is divided into at least two sections along a longitudinal direction.

[0026] According to an eighteenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the seventeenth aspect, wherein the rods is divided into at least two sections along a longitudinal direction, and the divided rod is configured so as not to be separated from each other by a coupling piece.

[0027] According to a nineteenth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the sixteenth aspect or the seventeenth aspect, wherein air leakage preventing means for preventing leakage of air while in sectioning operation is provided at a joint of the divided rod.

[0028] According to a twentieth aspect of the present invention, there is provided: a permanent wave treatment apparatus according to the third aspect, wherein at least one or more sensors for measuring a temperature and humidity are mounted at proper positions of the rod or the hood side.

[0029] According to the permanent wave treatment method and apparatus of the present invention, as described previously, hairs are curled around a rod; a heating atmosphere is established by heating means with respect to the hairs curled around the rod; in the heating atmosphere, the inside of the rod is established at a negative pressure state by suction means; and the heating atmosphere is suctioned via the hairs, thereby drying the hairs. Thus, air is suctioned from the inside of the rod in a state in which the hairs are curled around the rod and the hairs are established at the heating state, whereby heating and suctioning are carried out at the same time, making it possible to lowly suppress a drying temperature of the hairs curled around the rod. Therefore, hair damage is reduced; there is less heat and danger associated with a subject due to a high temperature. Moreover, a wave faithful to the rod is formed, the wave is not loos-

ened even if the hairs are dried, and an initial wave state can be maintained for a long period of time.

[0030] In addition, connecting means is composed of a tube having flexibility, and is configured so that a plurality of the tubes can be removably mounted on suction means. Thus, a number of rods can be mounted on the suction means via the tubes. Further, the suction means on which the tubes are mounted is structured so as to interrupt air distribution in the case where the tubes are removed. Thus, suctioning of the air from the suction means on which no tube is mounted is not carried out. Therefore, only suctioning via the tubes are carried out, and thus, the suction efficiency is improved without lowering of the suction force from the rods.

[0031] In addition, the tubes are diverged into a number of sections so as to enable connection with a plurality of rods, thus making it possible to establish connection with many more rods, and permanent wave variations can be increased so as to be adapted for the preference of a subject. Further, means for subjecting hairs to a heating atmosphere is composed of a heat positioned at the heat part of the subject and air supply means for supplying hot air into the hood, thus making it possible to efficiently carry out drying of hairs while hot air can be efficiently supplied and temperature control of the hood can be precisely carried out.

[0032] In addition, the hood consists of a fixed hoot and an open/close hood which is openable to enable backward treatment with respect to the fixed hood, and a hot air blowout port close to the air supply means and a suction port of the suction means are provided at the fixed hood side. Thus, by opening the open/close hood, treatment such as curling hairs around a rod can be carried out at the back side of the subject. Therefore, treatment can be carried out at a fixed position without a movement to another seat by the subject or a hairdresser. In addition, in the case where the subject attempts to check hairs, the hairs can be check by opening the open/close hood.

[0033] Further, means for establishing hairs at a heating atmosphere is used by a radiant heat such as a heater with respect to the heat part, whereby hair drying can be carried out comparatively quickly by means of a simple apparatus. In addition, air and water separating means for separating the moisture in hot air suctioned by the connecting means via the rod is provided, thereby preventing the moisture from being discharged to the outside. Thus, a suctioning motor fan can be prevented from being corroded. In addition, hot air is supplied to the hairs by two means, i.e., return air supply means for returning the hot air having the moisture removed therefrom in the air by water separating means into the heating atmosphere; and atmospheric air supply means for supplying the hot air heated by a heater or the like having suctioned atmospheric air into the heating atmosphere. In this manner, a rate of hot air supply to hairs is increased, a drying time is reduced, and then, power of the heater can be reduced, making it possible save energy.

[0034] Further, deodorizing means for adsorbing and decomposing the smell of a permanent wave chemical is provided in the air supply passage of the return air supply means, thereby making it possible to deodorizing the smell in air and properly maintain room environment.

[0035] In addition, connecting means for connecting a rod and suction means with each other is formed of a tube having flexibility and one end of the tube is connected to a connecting member formed one end of the rod, while the other end of the tube is connected to a number of accessible connecting portions formed in the suction means. Thus, the tube is led out only while in use, and a rod is connected to a tip end of the led out tube, thereby enabling a permanent wave work. Therefore, a tube which is not used can be placed in the suction means. Accordingly, the tube which is not used does not block anything and tube maintenance is very easy.

[0036] Further, the tube and rod is connected to each other via a turnable joint means. Thus, the rod is rotated with respect to the tube, whereby the rod is fitted to hairs, prevent hairs from being pulled. In addition, the joint means is formed of: a ball section connected to the tube side; and an engagement hole with which the ball section is rotatably engaged. In addition, a cap for precluding air suctioning is removably mounted on the ball section in a state in which the cap is not engaged with the engagement hole. Thus, the rod can be easily mounted on the tube. In addition, the cap is engaged with the ball section, whereby suctioning is precluded. Therefore, only suctioning from the rod is carried out, the suction efficiency can be improved without lowering the suction force.

[0037] In addition, a rod is divided into two sections along a longitudinal direction, and the chemical accumulated inside of the rod while not in use can be cleaned. This, the rod can always be cleanly and sanitarily maintained. Further, the divided sections are prevented from being separated from each other by a coupling piece. These divided sections are not separated from each other, and thus, they are hardly lost. Alternatively, the above rod can be handled in the same manner as a rod integrated when curling hairs. In addition, air leakage preventing means for preventing air leakage while in suctioning is provided at a joint of the divided rod. Thus, a drying time is not extended by the air leakage from the joint section unlike the conventional rod.

[0038] In addition, a moisture discharge wall for discharging the moisture adhering hairs to the outside so as to prevent water from being accumulated in a rod is formed on an internal face at the closed end side of the rod. Thus, a floor or the subject's cloth is not contaminated by drop of the water or chemical from the rod. Further, at least one or more sensors for measuring a temperature or humidity is mounted at a proper position of the rod or hood side, thereby attaining advantageous effect that the temperature or humidity of hairs is maintained in an optimal state, enabling proper permanent wave treatment.

BRIEF DESCRIPTION OF THE DRAWINGS

[0039]

FIG. 1 is a side view showing an entire overview in a permanent wave treatment apparatus according to the present invention;
FIG. 2 is a side view showing essential portions of the same apparatus;
FIG. 3 is a perspective view seen from an obliquely backward direction showing a detailed view of the apparatus;
FIG. 4 is a perspective view seen from a backward direction of the same apparatus;
FIG. 5 is a perspective view showing a state before connecting male and female connectors
FIG. 6 is a perspective view showing a connection state of the same connectors;
FIG. 7A is a side cross section showing a state before connecting the male and female connectors;
FIG. 7B is a side view showing a connection state;
FIG. 8 is a side view showing a second embodiment in which an atmosphere of the subject's head part is established at a high temperature state by means of a heater device;
FIG. 9 is an oblique rear view when a dryer is used instead of the same heater device.
FIG. 10 is a side view showing a third embodiment;
FIG. 11 is a perspective view showing the same embodiment;
FIG. 12 is an illustrative view showing an internal structure;
FIG. 13 is a front view when a case is removed;
FIG. 14 is a side view of the same;
FIG. 15 is a rear view of the same as that in FIG. 13;
FIG. 16 is a top view of the same;
FIG. 17 is a perspective view showing a detailed view of a portion of suction means in the same case;
FIG. 18 is a front view showing a rod;
FIG. 19 is a sectional view taken along the line A-A of the same rod;
FIG. 20 is an exploded view showing another embodiment in a state in which a rod is divided into two sections;
FIG. 21 is an exploded view when the two divided sections of the same rod are coupled with each other by means of a coupling piece;
FIG. 22 is a plan view showing the same rod; and
FIG. 23 is a sectional view showing a state in which two divided sections of the rod are coupled with each other.

THE BEST MODES OF EMBODIMENT OF THE INVENTION

[0040] According to the present invention, in a state in which hairs of a subject are curled around a rod capable of air distribution, the hairs are established at a heating atmosphere and the inside of the rod is established at a negative pressure state by suction means via connecting means connected to the rod.

EMBODIMENT 1

[0041] Hereinafter, an preferred embodiment of a permanent wave treatment apparatus according to the present invention will be described with reference to the accompanying drawings.

[0042] In FIG. 1, reference uppercase letter A denotes a permanent wave treatment apparatus according to the present invention, which is movable for applying a first liquid containing a reducing agent to hairs while the applied hairs are left until the first liquid has been reacted, and washing out the first liquid adhering to a surface of the hairs, followed by drying the wet hair while moving a subject to a rear side of a hairdressing seat B.

[0043] The permanent wave treatment apparatus A is composed of: a base 1 having castors mounted thereon; a column 2 extended vertically from the base 1; a housing 5 having housed therein suction means 3 and air supply means 4 for blowing out hot air, described later in detail; and a hood 6 covered on the head part of a subject mounted on an upper part of the housing 5.

[0044] The inside of a lead-out section 51 in the housing 5 is divided into a suction chamber and an air supply chamber while a shield plate 52 is provided therein and motors 31 and 41 are fixed at their back on both faces of the shield plate 52. Then, scirocco type suction fan 32 is mounted on the motor 31, and a scirocco type air supply fan 42 is mounted on the motor 41.

[0045] An exhaust duct 33 is connected to an exhaust side of the suction chamber, and a muffling filter 34 compatible with a filter is mounted on an exhaust outlet of the exhaust duct 33. In addition, an exhaust outlet of a vacuum duct 35, one end of which is connected to a ring shaped suction tube 63 installed in a hood 6 described later, is disposed at a side face of the suction fan 32. Further, a dust filter 36 is mounted partway of the vacuum duct 35.

[0046] On the other hand, a suction filter 43 is mounted on a wall face which corresponds to a section opening by means of the air supply fan 42 of the housing 5 configuring the air supply chamber. In addition, a hot air duct 44 is mounted in the air supply chamber. One end of the duct is designed to supply air into the hood 6, and the other end of the duct opens at the rear side of the hood 6. In addition, a heater 45 for hating the air supplied from the air supply fan is mounted partway of the hot air dust 44. Although not shown, an ion generator for negatively ionizing the hot air from the hot air duct 44 may be mounted.

[0047] The hood 6 is composed of a fixed hood 61 and an open/close hood 62 in the same manner as an invention disclosed in Japanese Patent Application Laid-open No. 2004-416 filed by an applicant of the present invention. The open/close hood 62 is opened at the forehead

part in a state in which the subject wear the hood 62. In this opened state, this open/close hood is configured so that a hairdresser can carry out a variety of treatments from the rear head side, for example, application of a chemical or the like.

[0048] A suction tube 63 to which the vacuum duct 35 is to be connected is mounted on an inner periphery face of the fixed hood 61, and female connectors 71 of a connecting member 7 shown in FIG. 5 to FIG. 7 are mounted at a plurality of sites of the suction tube 63. This female connectors 71 are formed in a cylindrical shape having an opening section 71a on a peripheral face, as shown in FIG. 7A. At the inside of the cylinder, there are incorporated: a spring 71b and a valve 71d which closes a cylindrically shaped opening 71c by means of the spring 71b. Therefore, in a state in which a male connector 72 described later is not inserted, a valve 71d is biased by means of the spring 71b so that the valve 71d closes the opening 71c of the female connector 71. In addition, a lock groove 71e for guiding, engaging, and locking a plurality of lock protrusions 72b formed on an outer periphery face of the male connector 72 is formed on an inner periphery face of the female connector 71.

[0049] On the other hand, the male connector 72 is also formed in a cylindrical shape in the same manner as the female connector 71 and is formed in a diameter which can be inserted into the female connector 71. At a tip end, there are formed a plurality of protrusions 72a which pushes up the valve 71d against a resilient force of the spring 71b when the male connector 72 has been inserted into the female connector 71. In addition, on the peripheral face, there is formed a lock protrusion 72b which is guided to the lock groove 71e formed on the inner periphery face of the female connector 71, and then, is engaged therewith.

[0050] In the thus configured connector 7, in a state in which the male connector 72 is disconnected from the female connector 71, the valve 71d closes the opening 71c. Thus, even if the suction tube 63 is established at a suction state, suctioning is not carried out from the connector 7. In addition, in the case where the male connector 72 is engaged with the female connector 71, the valve 71d is retracted, and the opening section 71a communicates with the male connector 72. Thus, the inside of the rod connected to the tip end of the tube 8 enters a negative pressure state via a tube 8 connected to the male connector 72.

[0051] Reference numeral 8 denotes a flexible tube engagingly fixed to the male connector 72. Thus tube is diverged into a plurality of sections partway, and a tip end of each of these sections is structured so as to be removably connected to a rod R curling the subject's hairs. Although not shown, the rod R is formed in the shape of a number of elongated holes or circular holes so as to suction the hot air in the hood 6 via the hairs in a state in which the hairs are curled around the rod R.

[0052] Reference numeral 9 denotes an operating panel mounted on a rear face of the housing 5 described previously. Operating buttons such as a power supply button and an air supply temperature control button or a time setting button are mounted on this operating panel and a display face for displaying a temperature and a time is mounted. In addition, a control circuit for stopping air supply or suction by means of temperature monitoring is incorporated therein.

[0053] Now, a method for carrying out permanent wave treatment by using a permanent wave treatment apparatus according to the present invention will be described by way of example with reference to the accompanying drawings.

[0054] First, a first liquid which is a reducing agent for permanent wave treatment is applied to hairs; the applied hairs are left for 5 to 20 minutes, and the hairs are softened and swelled. Then, the hairs after softened are washed, and redundant moisture is removed. After the redundant moisture has been removed, a permanent wave second agent is applied, and then, the applied hairs are round around a rod R. Then, a tip end of the tube 8 is connected to the rod R, the tube being diverged in a state in which the open/close hood 61 in the hood 6 is opened forwardly.

[0055] Then, the open/close hood 62 is closed; the operating panel 9 is operated; a temperature and a time of a hot air is set; and then, the air supply means 4 and suction means 3 are established at a driven state. Then, an air supply fan 42 rotates, clean air is supplied to a hot air duct 44 via a suction filter 43, and the hot air heated by a heater 45 is supplied into the hood 6.

[0056] On the other hand, a suction fan 32 also rotates, and thus, air is discharged to an exhaust duct 33 via the tube 8, a suction tube 63, and a vacuum duct 35. Therefore, the inside of the rod R is established at a negative pressure state, and the hot air in the hood 6 is discharged from the suction tube 63 via an air distributing section formed in the rod R through the hairs At this time, a number of air distributing sections are formed in the rod R so that the hot air passes through the entirety curled around the rod R, and drying is carried out within a short period of time.

[0057] After the drying step has terminated, the air supply means 3 is stopped, and only the suction means 2 is operated to cool the suctioned and heated hairs. After the cooling has terminated, a second liquid which is a permanent wave oxidizing agent is applied to the hairs curled around the rod 1, and the applied hairs are left for 1 to 15 minutes. After hair oxidization has terminated, the rod 1 is removed, dried, and styled, whereby the work terminates.

[0058] In the foregoing description, in the case where the tube 8 is disconnected from the suction tube 63, the opening 71c at the suction side in the female connector 71 is closed. Thus, the suction force from another connector 7 is not lowered. However, in the case where the rod R is disconnected from a portion diverged from the tube 8, suctioning from a portions from which this rod R is disconnected is carried out, and the suction force in

another rod R is lowered. Thus, it is desirable that a connecting portion between the tube 8 and the rod R be structured such that suctioning is not carried out from the tube 8 removed from in the case where the rod R has been disconnected.

[0059] As another permanent wave treatment method, while the foregoing treatment method is featured by applying a second permanent wave agent, followed by curling hairs around the rod R as a timing of curing hairs around the rod R, a second treatment method is featured by applying a first permanent wave agent 1, followed by curling hairs around the rod R.

EMBODIMENT 2

[0060] Now, a second embodiment shown in FIG. 8 and FIG. 9 will be described here.

[0061] While the foregoing embodiment has described that the atmosphere in the hood 6 is established at a heated state, the present embodiment describes that a heat is radiated from a heater to the entire head part of a subject, and then, the inside of a rod R is established at a negative pressure state, thereby carrying out drying of hairs.

[0062] In FIG. 8, the embodied apparatus is structurally composed of: heating means 10 having a structure disclosed in Japanese Patent Application Laid-open No. Hei 1-221104, the heating means rotating a heater and a heat source 10a formed in a ring shape, the heat source radiating a heat from the heater via a reflection place so as to be radiant over the head part of a subject, for example; and a suction device 101 having only the suction means 4 described previously incorporated therein. The previously described tube 8 is led out from the suction device 101, and a rod R is mounted on a tube diverged from this tube 8. In this manner, like the first embodiment described previously, the atmosphere of the subject's head part is established at a heated state by the heating means 10. Therefore, hair drying can be carried out within a short period of time by suctioning the heat via the rod R.

[0063] In FIG. 9, hairs are brown by a publicly known dryer instead of the heating means 10 described previously and a heat from the dryer is suctioned by means of the suction device 101. As in FIG. 8, hair drying can be carried out within a short period of time.

EMBODIMENT 3

[0064] Now, a third embodiment will be described with reference to FIG. 10 to FIG. 19. The same constituent elements in each of the embodiments described above are designated by the same reference numerals. A duplicate description is omitted here.

[0065] Suction means 201, return air supply means 202, atmospheric air supply means 203, and air and water separating means 204 shown in FIG. 12 to FIG. 16 are mounted on a base 1 having castors mounted thereon. These means 201 to 204 each are covered with a case 205.

[0066] in addition, in front of an upper face of the case 205, a semicircular arm 206 is rotatably mounted on the case 205, and a hood 207 is mounted over this arm 206 and part of a top plate 205a of the case 205. This hood 207 is composed of an non-ventilating cloth having flexibility, and is structured to cover the head part from the forehead to the collar part of the subject.

[0067] In addition, a panel is mounted on the top plate 205a, the panel having: a timer witch for setting a time for driving the variety of means; a temperature and humidity setting switch for setting a temperature and humidity in the hood 207; and a panel 205b having a liquid crystal display plate or the like for displaying the set state.

[0068] The suction means 201 housed in the case 205 is compose of: a plurality of suction piles 201a (two suction pipes shown); and a suction chamber 211 which consists of a motor and a section fan, a lower end of the suction pipe 201a being connected via the air and water separating means 204 described in detail. An upper end of the suction pipe 201 is closed by means of a cap plate 201c having a number of insert ports 201b formed thereon.

[0069] At the insert ports 201c opened on the cap plate 201b in the suction pipe 201a, as shown in FIG. 17 to FIG. 19, the tube 8 is accessible and is inserted in an air tight state between the insert port 201c and the tube 8. In addition, at a tip en of the tube 8, a removable ball section 81 is mounted on an engagement hole 82a of a closing member 82 mounted on the rod R described later. A removable air hole 81a is communicating with the tube 8 is formed at this ball section 81. In addition, a cap 83 is removably mounted on this air hole 81b.

[0070] The rod R is formed in a cylindrical shape in the same manner as a known rod. In addition, an air distribution hole R1 is formed at an outer periphery of the rod R. The ball section 81a is removable at one end and the closing member 82 is engagingly fitted so that a hemisphere shaped engagement hole 82a is formed, the engagement hole being rotatably engaged. In addition, a sectional protrusive moisture exhaust wall R2 is formed for the moisture generated from the hairs when a permanent wave chemical is applied to the other end of the rod R to be prevented from being accumulated in the rod R. In addition, joint means is composed of the call 81 and the closing member 82.

[0071] In the thus configured suction means 201, suctioning is carried out by means of a suctioning chamber 211 so that the inside of the air and water separating means 204 connected to the suction chamber 211 enters a negative pressure state. When the inside of the air and water separating means 204 enters a negative pressure state, the inside of a suction pipe 201a also enters a negative pressure state. Thus, the inside of the rod R connected to the suction pipe 201a via the tube 8 also enters a negative pressure state so that the permanent wave chemical supplied to the hairs curled around the rod R is suctioned from the air distributing hole R1, and

the suctioned chemical is supplied into the air and water separating means 204.

[0072] The chemical-containing air is separated into a moisture and an air by means of the air and water separating means 204, and only the separated air is supplied into the suction chamber 211. The moisture of the chemical or the like is reserved in the air and water separating means 204. This moisture may be discarded by clerks or the like after work.

[0073] The smell of the chemical is contained in the air from which the moisture is removed by the air and water separating means 204. Thus, deodorizing means for adsorbing and decomposing the smell is disposed in pipeline connecting the air and water separating means 204 and the suction chamber 211 with each other, whereby no smell enters the suction chamber 211.

[0074] A return pipe 202a of a circulating air supply means 202 is connected to the discharge side of the suction chamber 211, and an upper end of the return pipe 202a protrudes from the top plate 205a and opens in the hood 207. Therefore, the air suctioned in the suction chamber 211 is supplied into the hood 207 via the return pipe 202a. In the case where there is no need for the circulating air supply means 202, an exhaust pipe 211a is mounted on the suction chamber 211 to discharge air to the outside. In addition, in the case where a structure for returning air to the hood 207 by utilizing the circulating air supply means 202 or a structure for discharge air by utilizing the exhaust pipe 211a is selectively provided, switching means such as damper may be used.

[0075] Now, the atmospheric air supply means 203 will be described here. An air supply chamber 213 is provided adjacent to the inside of the suction chamber 211, an air supply fan is disposed while the motor is shared, and atmospheric air is taken into the air supply chamber 213 from an atmospheric air introducing pipe 213a. Then, the taken atmospheric air is supplied into the air supply pipe 203a which protrudes from the top plate 205a and which opens in the hood 207. Here, a heater 203b is incorporated in the air supply pipe 203a so that the suctioned atmospheric air is heated, and is supplied into the hood 207.

[0076] Although not shown, a sensor for detecting a temperature or humidity of hairs is disposed at a desired position of the hood 207 or in the rod R, and a lead wire from the sensor is connected to a temperature control circuit incorporated in a panel 205b. In the case where hairs are established at a heated state by a heat generated by a heater as shown in FIG. 8, a sensor for detecting a temperature or humidity is installed at only the rod R.

[0077] Now, an operation in the present embodiment will be described here. First, in a state in which an arm 206 having the hood 207 mounted thereon is rotated upwardly a subject is caused to set down on a seat disposed at a front side. In this state, a tube 8 is pulled out from suction means 201, and a cap 83 is removed from an air hole 81a of a ball section 81 mounted on a tip end of the tube 8.

[0078] Next, the ball section 81 is engaged with an engagement hole 82a of a closing member 82 mounted on a rod R. Next, the subject's hairs are curled around the rad R. At this time, the rod R is turnable with respect to the tube 8, thus facilitating a work of curling the hairs around the rod R. In addition, the hairs are not pulled after curled, and thus, the subject does not feel pain caused by the hairs being pulled.

[0079] Then, the arm 206 is rerotated to a horizontal state, and the head part of the subject is covered with the hood 207. Then, a hot air temperature is set in a panel 205b, i.e., an air supply temperature and a treatment time are set by means of a heater 203b, and permanent wave treatment is started.

[0080] When the treatment is started, power is supplied to the heater 203b and atmospheric air is suctioned from an air supply chamber 213. The suctioned air is introduced into an atmospheric air introducing pipe 203a, and the introduced atmospheric air is heated by means of the heater 203b. The heated air is supplied to the hood 207. On the other hand, suctioning is started in the suction chamber 211 so that the inside of the rod R enters a negative pressure state, and hot air is suctioned from the air distributing hole R1 of the rod R. Therefore, the hot air in the hood R is suctioned via the hairs, and the suctioned air is introduced into the air and water separating means 204 via the suction pipe 201a.

[0081] The moisture contained in the hot air suctioned in this air and water separating means 204 (mainly, permanent wave chemical) is separated, and only the hot water is suctioned into the suction chamber 211. In the case where the side of the return air supply means 202 is opened in this suction chamber 211, the hot air is supplied from the suction chamber 211 to the return pipe 202a. Thus, this hot air is rerotated into the hood 207 via deodorizing means.

[0082] Then, the hot air from the return pipe 202a and the hot air from the air supply pipe 203a are supplied to the hood 207, and thus, the inside of the hood 207 becomes hotter than a case of supplying the hot air from the air supply pipe 203a. Therefore, power of the heater 203b can be reduced, and energy saving can be achieved.

[0083] Although the hot air is thus supplied into the hood 207, a sensor always monitors a temperature in the hood 207 or a temperature of hairs. Thus, in the case where the temperature is higher than its initially set temperature, power supply to the heater 203b is stopped or power is reduced so as to control the temperature to its predetermined temperature. In addition, in the case where the temperature is reduced, power to the heater 203b is increased, and the temperature is controlled to its predetermined temperature, whereby the temperature of the hood 207 is maintained to be constant.

[0084] Then, after such control has been made, the set time is reached, all operations terminate, and a buzzer or the like driven to notify the fact to a hairdresser. In this manner, the hairdresser rises the arm 206, removes the

rod R while the hood 207 is avoided from the subject' s head part; the tube 8 is pushed into the suction pipe 201a; and the cap 83 is engagingly fitted to the ball section 81, whereby the work terminates.

[0085] FIG. 20 to FIG. 23 each show a rod R in another embodiment. In the case of the rod described previously, the inside of the rod enters a closed state other than at the side of the closing member 82 and the air distributing hole R1. Thus, if the suctioning is carried out in a state in which hairs are curled, although the chemical applied to the hairs is discharged from a moisture discharge wall R2, the chemical is accumulated by using it for an extended period of time.

[0086] In the present embodiment, a rod R is divided into at least two sections R, R' along a longitudinal direction (although the rod is divided into two sections in the embodiment, it maybe divided into three or four sections. Hereinafter, a description will be given by example of dividing the rod into two sections). A closing member 82 is formed to be integrated with one rod R, one of the divided sections (FIG. 20). Alternatively, at the time of ejection molding of the rod R, two rods R and R' are formed so that both ends thereof are not separated by coupling them with a thin coupling piece R3 (FIG. 21) .

[0087] When the rod R is divided in this manner, in the case where dirt occurs inside of the rod R, the rod R is opened, thereby making it possible to clean the inside of the rod. However, if the two rods R and R' are merely joined with each other, there is a possibility that air leakage occurs at the time of suctioning from the joint. Therefore, a recess R4a and a protrusion R4b are formed on two pairs of rim opposite faces separated from each other, as illustrated, and these recess and protrusion R4a and R4b are engaged with each other, thereby making it possible to prevent air leakage from two edges.

[0088] However, although significant air leakage can be prevented with such a recess and protrusion, there is a possibility that slight air leakage occurs because a degree of coherence on the rim opposite face divided into two sections is low. Therefore, as shown in FIG. 22 and FIG. 23, the foregoing recess and protrusion R4a and R4b are formed on the rim opposite face at the side of the coupling piece R3; a protrusive stripe R5a with a hook is formed at other one side of other rim opposite face; and an elongated groove R5b having a hook section of the protrusive stripe R5a engaged therewith is formed at the other side thereof, whereby air leakage can be prevented by engagement between the recess and protrusion R4a and R4b at the side of the coupling piece R3. In addition, the other side is integrated by engagement between the protrusive stripe 5a and the elongated groove R5b. Thus, the air leakage from a divisional portion of the rod R is prevented and the rod R can be prevented from being separated during treatment. Of course, the protrusive stripe R5a with a hook and the elongated groove R5b are disengaged from each other at the time of cleaning, thereby enabling division.

[0089] Although the air distribution hole R1 has been formed in the shape of an elongated hole at the rod R shown in FIG. 17 to FIG. 23, a proper number of the distributing holes R1 may be formed on a circumference in the shape of a circular hole.

INDUSTRIAL APPLICABILITY

[0090] The invention relates to a permanent wave treatment method and device which applies the permanent wave treatment to the hair of the subject in a beauty or hair dressing parlor.

Claims

1. A permanent wave treatment method, comprising the steps of:

   curling hairs around a rod;
   establishing a heating atmosphere with respect to the hairs curled around the rod by heating means; and
   in the heating atmosphere state, establishing the inside of the rod at a negative pressure state by suction means, and then, suctioning the heating atmosphere via the hairs, thereby drying the hairs

2. A permanent wave treatment method as claimed in claim 1, wherein the step of stopping the heating by the heating means, followed by suctioning atmospheric air via the hairs by the suction means, thereby cooling the dried and warmed hairs is added.

3. A permanent wave treatment apparatus, comprising:

   heating means for subjecting hairs of a subject to a heating atmosphere;
   a rod for curling hairs formed so as to enable air distribution;
   suction means for establishing the inside of the rod at a negative pressure state; and
   connecting means for connecting the rod and the suction means with each other.

4. A permanent wave treatment apparatus as claimed in claim 3, wherein the connecting means is composed of a tube having flexibility, and a plurality of the tubes are configured so that they can be removably mounted on the suction means.

5. A permanent wave treatment apparatus as claimed in claim 4, wherein the suction means on which the tubes are to be mounted is configured so as to interrupt air distribution in the case where the tubes are removed.

6. A permanent wave treatment method as claimed in

claim 4, wherein the tubes are diverged into many pieces so as to enable connection with a plurality of rods.

7. A permanent wave treatment apparatus as claimed in claim 3, wherein the means for establishing the heating atmosphere is composed of a hood positioned at a head part of a subject and air supply means for supplying hot air into the hood.

8. A permanent wave treatment apparatus as claimed in claim 7, wherein the hood consists of a fixed hood and a hood which is openable so as to enable backward or lateral treatment with respect to the fixed hood, and a hot air blowout port close to the air supply means and a suction port of the suction means are provided at the fixed hood side.

9. A permanent wave treatment apparatus as claimed in claim 3, wherein the means for establishing the airs at the heating atmosphere is used by a radiant heat such as a heater for the head part.

10. A permanent wave treatment apparatus as claimed in claim 3, comprising air and water separating means for separating moisture in the hot air suctioned by the connecting means via the rod.

11. A permanent wave treatment apparatus as claimed in claim 3, wherein the air supply means has a return air supply means for returning the hot air having the moisture removed therefrom in the air by water separating means into the heating atmosphere.

12. A permanent wave treatment apparatus as claimed in claim 11, wherein deodorizing means for adsorbing and decomposing smell of a permanent wave chemical is provided in an air supply passage of the return air supply means.

13. A permanent wave treatment apparatus as claimed in claim 3, wherein the connecting means for connecting the rod and the suction means is formed of a tube having flexibility and one end of the tube is connected to a connecting member formed at one end of the rod, while the other end of the tube is connected to a plurality of accessible connecting portions formed in the suction means.

14. A permanent wave treatment apparatus as claimed in claim 3, wherein the tube and the rod are connected to each other via rotatable means.

15. A permanent wave treatment apparatus as claimed in claim 14, wherein joint means is formed of a ball section connected to the tube side and an engagement hole with which the ball section formed at the rod side is rotatably engaged and a cap for precluding air suctioning is removably mounted on the ball section in a state in which the cap is not engaged with the engagement hole.

16. A permanent wave treatment apparatus as claimed in claim 3, wherein a moisture exhaust wall is formed on an internal face of a closed end side of the rod for discharging the moisture adhering to the hairs to the outside so as to prevent water from being accumulated in the rod.

17. A permanent wave treatment apparatus as claimed in claim 3, wherein the rod is divided into at least two sections along a longitudinal direction.

18. A permanent wave treatment apparatus as claimed in claim 17, wherein the rods is divided into at least two sections along a longitudinal direction, and the divided rod is configured so as not to be separated from each other by a coupling piece.

19. A permanent wave treatment apparatus as claimed in claim 16 or claim 17, wherein air leakage preventingmeans for preventing leakage of air while in suctioning operation is provided at a joint of the divided rod.

20. A permanent wave treatment apparatus as claimed in claim 3, wherein at least one or more sensors for measuring a temperature and humidity are mounted at proper positions of the rod or the hood side.

FIG. 1

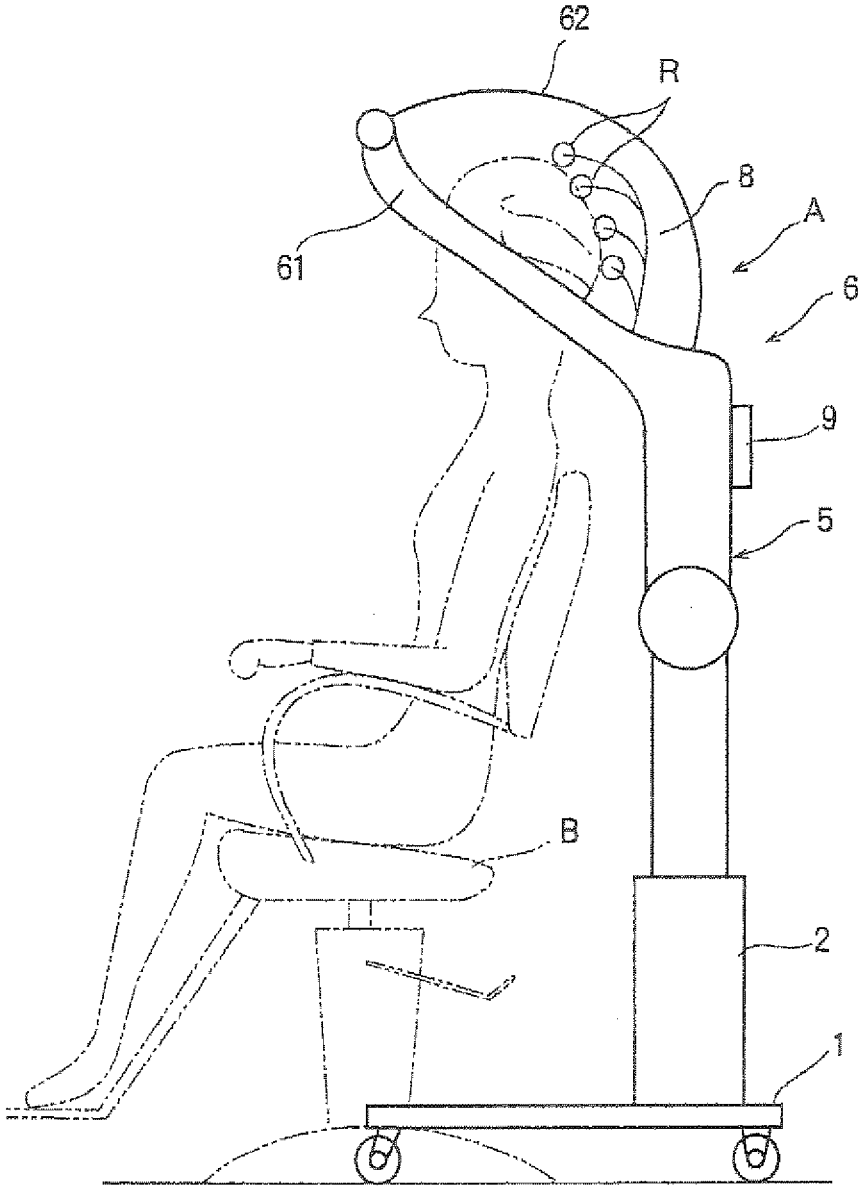


FIG.2

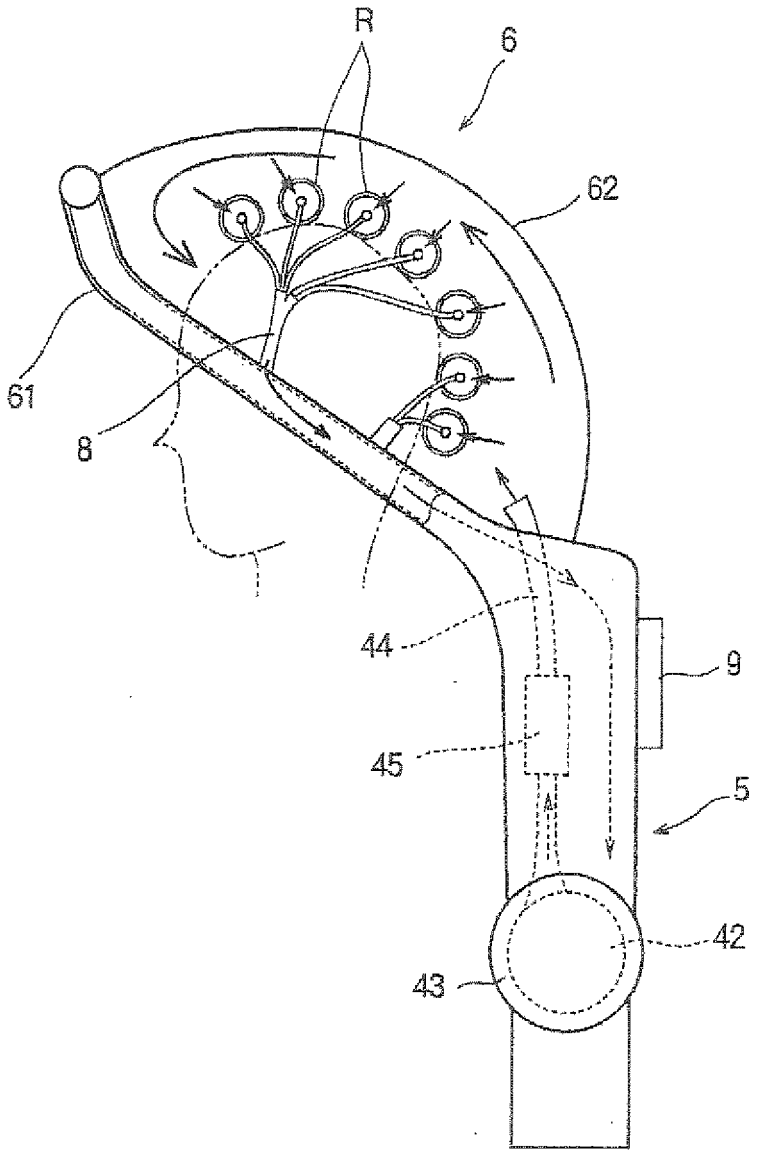


FIG.3

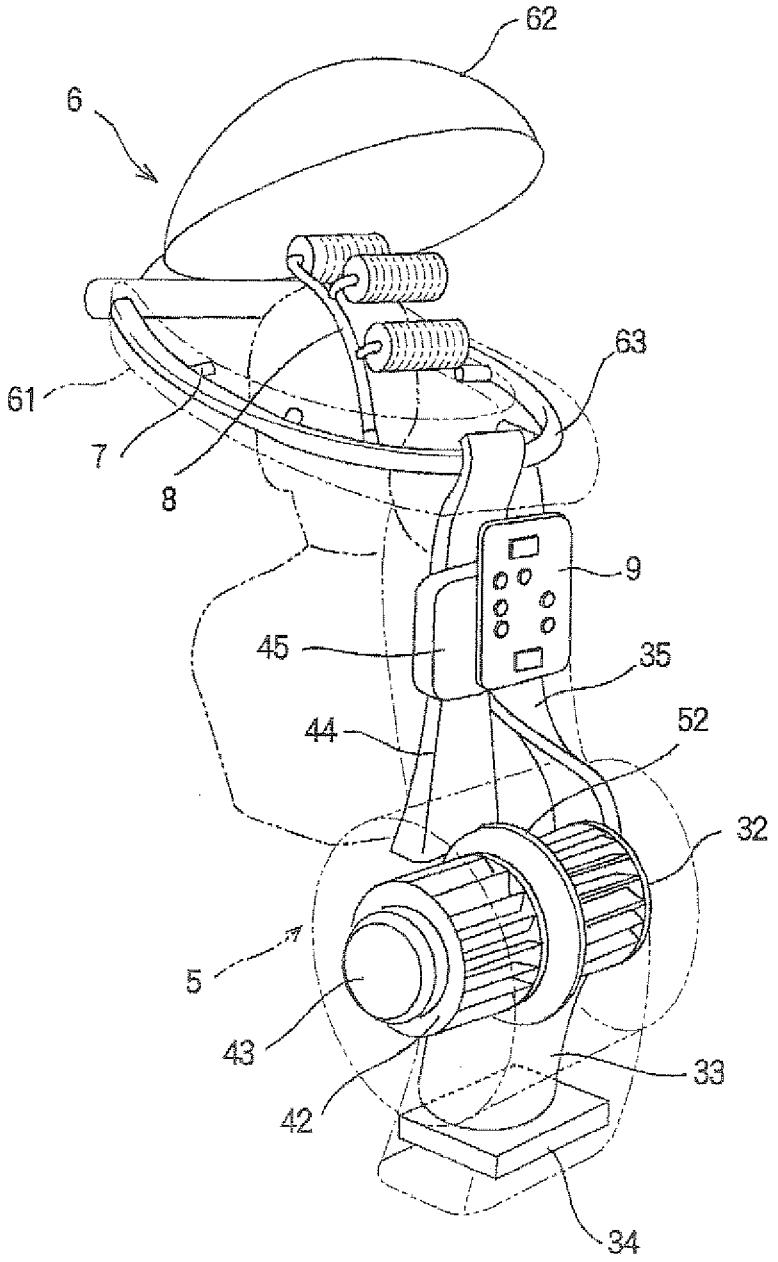


FIG.4

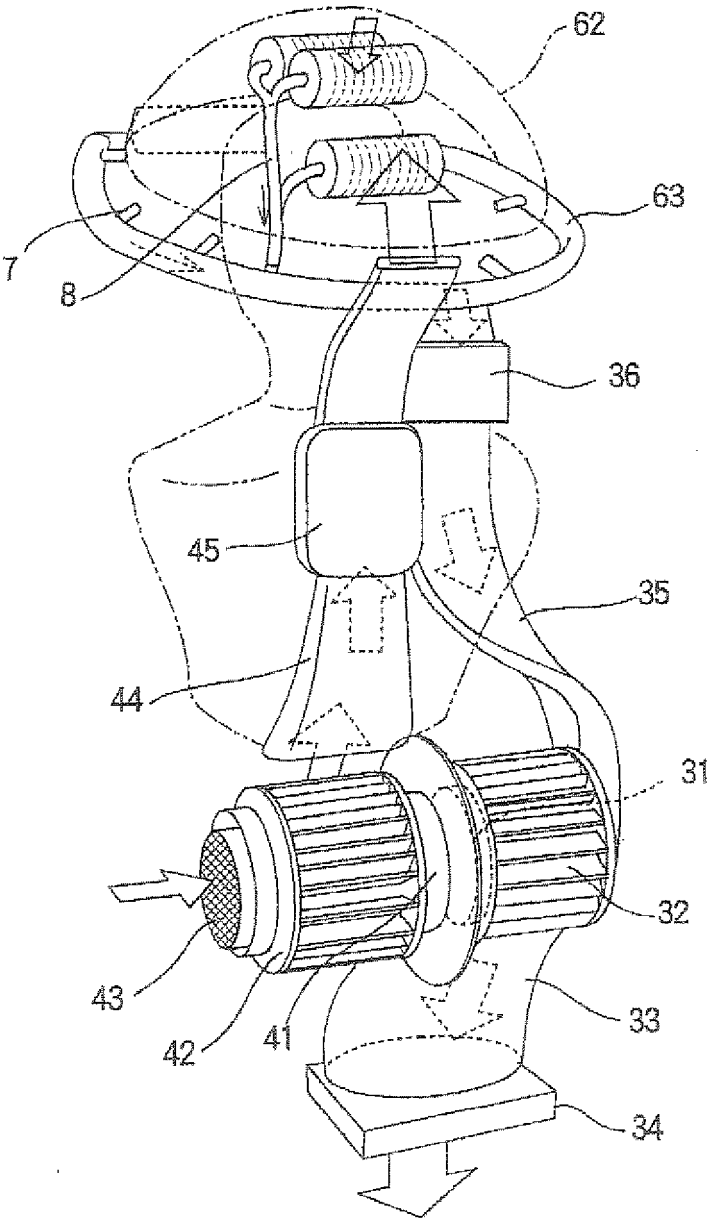


FIG.5

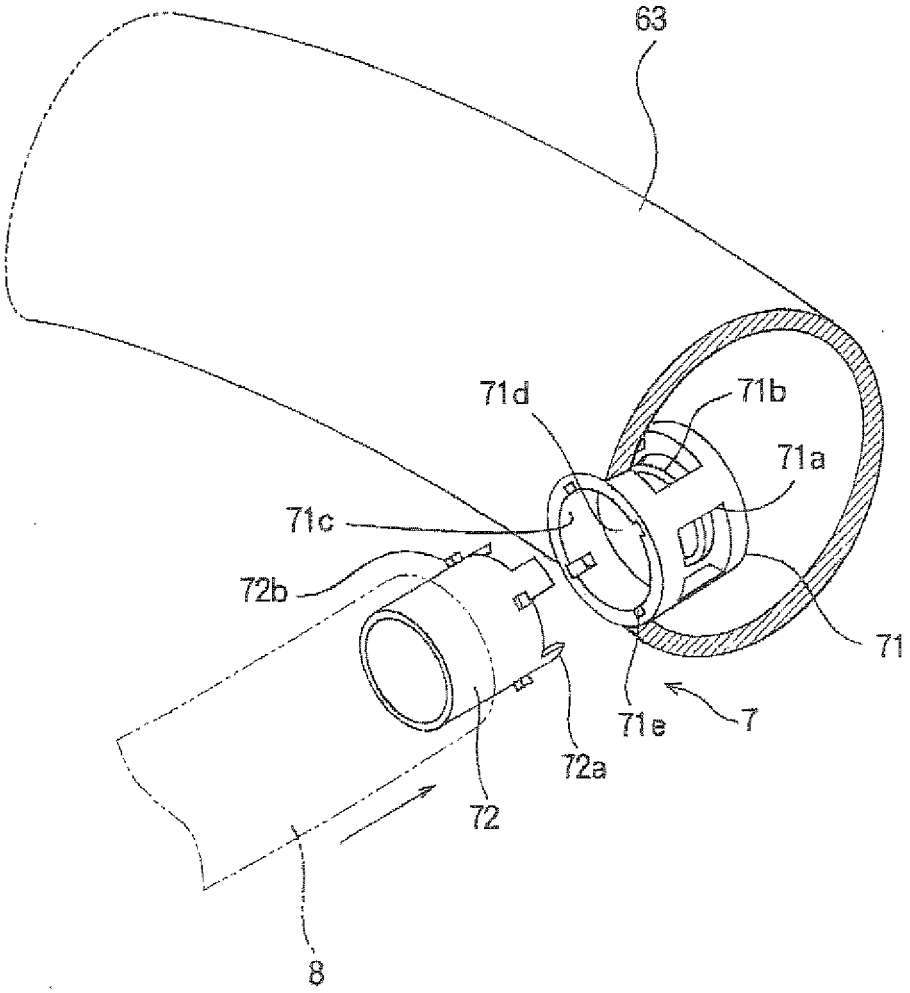


FIG.6

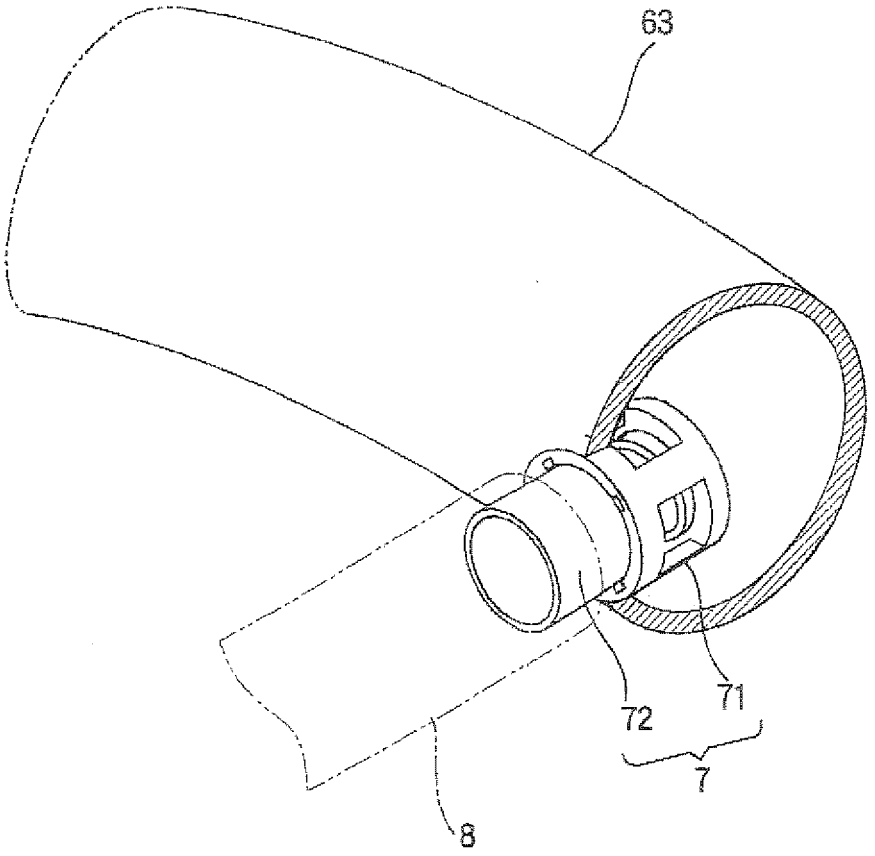


FIG.7(a)

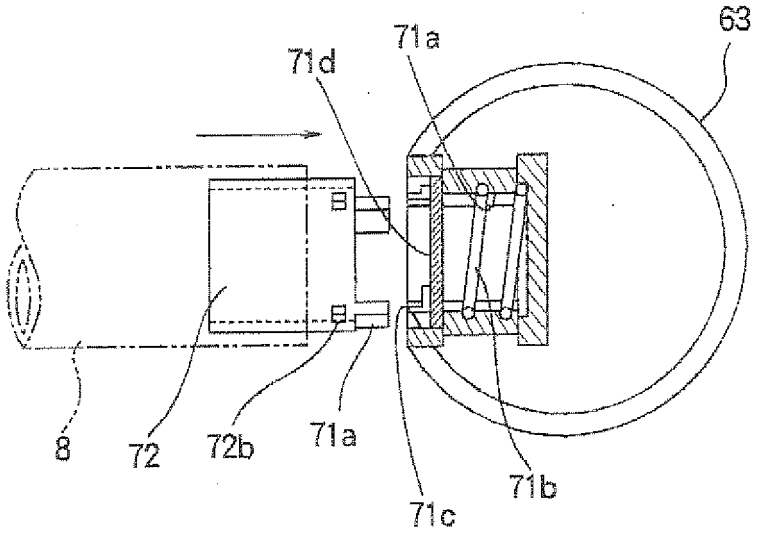


FIG.7(b)

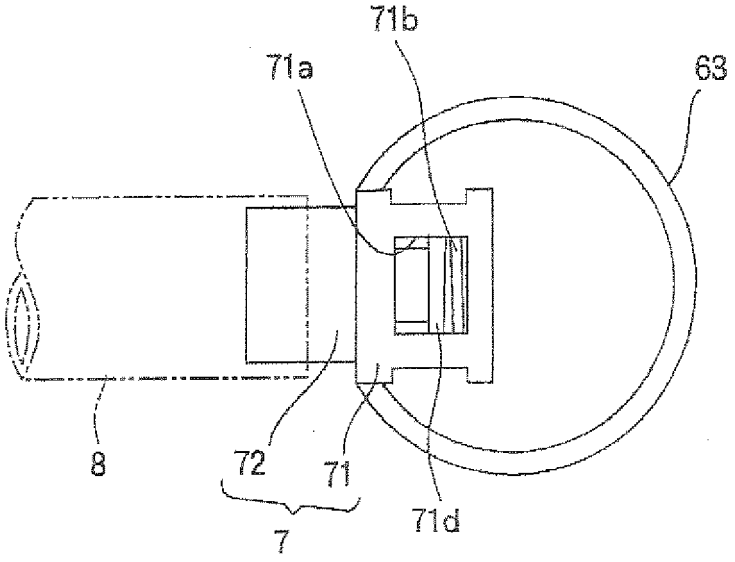


FIG. 8

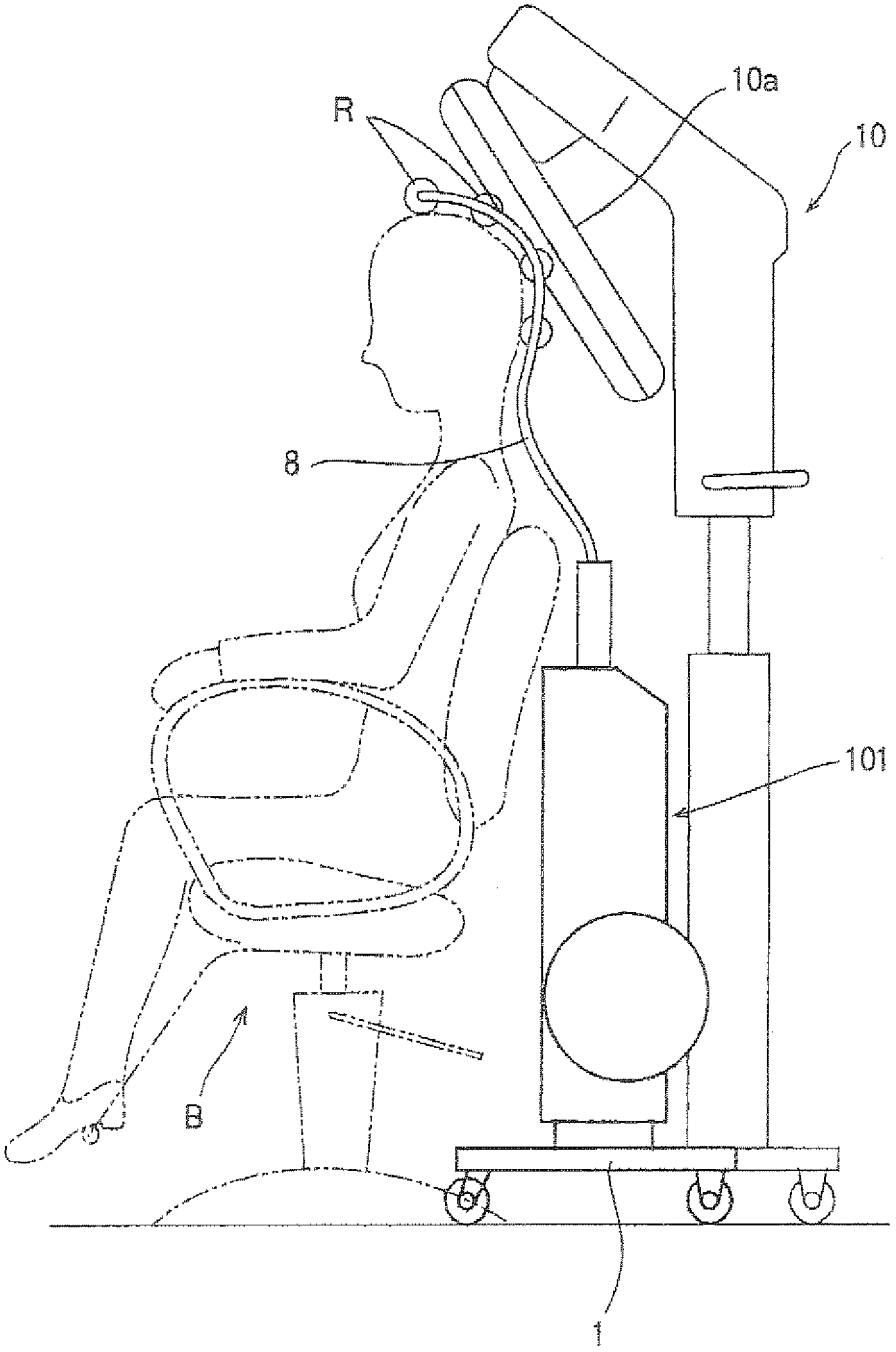


FIG.9

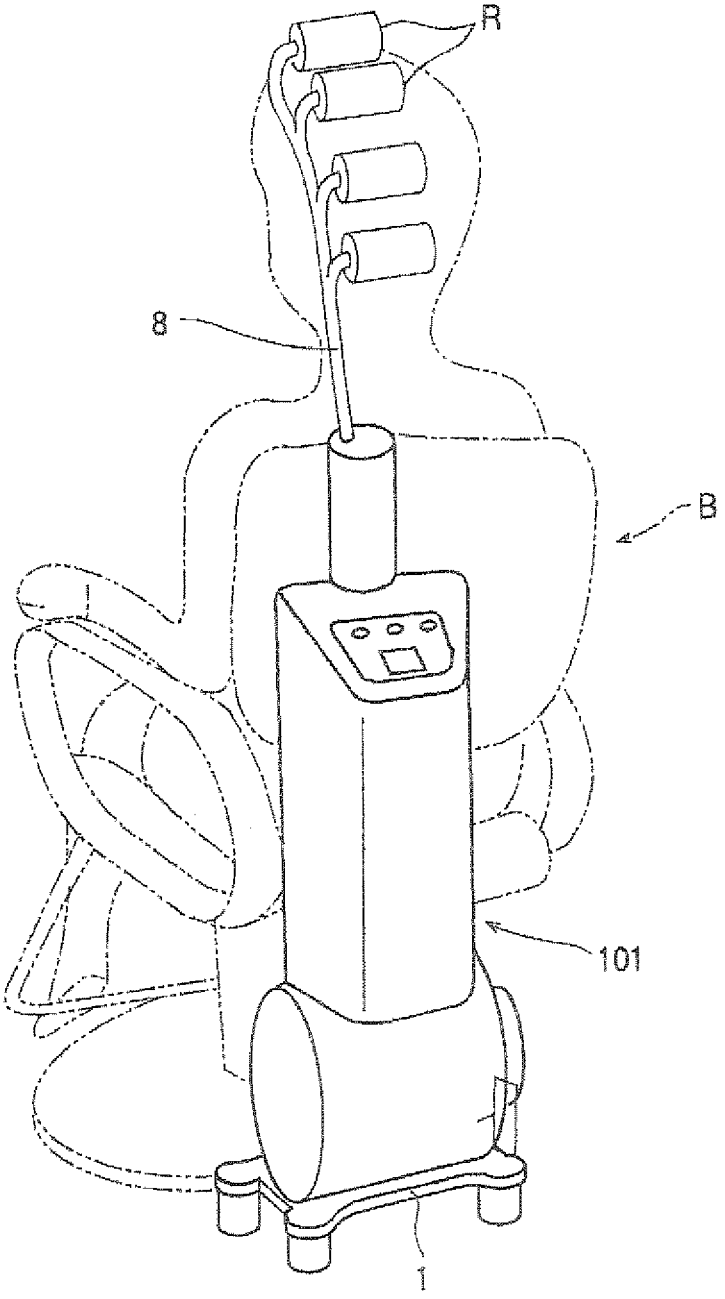


FIG.10

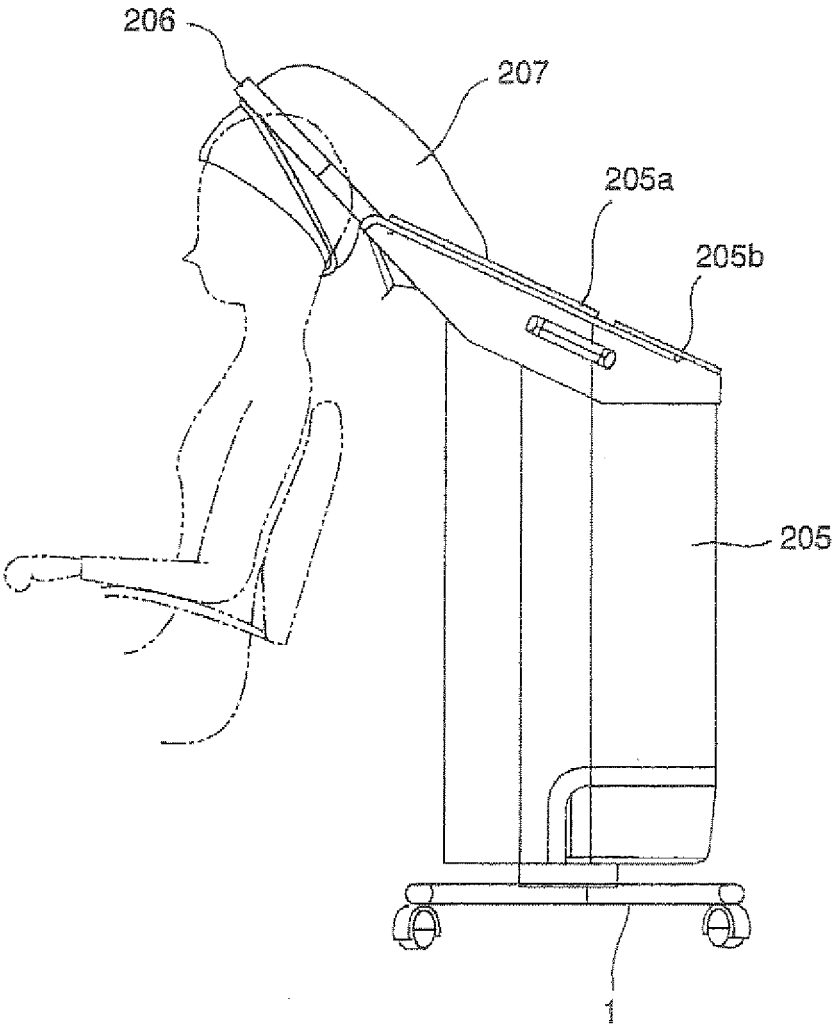


FIG.11

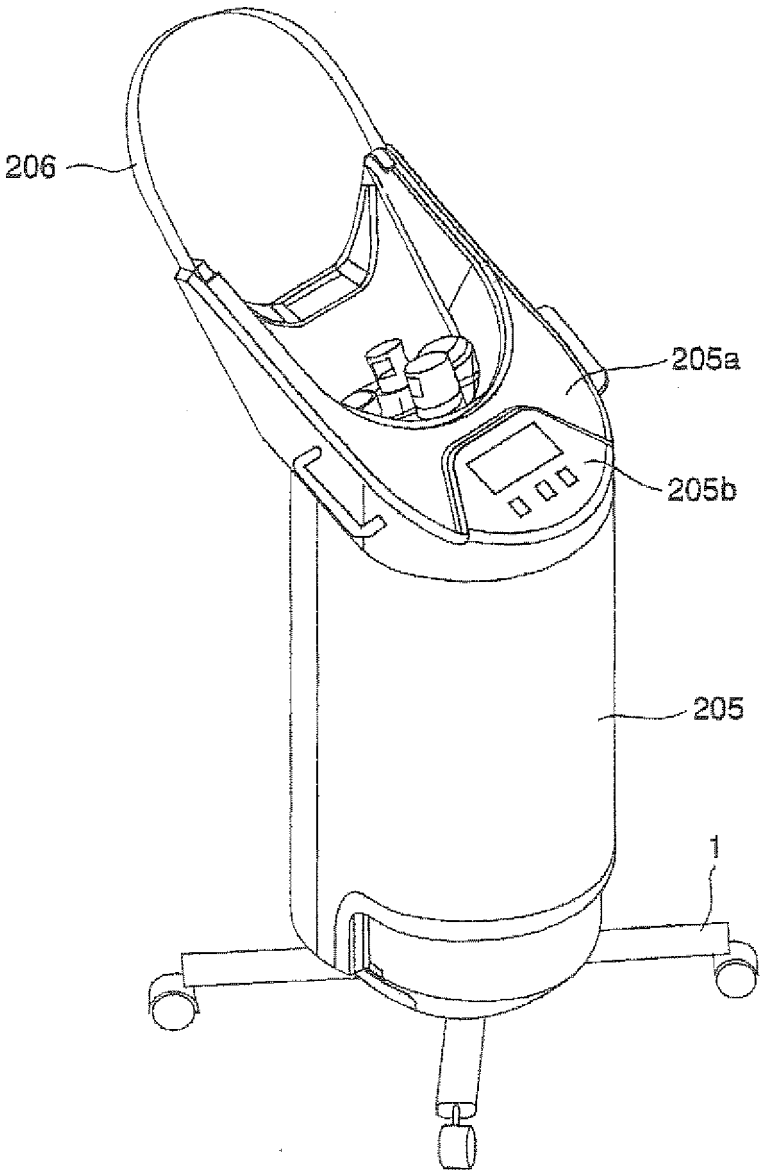


FIG.12

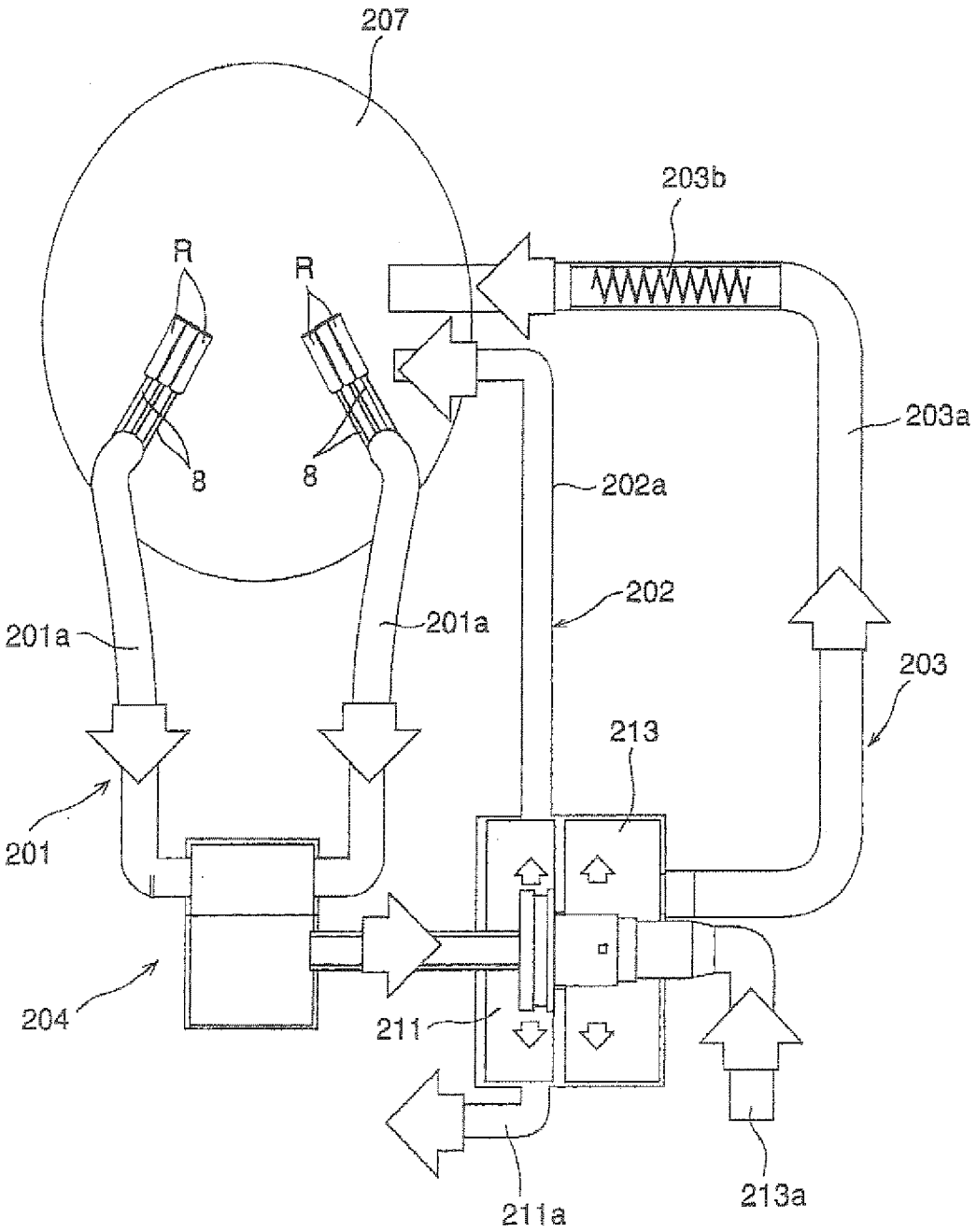

207
203b
R
R
8
8
203a
202a
202
201a
201a
203
213
201
204
211
211a
213a

FIG.13

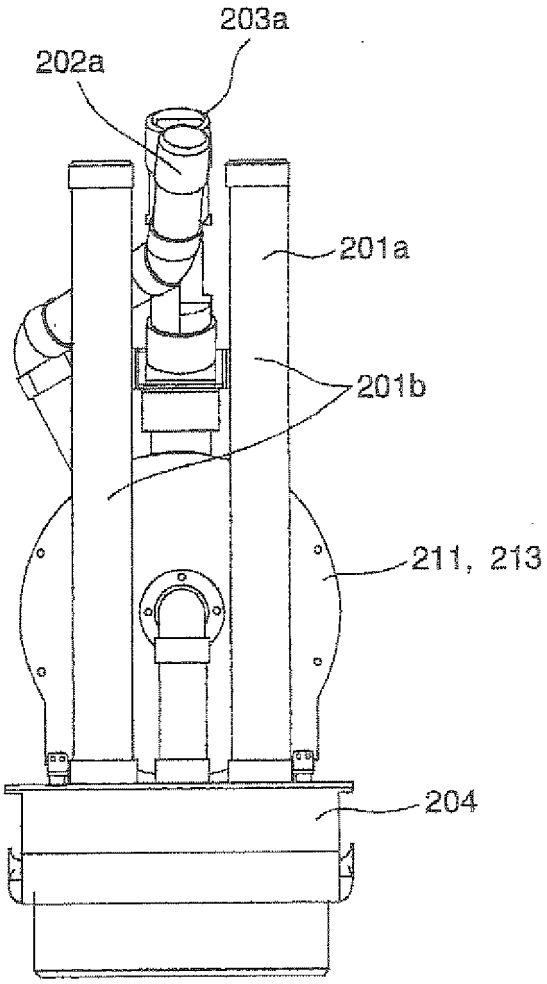


FIG.14

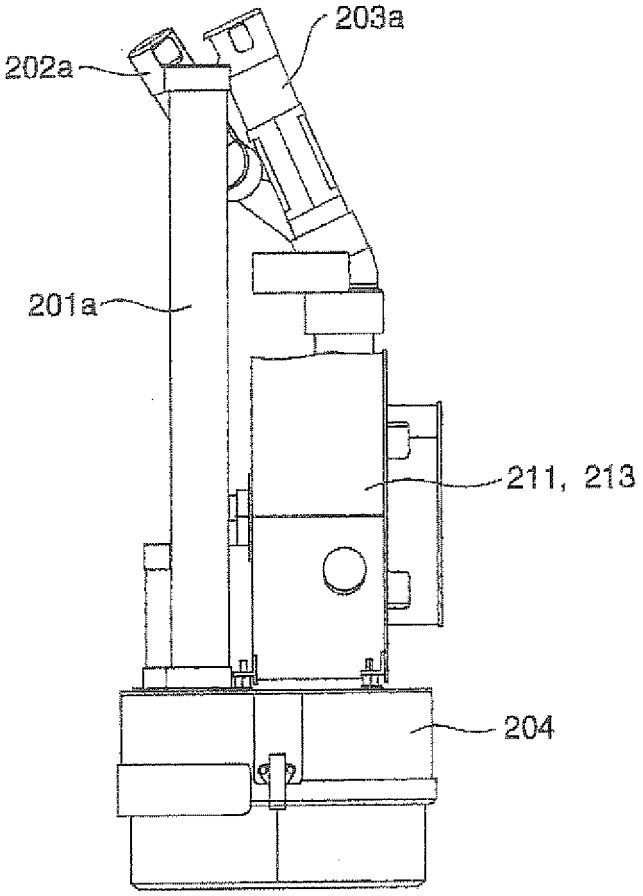


FIG.15

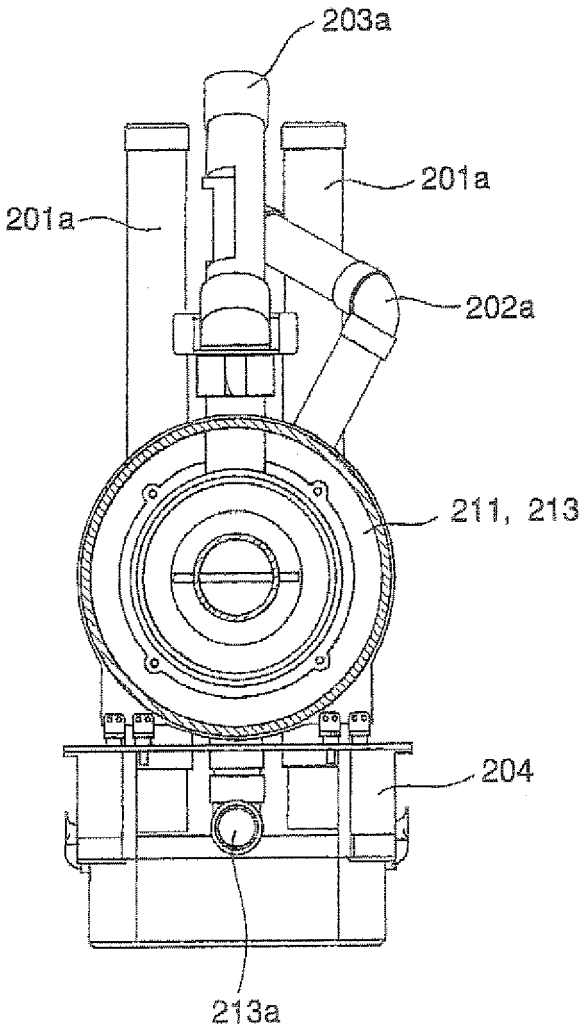


FIG.16

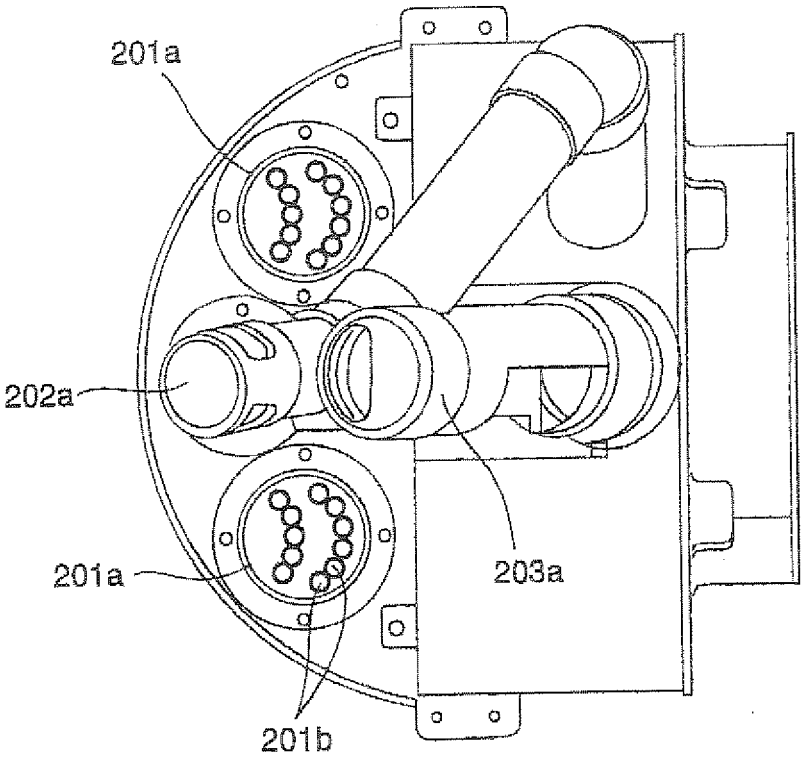


FIG.17

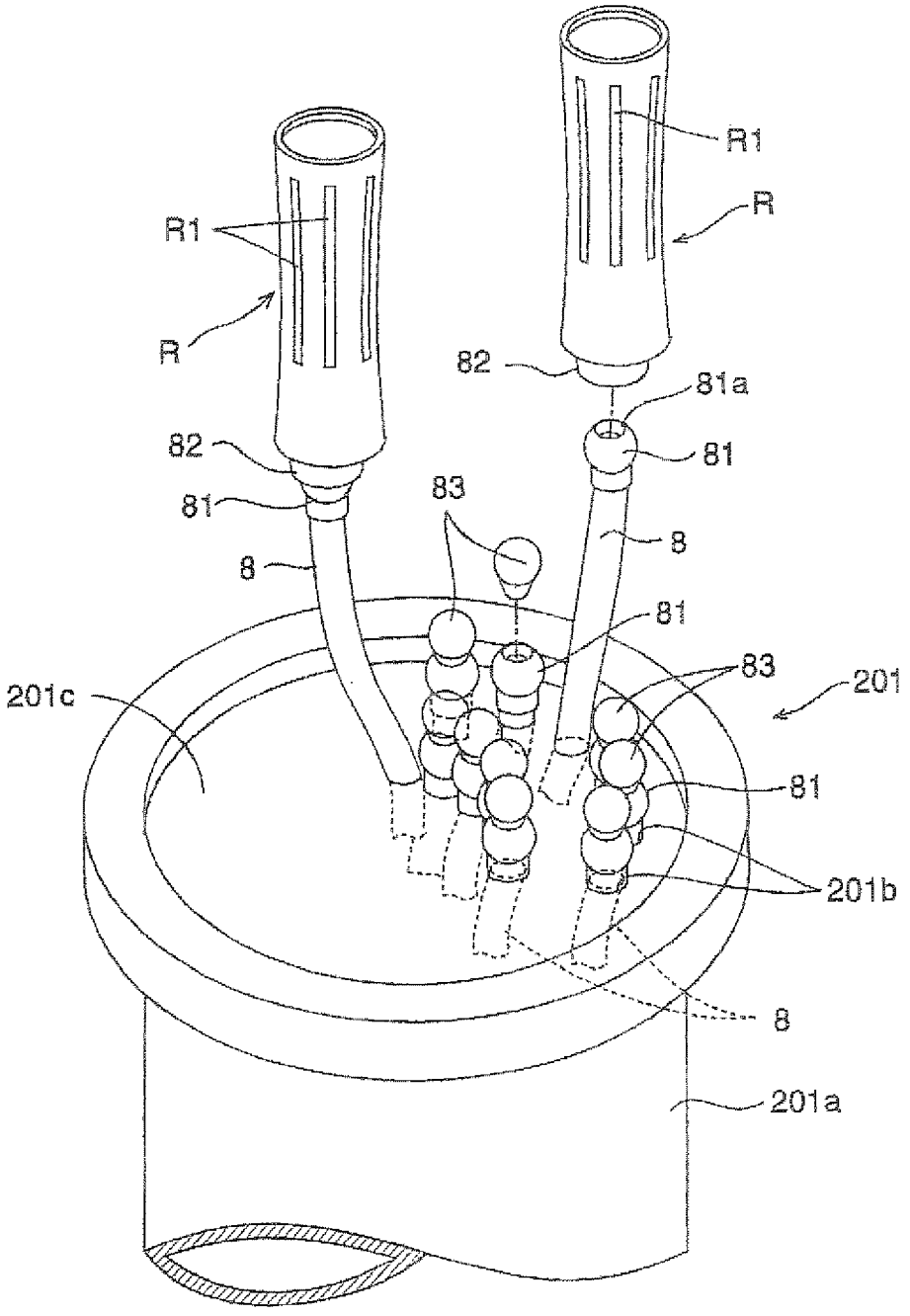


FIG.18

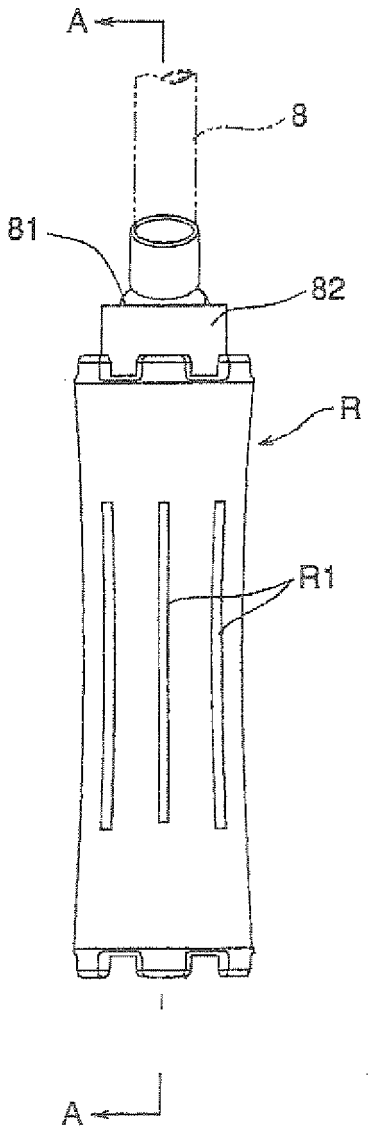


FIG.19

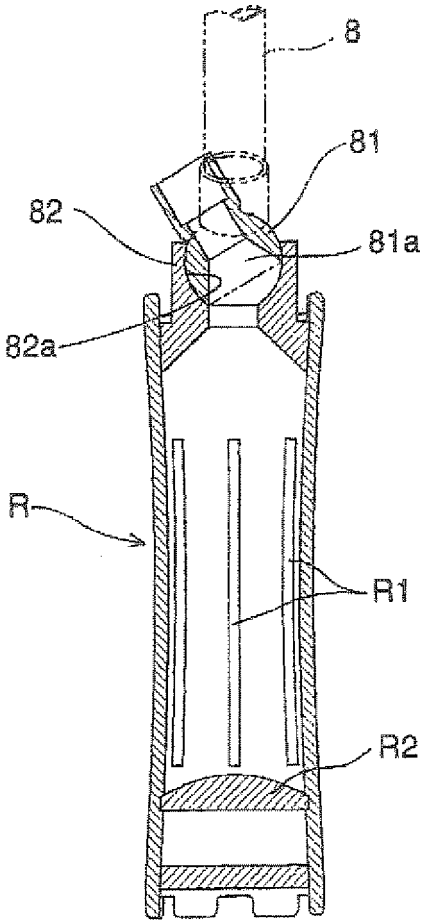


FIG. 20

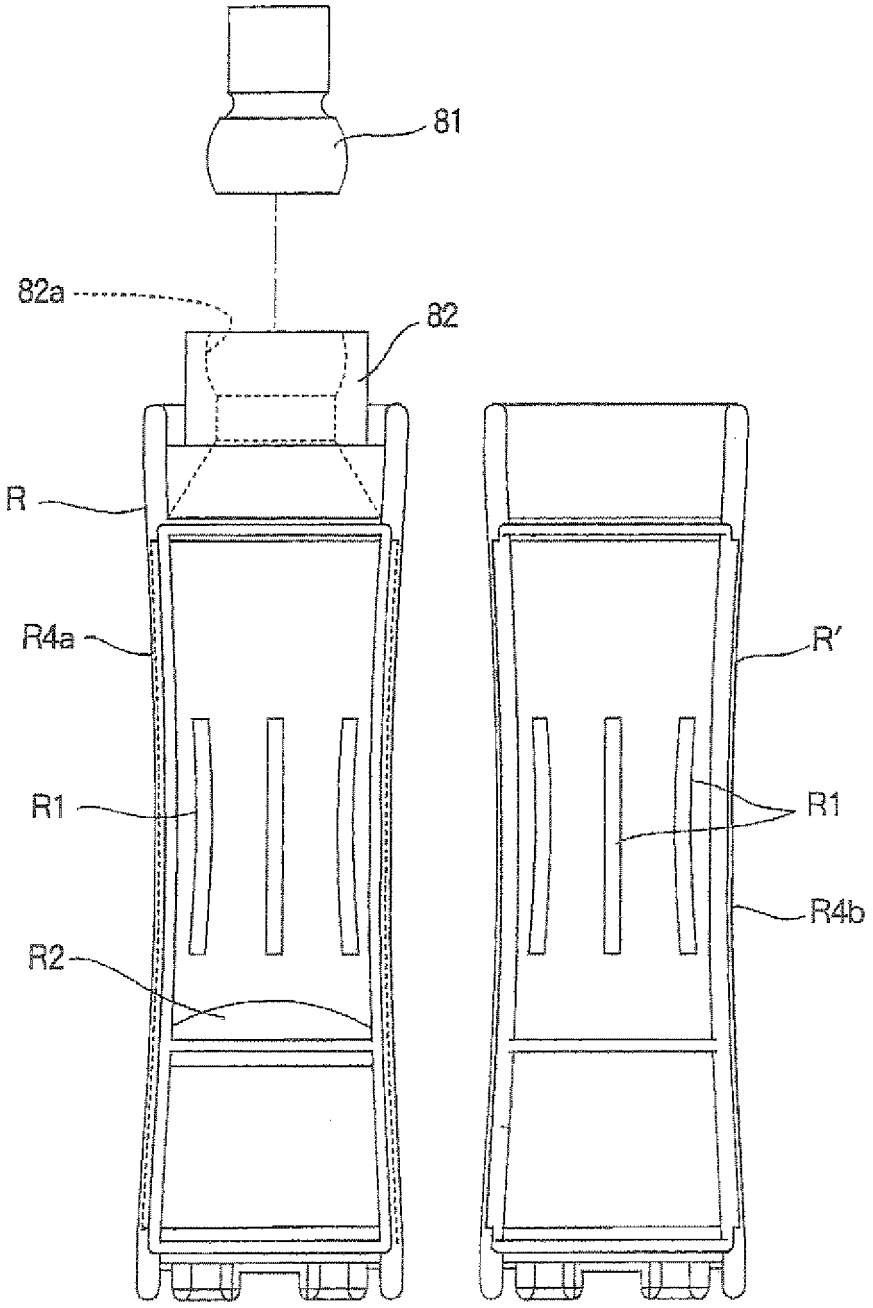


FIG.21

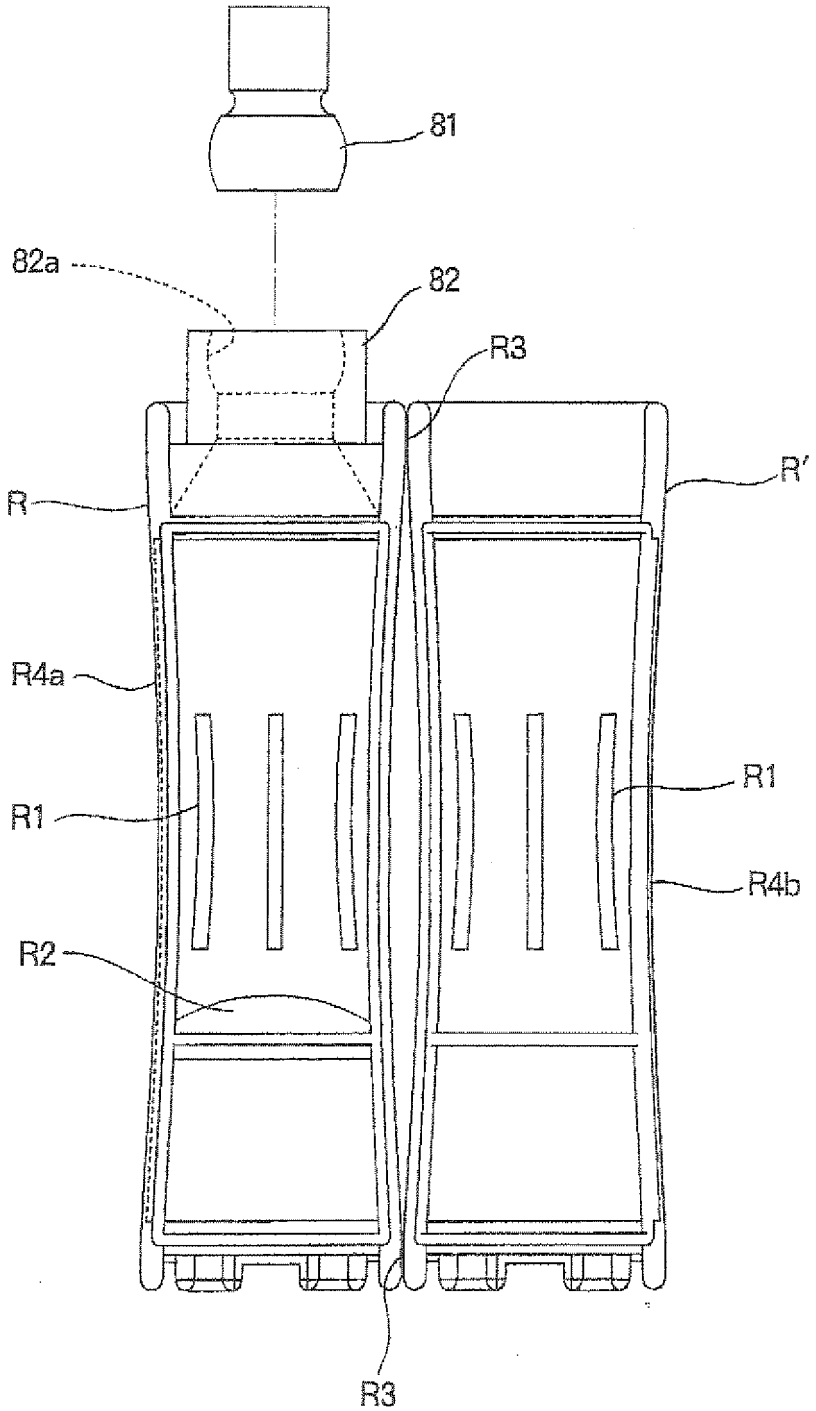


FIG. 22

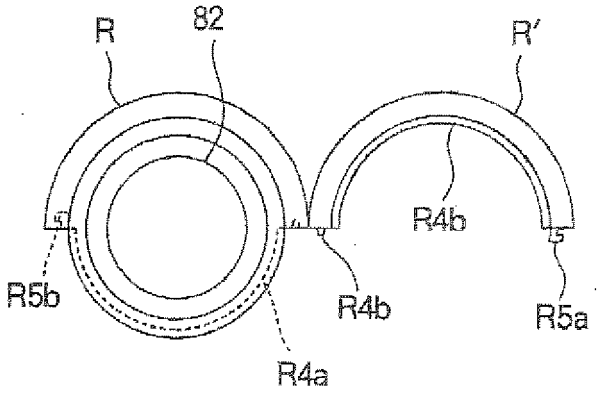
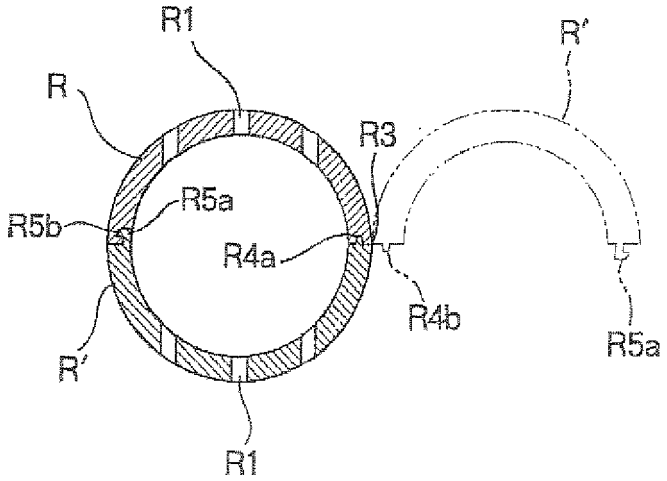


FIG. 23



INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/302209

A. CLASSIFICATION OF SUBJECT MATTER
A45D7/06(2006.01), ***A45D20/22***(2006.01)

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
A45D7/06, A45D20/22

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

Jitsuyo Shinan Koho	1922-1996	Jitsuyo Shinan Toroku Koho	1996-2006
Kokai Jitsuyo Shinan Koho	1971-2006	Toroku Jitsuyo Shinan Koho	1994-2006

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	JP 04-503915 A (BAUER, Rudolf), 16 July, 1992 (16.07.92), Full text; all drawings & WO 1990/010399 A1	1-20
Y	JP 53-82569 A (Sharp Corp.), 21 July, 1978 (21.07.78), Full text; all drawings (Family: none)	1-20

☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:
"A" document defining the general state of the art which is not considered to be of particular relevance
"E" earlier application or patent but published on or after the international filing date
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
"O" document referring to an oral disclosure, use, exhibition or other means
"P" document published prior to the international filing date but later than the priority date claimed
"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"&" document member of the same patent family

Date of the actual completion of the international search 06 March, 2006 (06.03.06)	Date of mailing of the international search report 14 March, 2006 (14.03.06)
Name and mailing address of the ISA/ Japanese Patent Office Facsimile No.	Authorized officer Telephone No.

Form PCT/ISA/210 (second sheet) (April 2005)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/JP2006/302209

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 161974/1977(Laid-open No. 87665/1979) (Tokyo Electric Co., Ltd.), 21 June, 1979 (21.06.79), Column 5, line 7 to column 6, line 3; Fig. 1 (Family: none)	5
Y	JP 38-6334 Y1 (Yoshimoto KOMATSU), 12 April, 1963 (12.04.63), Full text; all drawings (Family: none)	6,13
Y	Microfilm of the specification and drawings annexed to the request of Japanese Utility Model Application No. 168720/1976(Laid-open No. 88381/1978) (Matsushita Electric Industrial Co., Ltd.), 20 July, 1978 (20.07.78), Full text; all drawings (Family: none)	7-8,11-12
Y	JP 2004-415 A (Takara Belmont Co., Ltd.), 08 January, 2004 (08.01.04), Full text; all drawings & US 2003/0177571 A1	7-8
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