

[54] **FACIAL TREATMENT APPARATUS**

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[58] Field of Search..... **128/256, 367, 368, 128/173.2; 219/271, 273, 276; 4/168, 165**

[56] **References Cited**

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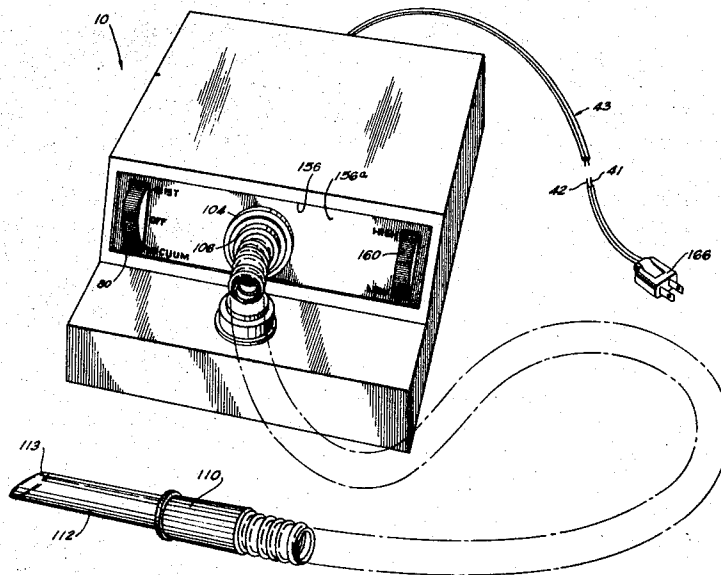
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Primary Examiner—Lawrence W. Trapp
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[57] **ABSTRACT**

A facial treatment apparatus having water vapor generating means and an applicator connectible through a flexible conduit to the steam generating means whereby the water vapor or a water mist may be applied to selected areas of the skin of the face, a blower, and control means for selectively connecting the outlet of the blower to the conduit, in order to add air to the water vapor being delivered to the applicator to vary the temperature of the water mist being applied to the face, or the inlet of the blower after the skin has been subjected to the mist whereby a suction may be applied to the areas of the skin encompassed by the applicator to remove fluids and extraneous matter from the surface of the skin and its pores.

6 Claims, 9 Drawing Figures



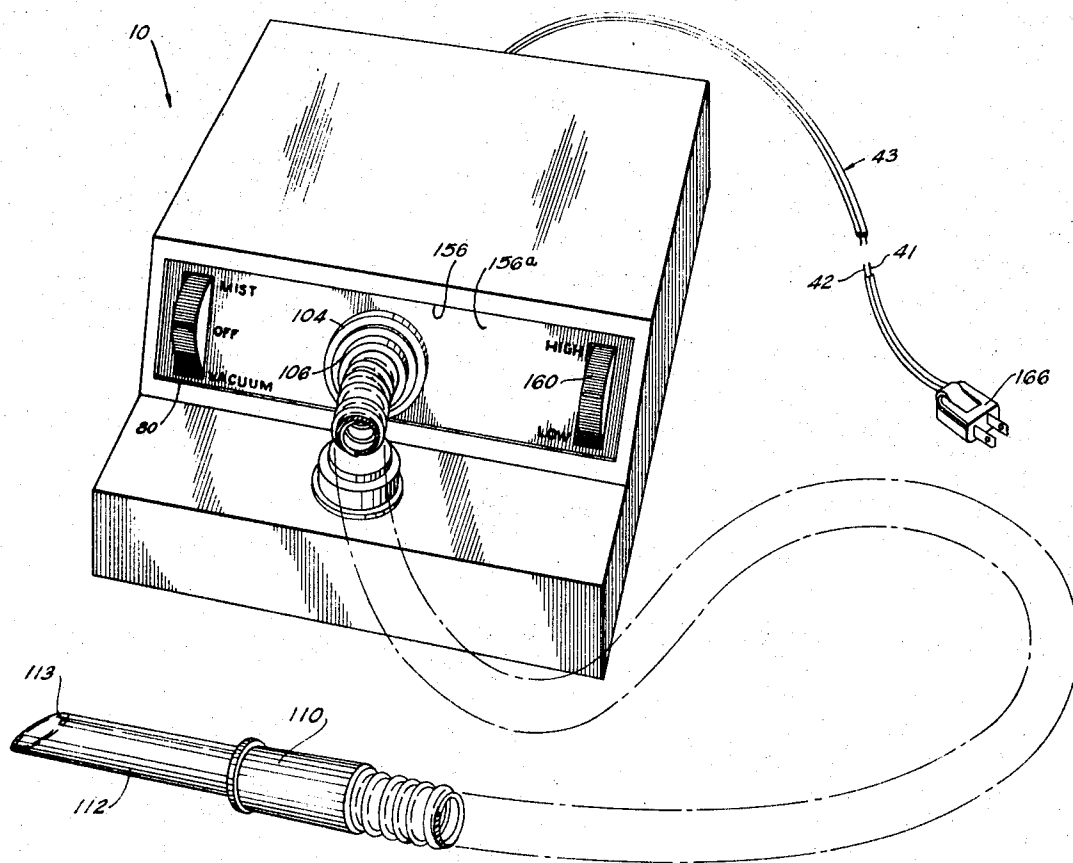


Fig. 1

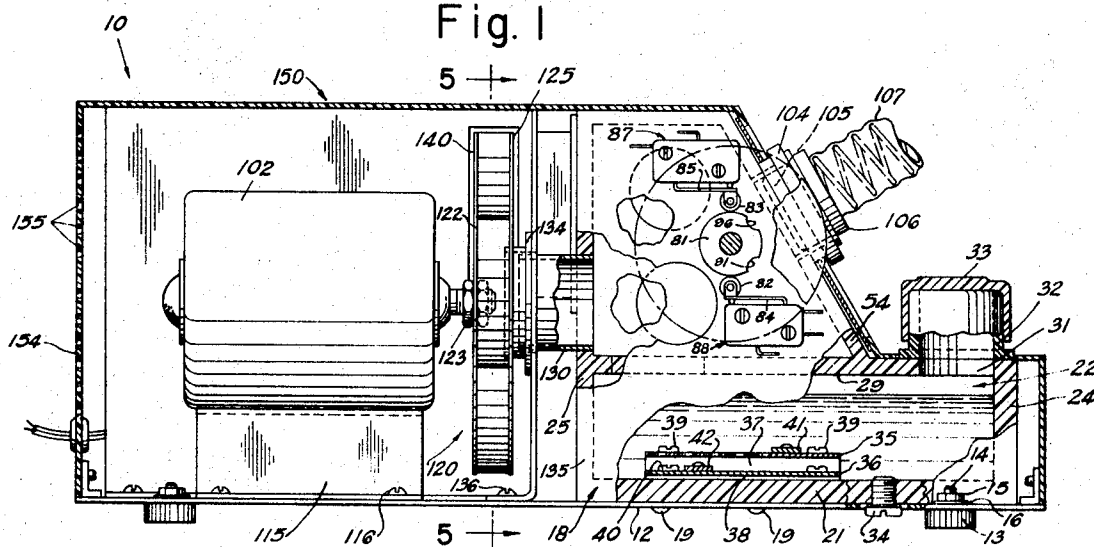
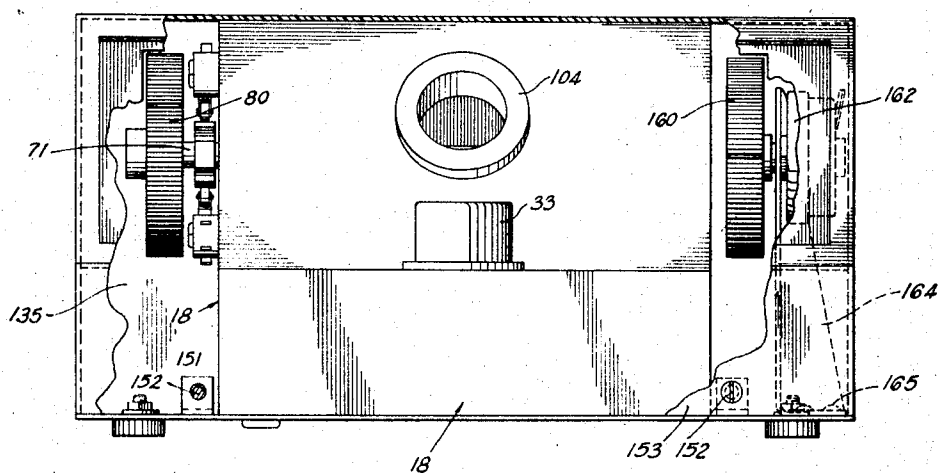
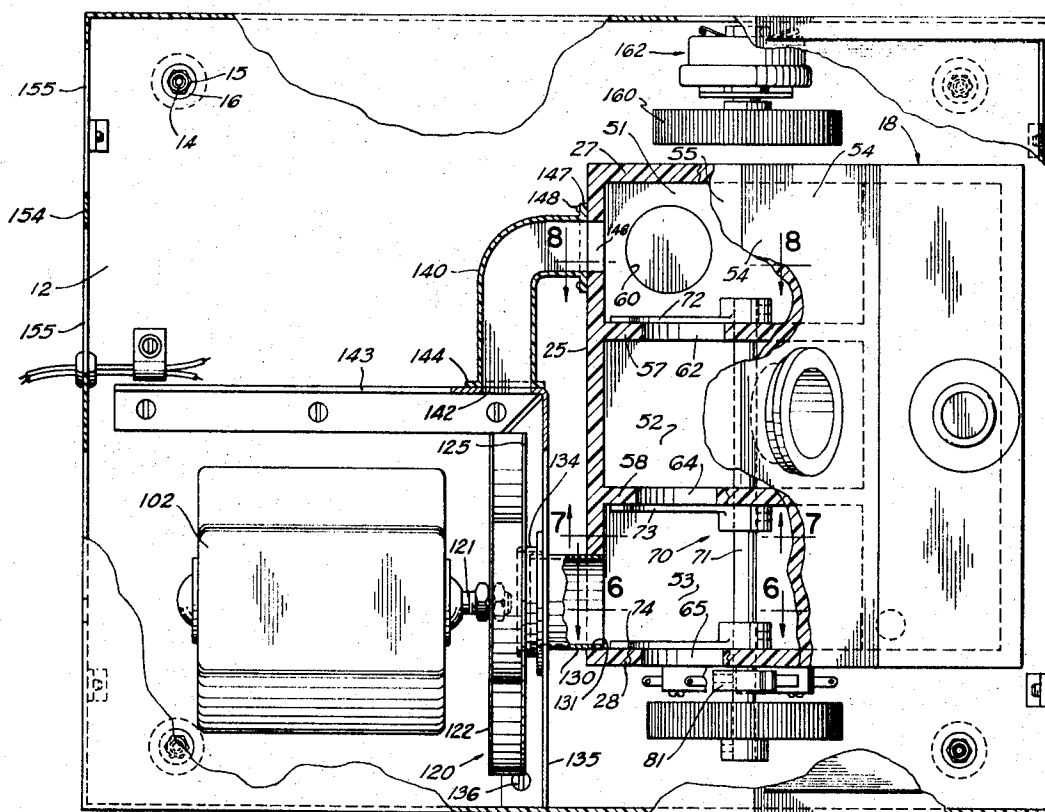


Fig. 2



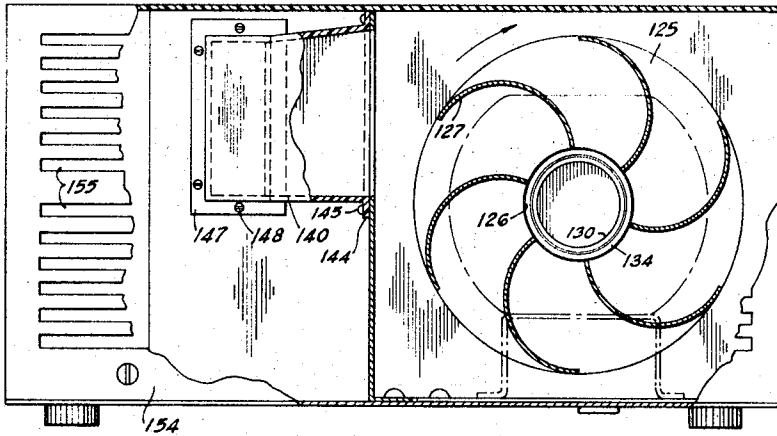


Fig. 5

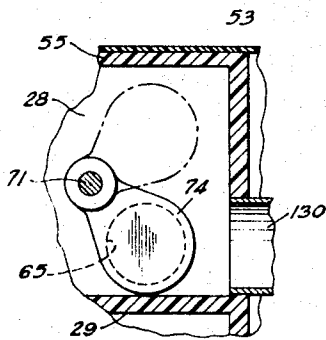


Fig. 6

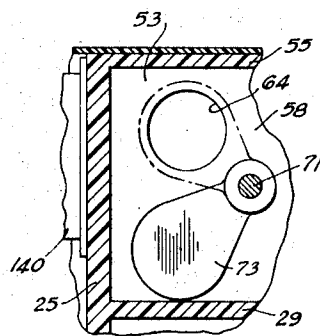


Fig. 7

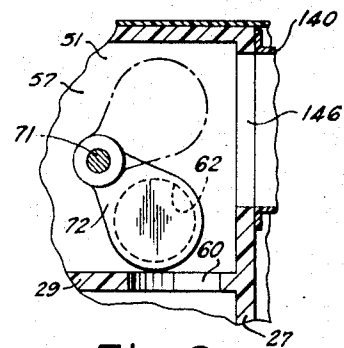


Fig. 8

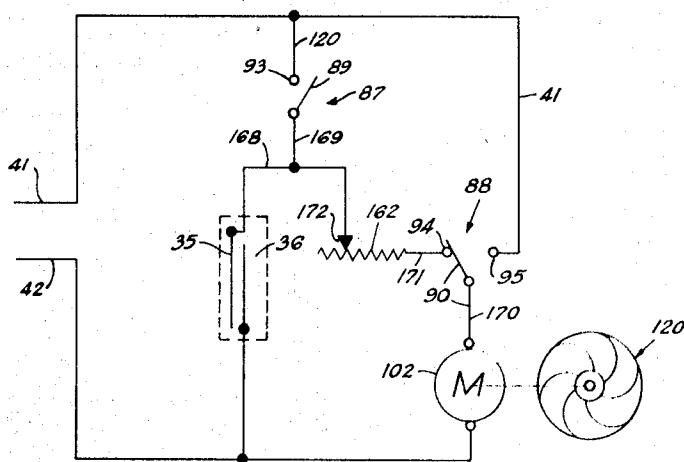


Fig. 9

FACIAL TREATMENT APPARATUS

This invention relates to a skin treatment apparatus and more particularly to a skin treatment apparatus for selectively subjecting selected areas of the skin to a hot water mist and to a partial vacuum to remove fluids and extraneous matter from selected areas of the skin.

An object of this invention is to provide a new and improved skin treatment having means for generating steam and for applying a hot water mist to selected small areas of the skin to open the skin pores, and thereafter reducing the pressure over the selected areas of the skin to remove extraneous matter from the surface and pores of the skin.

Another object is to provide an apparatus, of the type described, having electrically operable steam generating means, an electrically operable air mover, a substantially rigid applicator on the end of a flexible conduit, and control means for connecting the outlet of the blower to the conduit to permit mixing of the steam with the air being moved by the air mover and being delivered to the applicator by the conduit and alternately for connecting the inlet of the blower to the conduit whereby the pressure in the applicator is reduced.

Another object is to provide an apparatus, of the type described, which has means for controlling the rate of delivery of air to the conduit.

Additional objects and advantages of the invention will be readily apparent from the reading of the following description of an apparatus constructed in accordance with the invention, and reference to the accompanying drawings thereof, wherein:

FIG. 1 is a perspective view of the skin treatment apparatus embodying the invention;

FIG. 2 is a longitudinal sectional view, with some parts broken away, of the apparatus;

FIG. 3 is a top view of the apparatus, with some parts broken away and some shown in section;

FIG. 4 is a front end view of the apparatus with some parts broken away;

FIG. 5 is a partly sectional view taken on line 5-5 of FIG. 2;

FIGS. 6, 7 and 8 are sectional views taken on lines 6-6, 7-7 and 8-8, respectively of FIG. 3; and,

FIG. 9 is a diagrammatic illustration of the electric control circuit of the apparatus.

Referring now particularly to the drawings, the facial or skin treatment apparatus 10 of the invention includes a substantially rectangular base plate 12, which is supportable on a flat surface by a plurality of feet 13 provided with upwardly extending threaded studs 14 which extend through suitable apertures in the base plate and are secured thereto by nuts 15 and washers 16.

A housing 18 is mounted on the front portion of the base plate and is secured thereto by means of screws or bolts 19 which extend through suitable apertures of the base plate into downwardly opening threaded bores of the bottom wall 21 of the housing 18. The housing 18 for clarity of illustration has been shown as a single piece formed of a plastic or other substance having low heat conductivity but in practice may be formed of several sections which are bonded or otherwise secured to one another.

The housing provides a steam generating chamber 22 which extends the full length of the housing and is defined by a bottom wall 21, front and rear vertical walls 24 and 25, end walls 27 and 28 and a horizontal inter-

mediate wall 29. The rectangular chamber 22 may be filled with water through an aperture 31 in the front portion of the intermediate wall 29. A tubular neck or filler member 32 is secured to the top surface of the wall 29 by an adhesive, bonding agent or the like. A closure cap 33 is telescopic over the filler member 32 and is held thereon by frictional engagement therewith. The bottom wall may be provided with a threaded drain aperture which is closed by a plug 34.

The water in the chamber 22 is heated by the passage of current through the water from one plate electrode 35 to a second plate electrode 36 spaced and insulated from the electrode 35. The electrodes are mounted by suitable electrically insulating blocks 37 and 38 and screws 39 and 40 to the housing bottom wall 21. The terminals on the ends of the two conductors 41 and 42 of a two conductor cable 43 are secured to the electrodes 36 and 37 by rivets. The cable extends through a suitable aperture in the side wall 25 and a suitable grommet or other means may be used to seal between the side wall and the cable. The insulation of the cable, of course, is water proof.

The housing above the horizontal wall 29 provides three chambers 51, 52 and 53 which are defined by the upper portion of the rear wall 25, an upwardly and rearwardly sloping wall 54, a top wall 55, the upper portions of the side walls 27 and 28 and two partitions 57 and 58. The steam or water vapor generated in the chamber 22 may flow upwardly to the chamber 51 through a port 60 in the intermediate horizontal wall 29 and from the outer chamber 51 to the middle chamber 52 through a port 62 of the partition 57. The partition 58 is provided with a similar port 64 which provides communication between the middle chamber 52 and the other outer chamber 53 while the end wall 28 has a port 65 which opens to the outer chamber 53.

A valve assembly 70 for selectively opening and closing the ports 62, 64 and 65 includes a shaft 71, journaled in the partitions 57, 58 and the end wall 28, and three valve members 72, 73 and 74 whose hubs are telescoped on the shaft and rigidly secured thereto in any suitable manner as by means of set screws.

A turn wheel 80 is rigidly secured to the shaft exteriorly of the housing for rotating the shaft to cause the valve members to selectively open and close the ports 62, 64 and 65 as will be explained below.

A cam 81 is also rigidly secured to the shaft, between the end wall 28 and the wheel 80. The peripheral surface of the cam is engaged with the rollers 82 and 83 mounted on the resilient arms 84 and 85, respectively, of switches 87 and 88, respectively. The contacts 89 and 90 of the switches 87 and 88, respectively, are normally in the positions indicated in FIG. 9 when the rollers are in the positions relative to the cam 81 illustrated in FIG. 2. The contact 89 moves to its closed position when the shaft is rotated to move the recess 91 of the cam into alignment with the roller 82, while the contact 90 moves from the position illustrated in FIG. 9, where it engages its stationary contact 94, to the position where it engages its stationary contact 95 when the shaft is rotated to move the recess 96 of the cam into alignment of the roller 83. The switches may, of course, be secured to the side wall by screws and the like.

As will be explained below, the switch 87 controls the connection of the electrodes across an input circuit and the switches 87 and 88 control the energization of an electric motor 102.

The upwardly sloping wall 54 of the housing has a port which opens to the middle chamber 52 and a tubular socket 104 is mounted, as by a bonding agent, an adhesive or the like. The reduced tubular portion 105 of a fitting 106 is insertable in the socket and has one end of a flexible conduit 107 connected thereto. The free end of the conduit is provided with a tubular fitting or socket 110 into which is insertable an applicator 112. The applicator 112 is tubular and has a substantially oval end surface 113 which is adapted to slide or glide over the skin. If desired, the end surface 113 of the applicator may be provided with grooves or serrations for a purpose to be described.

The electric motor 102 is secured to a suitable mount 115 which is in turn secured to the base plate by the screws 116. A blower or air mover 120 is rigidly secured to the drive shaft 121 of the motor, the drive shaft extending through a central aperture in the inner circular side plate 122 of the air mover and secured thereto by a nut 123 threaded on the drive shaft on opposite sides of the side plate. The air mover includes an outer circular side plate 125 which has a central aperture 126 and a plurality of arcuate veins 127 which curve outwardly from their inner ends at the edge of the aperture 126 to the periphery of the side plates.

It will be apparent, of course, that as the air moving means is rotated in the direction indicated by the arrow in FIG. 5, air will be drawn inwardly through the aperture 126 and expelled outwardly at the periphery of the blower. The inlet aperture of the air mover is in communication with the chamber 53 through an inlet conduit 130 secured in a suitable aperture 131 of the housing rear wall 25 whose rear end extends into an adaptor 134 mounted on a bracket 135 secured to the base plate by screws 136. The bracket of course is provided with an aperture through which the inlet conduit 130 extends into the adaptor. The adaptor 134 may be secured to the bracket 135 by screws or the like and has a reduced portion of substantially the same diameter as the diameter of the inlet aperture 126 and projects inwardly therethrough.

It will therefore be apparent that as the air mover or blower is rotated, the pressure within the chamber 53 is decreased and air is moved outwardly at the periphery of the blower. A portion of the air being moved by the blower is directed to a conduit 140 whose inlet end is in alignment with an aperture 142 of a bracket 143. The conduit 140 is secured to the bracket by means of its flange 144 and screws 145. The other outlet end of the conduit 140 is secured to the housing rear wall 25, at the location of an aperture or an inlet port 146 of the rear wall which opens to the chamber 51, by its flange 147 and screws 148.

It will thus be apparent that the blower will tend to move air into the conduit 140 and thence through the conduit 140 into the chamber 51.

A cover 150 is secured to the base plate by means of angle brackets 151 secured, as by welding, to the base plate and screws 152 which extend through suitable apertures in the front and rear wall portions 153 and 154 of the cover. The rear wall portion is provided with slots 155. The particular configuration of the cover may be varied as desired to provide a desired ornamental appearance to the apparatus. The cover at its front portion has a window or opening 156 at the location of the upwardly and rearwardly sloping wall 54 of the housing 18 and an ornamental plate 156, secured to the

wall 54, closes the window. The plate is provided with suitable apertures at the locations of the wheel 80, the socket 104 and a wheel 160 of a rheostat or variable resistance 162. The rheostat 162 is mounted on a bracket 164 whose lower end is rigidly secured to the base plate by means of screws 165.

Referring now particularly to FIG. 9 of the drawings, the conductors of the two conductor cable 43 terminate at the usual plug 166 by means of which the conductors may be connected to opposite sides of an electric supply system. The electrode 36 is connected to the conductor 42 by a conductor 117 while the other electrode 35 is connectible to the conductor 41 through the conductors 168 and 169, the switch contact 89 when it is moved to its closed position engaging its stationary contact 93 and a conductor 120. The motor 102, when the movable contact 90 of the switch 80 is in the position illustrated in the drawing engaging its stationary contact 94, is connectible across the conductors 41 and 42 through the conductor 170, the movable contact 89 of the switch 87, the conductor 171, the resistance 162, the movable contact 172 of the rheostat, the conductors 168 and 169, the switch contact 87 and the conductor 120. When the switch is moved to its other opposite position wherein its movable contact 90 engages the stationary contact 95, the motor is connected directly across the conductors 41 and 42 by the conductor 170.

It will be apparent that the speed of operation of the motor, and therefore the speed of rotation of the blower, will vary in accordance with the value of the resistance 162 as determined by the position of the movable contact 172 thereon and therefore the speed of the motor may be varied by adjusting the position of the movable contact 172 by means of the wheel 160.

When the skin of an operator is to be treated by use of the apparatus 10, the chamber 22 is filled with water through the filler 32 and the closure cap 33 is then placed on the filler member 32.

The fitting 106 of the flexible conduit 107 is then inserted into the socket 104 and an applicator 112 is inserted into the socket 110 at the free end of the conduit. The wheel 80 is then rotated from the "off" position to the "mist" position. As the shaft 71 is thus rotated, as seen in FIG. 2, in a counter-clockwise direction to the position wherein the cam recess 96 of the cam 81 moves into registry with the follower 83, the normally open contact 89 of the switch 87 moves into engagement with its stationary contact 93. As a result, electric current will now flow through the water in the chamber 22 between the two electrodes 35 and 36 heating the water and causing it to boil and evaporate. Simultaneously, the motor 102 is energized so that the air mover 120 is now rotated.

This movement of the shaft 71 causes the valve member 74 to be rotated upwardly to the open position illustrated in broken lines in FIG. 6, thus opening the port 65 so that air will be drawn from the exterior of the housing through the port 65 into the chamber 53 and then through the blower and outwardly at its periphery. It will be apparent that the peripheral portion of the blower and the spaces between the adjacent vanes 127 may be regarded as the outlet of the blower. A portion of the air being moved by the blower is of course directed at the inlet of the conduit 150. Such movement of the shaft 71 also moves the valve member 73 to its closed position illustrated in broken lines in FIG. 7.

wherein it closes the port 64 and moves the valve member 72 to its open position, illustrated in broken lines in FIG. 8, wherein the port 62 is open.

As a result, air is drawn inwardly through the port 65 and a portion thereof is moved through the conduit 140 into the end chamber 51 where it mixes with the water vapor or steam flowing upwardly into the chamber 51 from the boiler chamber 22 through the port 60. The steam or water vapor now condenses to a fine mist or droplets as the temperature of the vapor drops as it mixes with the air which is at room temperature.

This mist, i.e., mixture of hot water droplets and air, now flows with a certain desired velocity and at a desired temperature, as determined by the speed of operation of the air mover, through the port 62 into the middle chamber 52 and, since the port 64 is now closed, into the flexible conduit. The stream of mist flows out of the applicator at a desired velocity and temperature as determined by the value of the resistance of the rheostat and is caused to impinge on a small area of the skin determined by the internal diameter of the applicator and the distance of the end surface 113 of the applicator from the skin. As a result, the area of the skin subjected to this stream of mist is heated and treated with the warm water droplets and is also subjected to the mechanical force of the mist which tends to dislodge extraneous matter from the surface of the skin. The pores of the skin now tend to open, the skin being moistened and heated by the mist. The warm water droplets, also moistened, tend to dissolve any dirt, powder or extraneous matter adhering to the skin, thus decreasing the force with which such matter clings to the skin.

After a desired area of the skin has been subjected to this stream of mist, the wheel 80 is rotated in a clockwise direction, as seen in FIG. 2, and as the recess 96 first moves out of registry with the roller 82, the movable contact 89 of the switch 87 opens so that the electric current no longer flows through the water between the electrodes 35 and 36, thus stopping heating of the water, and subsequently the recess 91 of the cam 81 moves into registry with the roller 83. As a result, the movable contact 90 of the switch 88 moves into contact with the stationary contact 95 thus connecting the motor 102 directly across the conductors 41 and 42. The speed of operation of the motor 102 will now be maximum. Such clockwise rotation of the shaft 71 now causes the three valve members 74, 73 and 72 to move to the positions illustrated in full lines in FIGS. 6, 7 and 8, respectively, so that the ports 65 and 62 are closed while the port 64 is open. The inlet of the air mover means 120 is not in communication only with the chamber 53 and the middle chamber 52 thus creating a pressure drop within the chambers 52 and 53 and therefore, with the interior of the flexible conduit. Air now tends to flow inwardly through the applicator 112 and if the surface 113 is now applied against the skin, the area of the skin enclosed by the end surface 113 will be subjected to a decreased pressure or suction thus tending to cause the dirt particles, oil or the like in the open pores to be moved outwardly onto the surface of the skin and also the loosened matter on the skin to be dislodged from the surface of the skin as the applicator edge moves thereover. There is, of course, some slight flow of air between the applicator edge surface 113 and the skin so that the flow of air tends to move the particles, liquids, oils or other matter present

on the surface of the skin off the skin and through the conduit 110. As was explained above, the end surface 113 may be serrated to provide a scraping action over the skin while permitting some flow of air between the skin and the end surface at a relatively high velocity which would tend to mechanically dislodge extraneous matter present on the skin.

It will now be seen that the illustrated and described applicator 10 employs a single air moving means for selectively varying the velocity and temperature of the hot water mist being delivered through the applicator and also to provide a decreased pressure or suction at the applicator for decreasing the pressure at the surfaces of the skin and for removing extraneous matter such as liquids, oils and dirt particles off the skin after the skin has been subjected to the hot water mist.

It will also be apparent that, if desired, suitable cosmetic, cleanser or medicating agents could be introduced into the water in the boiler chamber 22 so that the hot water mist will not be a pure water mist but would also contain such agent which would evaporate with the water and be applied to the skin at the time it is being subjected to the stream of hot water mist.

The foregoing description of the invention is explanatory only, and changes in the details of the construction illustrated may be made by those skilled in the art, within the scope of the appended claims, without departing from the spirit of the invention.

What is claimed and desired to be secured by Letters Patent is:

1. An apparatus for treating skin including: generator means for boiling water to produce water vapor; a tubular applicator having an outlet end engageable with the skin; air mover means having an inlet means and an outlet means; and flow control means for selectively connecting said generator means to said applicator whereby the applicator may deliver water vapor to a selected area of the skin and to said inlet means whereby the air pressure at said outlet end of said applicator may be reduced.

2. The apparatus of claim 1, wherein said flow control means connect said applicator to said outlet means at the same time it connects said applicator to said generating means.

3. The apparatus of claim 2, and means for varying the rate of flow of air to said applicator.

4. The apparatus of claim 3, and means operatively associated with said flow control means for simultaneously energizing said air mover means and said steam generating means when the skin is to be treated with a mist of water droplets and for energizing said air mover means only when a reduced air pressure is to be provided at said applicator outlet end.

5. The apparatus of claim 1, wherein said apparatus includes a housing providing a boiler chamber, first and second spaced end chambers and a middle chamber between said end chambers, said generator means comprising spaced electrodes in said boiler chamber, first and second port means for providing fluid communication between said middle chamber and said first and second end chambers, respectively, said applicator having an inlet means in fluid communication with said middle chamber, said first end chamber having third port means in fluid communication with the top of said boiler chamber and fourth port means in fluid communication with said outlet means of said air moving means, said second end chamber having fifth port

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means in fluid communication with the exterior of said housing and a sixth port means in fluid communication with said inlet means of said air moving means, said flow control means including valve means for selectively closing said first, second and fifth port means, and operator means for said valve means for simultaneously causing said valve means to open said first and fifth port means and to close said second port means when said operator means is in a first operative position and to close said first and fifth port means when said

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operator means is in a second operative position.

6. The apparatus of claim 5, and an electric motor for energizing said air mover means, switch means for connecting said electrodes and said motor across an input circuit, said operator means when in said first position causing said switch means to connect both said motor and said electrodes across the input circuit and when in said second position causing said switch means to connect only said motor across the input circuit.

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