

July 21, 1942.

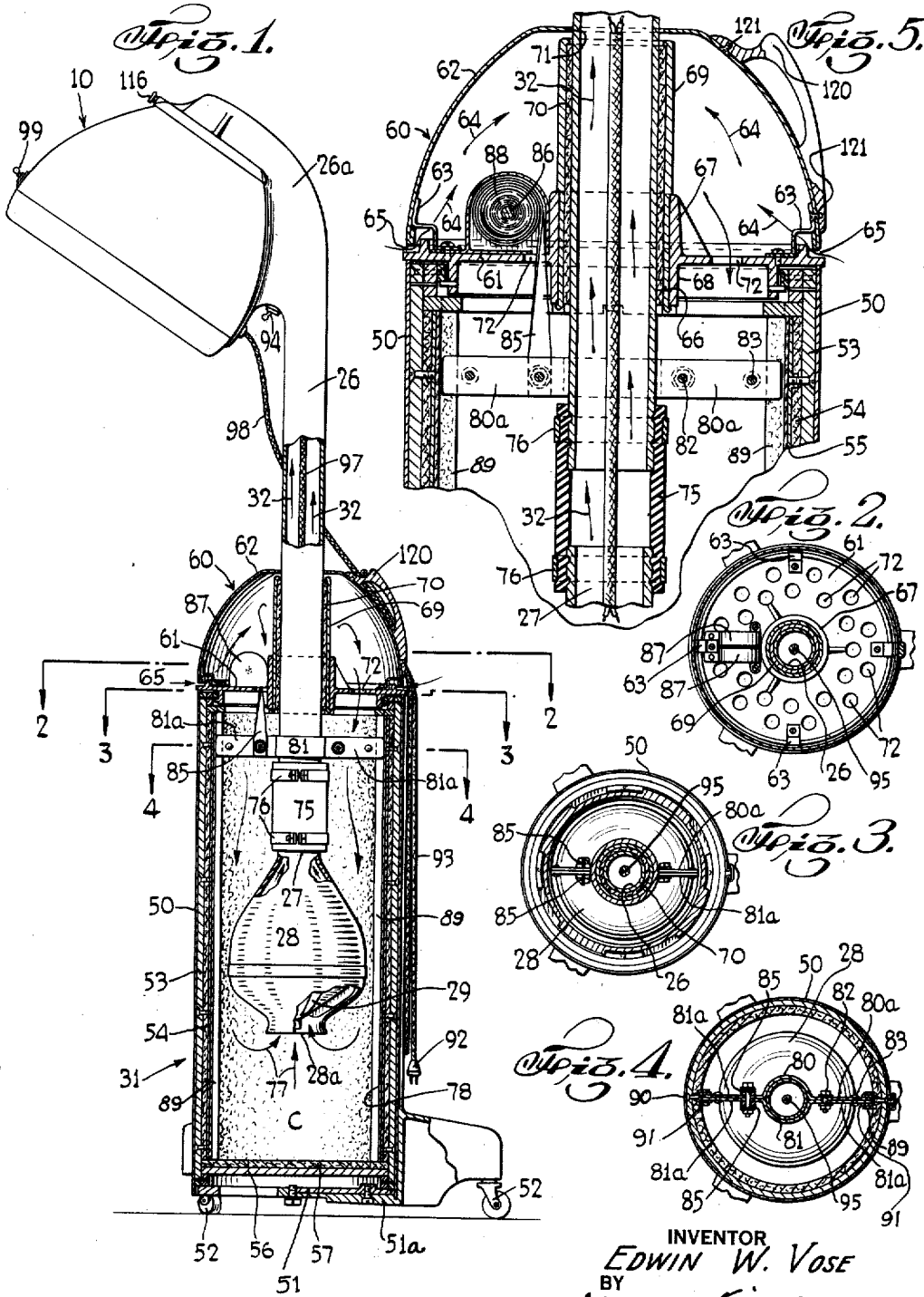
E. W. VOSE

2,290,259

HAIR DRYING APPARATUS

Filed Nov. 7, 1939

3 Sheets-Sheet 1



INVENTOR
EDWIN W. VOSE
BY
H. J. Finkelman
ATTORNEY

July 21, 1942.

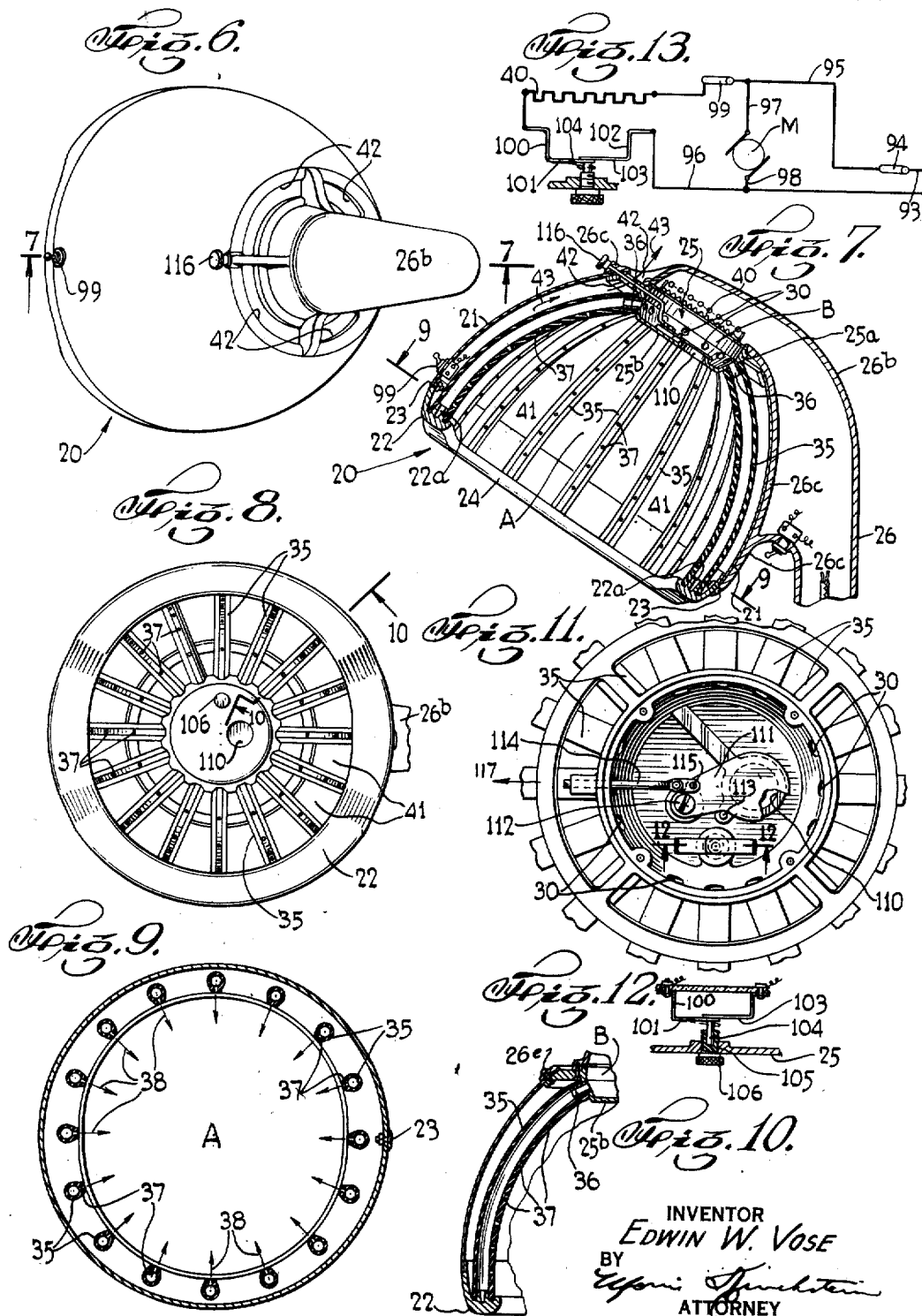
E. W. VOSE

2,290,259

HAIR DRYING APPARATUS

Filed Nov. 7, 1939

3 Sheets-Sheet 2



INVENTOR
EDWIN W. VOSE
BY
Eugene J. Spink
ATTORNEY

July 21, 1942.

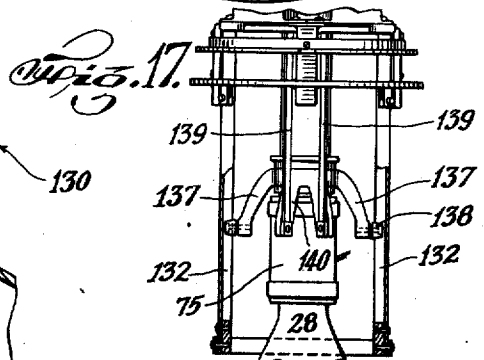
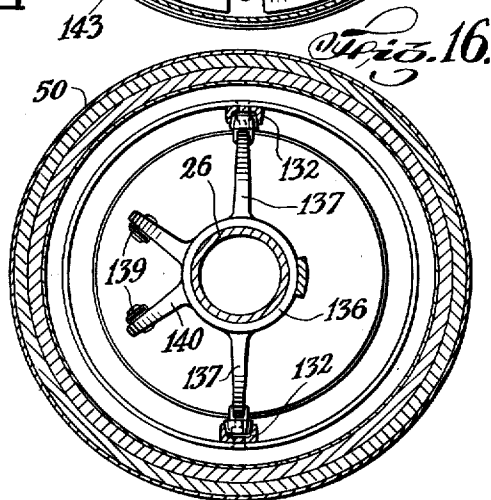
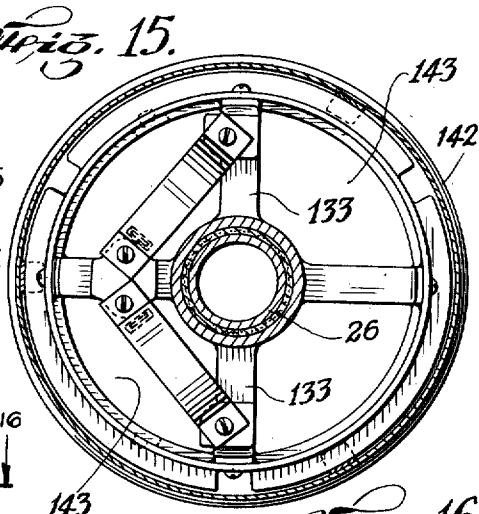
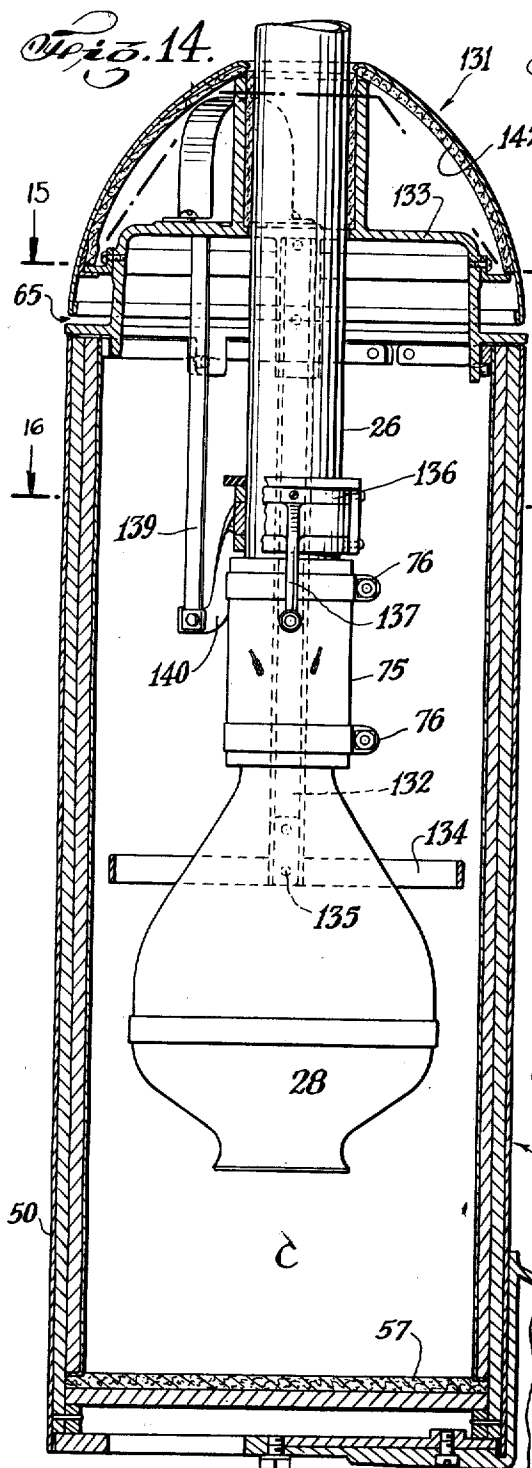
E. W. VOSE

2,290,259

HAIR DRYING APPARATUS

Filed Nov. 7, 1939

3 Sheets-Sheet 3



INVENTOR
EDWIN W. VOSE
BY
Edwin W. Vose
ATTORNEY

UNITED STATES PATENT OFFICE

2,290,259

HAIR DRYING APPARATUS

Edwin W. Vose, Orange, N. J.

Application November 7, 1939, Serial No. 303,179

3 Claims. (Cl. 34—99)

This invention relates to hair dryers. More particularly, my invention relates to an improved construction for hair drying apparatus adapted for use in beauty parlors.

One of the objects of my invention is to provide a hair drying apparatus of the character described which shall be designed for use as a portable unit and which shall include novel means for supporting the blower mechanism for supplying heated air to the drying chamber of the dryer.

Another object of my invention is to provide a hair drying apparatus of the character described having novel means for causing the air to flow in a continuous path by first forcing the air to pass between the strands of hair until it reaches the scalp, after which it flows out again between the strands of hair, to thoroughly dry the hair throughout, and in which means are provided for delaying the exhausting of the air until it has absorbed a full quota of moisture, so that hair drying may be efficiently accomplished.

Still another object of my invention is to provide a hair drying apparatus of the character described in which novel means are employed whereby the passage of heated air, after use, downwardly about the face, neck and shoulders of the user, is substantially eliminated, thus increasing the comfort and safety of the said user.

A further object of my invention is to provide a hair drying apparatus of the character described, having novel means for adjustably maintaining the drying hood at any selected height, and in which the air compressing and distributing means are permanently connected to form a single unit and in such manner as to form an air tight passageway for the air delivered from the compressor to the drying hood.

Another object of my invention is to provide a novel hair drying apparatus of the character described which shall be so constructed as to be relatively quiet in operation.

A still further object of my invention is to provide a hair drying apparatus of the character described which shall possess structural features making it easy to assemble and to operate, which shall be rugged in construction and which at the same time shall represent a general improvement in the art.

Another object of my invention is to provide a hair drying apparatus of the character described, provided with means whereby the dryer may be additionally adapted for use as a blower

for cooling a permanent wave and for drying long hair.

Still another object of my invention is to provide a hair drying apparatus of the character described, provided with removably arranged air ducts designed to be replaced by other air ducts suited to different types of hair styles.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts which will be exemplified in the construction hereinafter described, and of which the scope of application will be indicated in the claims.

In the accompanying drawings, in which is shown one of the various possible embodiments of this invention,

Fig. 1 is a side elevational view, partly in section, of a hair dryer constructed in accordance with my invention;

Fig. 2 is a cross-sectional view taken substantially on the line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken substantially on the line 3—3 of Fig. 1;

Fig. 4 is a cross-sectional view taken substantially on the line 4—4 of Fig. 1;

Fig. 5 is an enlarged cross-sectional view of a portion of the apparatus shown in Fig. 1;

Fig. 6 is an enlarged top plan view of a portion of the device shown in Fig. 1;

Fig. 7 is a cross-sectional view taken substantially on the line 7—7 of Fig. 6;

Fig. 8 is a bottom plan view thereof;

Fig. 9 is a cross-sectional view taken substantially on the line 9—9 of Fig. 7;

Fig. 10 is a cross-sectional view taken substantially on the line 10—10 of Fig. 8;

Fig. 11 is a view similar to Fig. 8, but showing an enlarged portion thereof with additional valve operating mechanism;

Fig. 12 is a cross-sectional view taken substantially on the line 12—12 of Fig. 11;

Fig. 13 is a wiring diagram illustrating the operation of the air heater means;

Fig. 14 is a view similar to Fig. 5, but showing a modified form of my invention;

Fig. 15 is a cross-sectional view taken substantially on the line 15—15 of Fig. 14;

Fig. 16 is a cross-sectional view taken substantially on the line 16—16 of Fig. 14; and

Fig. 17 is a view of a portion of the apparatus shown in Fig. 14, but of reduced size and illustrating further constructional details.

Referring now in detail to the drawings, there

is disclosed a hair dryer constructed in accordance with my invention and comprising a drying hood 20 shaped to fit freely over the head and hair of the person undergoing treatment, in the manner well known to the art. The hood 20 comprises an annular wall 21, of such cross-sectional contour as to conform to the shape of a head of hair to be dried and surrounding a hair drying chamber A. The larger or outer end of the wall 21 is provided with a rim member 22 fixed to the wall 21 by the bolts 23, so that the said member 22 may be readily removed and replaced. The member 22 is provided with a central opening 24, communicating with the drying chamber A, and sufficiently large to permit the head of hair to freely pass therethrough. Attached to the smaller or inner end of the wall 21 by any suitable attaching means is a cup-shaped air distributor member 25. The said member 25 comprises an annular side wall 25a and a bottom wall 25b and is open at the top to provide an inlet passageway B for the air to be introduced into the drying chamber A through a plurality of circumferentially spaced apertures 30 disposed in the said side wall 25a, in the manner soon to be described. Communicating with the inlet passageway B is an air duct or conduit 26 leading from the discharge end 27 of a blower unit 28 comprising a fan 29 and electric motor M (not shown in Fig. 1, but shown diagrammatically in Fig. 13). The blower unit 28 is supported in a sound-proof cabinet 31. The manner of supporting the said blower unit 28 and the detailed construction of the cabinet 31 will be hereinafter described. The conduit 26 terminates at its upper end in an enlarged or flared portion 26b forming a plenum chamber. The hood 20 may be attachably supported by the conduit portion 26b by any suitable means, such as for example the rivets 26c shown in Fig. 10. It is noted that the duct 26 delivers air forced upwardly therethrough by the blower 28 into the passageway B, as shown by the arrows 32 in Figs. 1 and 5.

In accordance with my invention, the following novel construction is employed for forcing the air into effective contact with the hair to be dried within the drying chamber A. A plurality of ducts 35, circumferentially spaced from each other and radially disposed within the drying chamber A, are employed. Each duct 35 is fastened at one end thereof to the rim member 22 by frictionally fitting the same around a projection 22a on the said member 22 and in such manner as to close off the said duct end. The opposite end of each duct 35 is fastened to the member 25 by means of a hollow nipple 36 mounted in each aperture 30. It is noted that a duct 35 is provided to correspond with each aperture 30 and it is therefore seen that the air passing into the passageway B under pressure will be forced through the nipples 36 and into the ducts 35. Each of the ducts 35 is provided with a plurality of orifices 37 in the wall thereof, disposed in a direction toward and communicating with the drying chamber A, as clearly shown by the arrows 38 in Fig. 9 of the drawings, so that air from the ducts 35 will be forced into the drying chamber A.

Suitable means are employed for heating the air before feeding the same into the drying chamber A. For this purpose I employ an electrical heating element 40 which is disposed at the entrance to the air passageway B and in the path of the air forced by the blower unit 28

through the duct 26 so that the air is heated before passing into the ducts 35 and out through the orifices 37 to act upon the hair to be dried.

In order to provide for rapid drying of the hair, I have so arranged the ducts 35 as to provide spaces 41 between the said ducts 35 which are designed to act as expansion or low pressure chambers in which the air is rendered turbulent due to the action of the jets of air emerging from the orifices 37. This turbulent action of the air under reduced pressure greatly facilitates the rapid drying of the hair and provides for an efficient hair drying apparatus. It is also noted that the flared duct end 26b provides an area which permits the air to more leisurely pass over the electric heater 40 to thus insure that the air is sufficiently heated before its use.

It is thus seen that in the operation of my improved hair drying apparatus the heated air under pressure supplied to the ducts 35 passes out through the orifices 37 in a continuous flow in a direction toward the head of hair in the drying chamber A and continues on to pass between the strands of hair until it reaches the scalp, from whence it passes out again through the strands of hair, thus drying the hair throughout.

In the type of hair dryers heretofore employed, in which heated air is forced into contact with the hair within the drying chamber, it has been found that great discomfort and sometimes serious injury to the person under treatment resulted from the fact that all the heated and moisture laden air from the drying chamber was exhausted downwardly about the face, neck and shoulders of the user. In accordance with my invention, I have provided the following construction for overcoming the above described disadvantages: A vent opening 42 is provided in the hood 20 adjacent the air inlet passageway B to cause the heated air in the expansion chambers 41 to naturally rise or travel upwardly within the drying chamber A and in a direction away from the user's face and out through the said vent opening 42 after it has passed between the strands of hair. This direction of travel of the moisture laden or used air to be exhausted is indicated by the arrows 43 in Fig. 7 of the drawings.

It is noted from the above description that the air fed to the drying chamber A by the blower unit 28 is not recirculated but is exhausted after use, so that a fresh supply of moisture-free heated air is constantly provided.

The means for supporting the blower unit 28 within the sound-proof cabinet 31 and the construction of the cabinet itself will now be described: The said cabinet 31 comprises a housing made up of a cylindrical shell 50, which may be made of metallic material and supported at its lower end by a base member 51 carried by a frame 51a having legs, which, in turn, are provided with rollers or casters 52 of customary construction and design to render the hair drying apparatus easily movable. The shell 50 is lined with layers 53, 54 and 55 of any satisfactory sound-proofing material (see Fig. 5). The bottom of the shell 50 is closed by means of a wall 56, while a dome-shaped cover member 60 closes off the upper end of the shell 50 to provide a sound-proof chamber C within the cabinet 31. The cover member 60 comprises a bottom wall portion 61 contactively resting upon the upper edge of the sound-proofing layers 53 and 54 and a dome-shaped portion 62 permanently attached

thereto by the angle members 63, in such manner as to provide a free air space 65 between the upper edge of the wall 61 and the bottom edge of the dome 62. The said space 65 is specifically designed for the purpose of permitting air to pass freely from outside of the cabinet to the interior of the said dome 62, in a direction as indicated by the arrows 64 in Figs. 1 and 5 of the drawings.

The wall 61 is provided with an opening 66 disposed substantially centrally thereof and with upper and lower flanges 67 and 68, respectively, adjacent said opening 66. Within the opening 66 there is fixedly received a sleeve member 69 having the major portion thereof extending upwardly above the wall 61. The sleeve 69 is lined with a layer 70 of resilient material, such as for example felt. An opening 71 in the dome 62, in axial alignment with the opening 66 in the wall 61, is provided, through which the duct 26 freely passes to be slidably received in the sleeve 69. The duct 26 contactively engages the felt layer 70, to dampen transmitted vibrations from the motor. A plurality of openings 72 are additionally provided in the wall 61, the said openings 61 communicating with the inside area of the dome 62 and with the sound-proof chamber C. The blower unit 28 is provided with an intake end 28a and a discharge conduit 27. The said discharge conduit 27 is preferably connected to the duct 26 by means of a length of flexible rubber hose or tubing 75 and is fixedly fastened in position by a pair of binder rings 76 employed in the usual manner known to the hose coupling art.

It is thus seen from the above described construction that when the blower motor is set in operation to effectively actuate the blower, the air within the chamber C will be drawn into the intake end 28a of the blower unit, as indicated by the arrows 77, to tend to create a vacuum in the chamber C. Air will then be drawn in from outside of the apparatus through the opening 65 and the openings 72 in the wall 61. The air forced out at the discharged end 27 of the blower unit will then pass upwardly in a continuously leak-proof passageway through the duct 26 to the portion 26a, thence into the passageway B after being heated and into the ducts 35 to be ejected through the orifices 37 to ultimately act upon the hair of the user, as hereinbefore described. The blower unit 28 is arranged so that the air drawn in at the intake end 28a will pass over the motor before it is discharged into the duct 26 to absorb heat from the motor, to thus aid the heater 40 in heating the air to be used in the drying process.

It is also noted that, due to the sound-proof construction of the cabinet 31, the felt lined sleeve 69 and the flexible coupling 76 (which prevents vibration from being transmitted from the conduit 27 to the duct 26), the operation of the apparatus will be substantially noiseless.

In accordance with my invention, I have also provided a layer 78 of felt or similar material as the layer constituting the innermost side wall of the shell 50, and a felt layer 57 overlying the bottom wall 56, so that particles of dust and dirt in the air drawn in from the surrounding air through the opening 65 will be caught by the felt and held captive to prevent its passage through the blower and into the duct 26.

The following means are employed for supporting the blower unit 28 depending from the duct 26 and disposed within the chamber C of the cabinet 31: A split bracket comprising the parts

80 and 81 encircles the duct 26 at a point adjacent the rubber coupling 75 and within the blower chamber C. The parts 80 and 81 are provided with laterally extending arms 80a and 81a respectively, which are tightly clamped together by means of the bolts 82 and rivets 83 to firmly grip the duct 26 sufficiently to prevent relative movement between the said duct 26 and collar 80, 81. Permanently attached at one end thereof to the flanges 80a and 81a by any suitable attaching means, such as the bolts 84, are a pair of steel tapes 85, each of which is rolled up on a shaft 86 (see Fig. 5), the said shafts being rotatably mounted in a casing 87 fixed to the wall 61. A coil spring 88 attached to the shaft 86 serves to prevent unwinding of the tape 85, to thereby resiliently hold the assembled collar parts 80 and 81 and consequently the blower unit 28 in suspension.

The above described resilient support for the blower unit is designed along the lines of the known standard type of window spring balance mechanism and is so arranged that the hood 10 of the dryer may be adjustably lowered or raised by manually slidably moving the duct 26 within the sleeve 69 to any desired position and it will remain resiliently supported in such position, as would a window when raised or lowered.

To maintain the blower unit 28 out of contactive engagement with the surrounding wall of the chamber C at all times, the ends of the arms 80a and 81a are slidably received in a pair of diametrically disposed tracks comprising the channel members 89 fixed to the shell 50 by means of the rivet members 90. To dampen any possible vibration that might be transmitted through the duct by the flanges 80a and 81a to the tracks 89, the said tracks are preferably lined by the layers 91 of felt (see Fig. 4).

The blower unit 28 and the electric heater 40 in the above described apparatus are adapted to be operated from a source of electrical supply (not shown), by means of the plug 92 attached to the wires 93 leading to a master switch 94, and is connected to the heating element 40 by the conductor wire 95, the return wire 96 completing the circuit to the source of supply. The motor M of the blower unit 28 is connected to the source of supply by the shunt wires 97 and 98. A heating switch 99 is employed for independently controlling the operation of the heater 40. It is thus seen from Fig. 13 of the drawings that when the master switch 94 is closed, the motor M will become energized to operate the fan 29, which will force air up through the duct 26 and into the drying chamber, as hereinbefore described. When it is desired to heat the air being fed into the drying chamber, the heater switch 99 is closed, which brings the heater element 40 into the circuit.

The following means are provided for automatically shutting off the heater 40 whenever a given temperature is reached: As shown in Figs. 12 and 13, one end of the heater 40 is connected to a resilient member 100 of conductive material, having a part 101 thereof normally angularly biased, as shown by the dotted lines in the drawings. A second member 102 of electrically conductive material, having a part 103 thereof, is interposed between the conductor 96 and the member 100. Normally, the part 103 of the member 102 and the part 101 of the member 100 are out of contact. A fuse member 104 mounted in an insulated plug 105, which in turn is fixed to the bottom wall 25b of the member 25, serves to cause the part 101 to contactively en-

gage the part 103, to complete the electric circuit through the members 100 and 102. This fuse member 104 is mounted in the wall 25 by having the plug 105 threadedly received in the said wall 25. A knob 106 may be employed to facilitate the mounting of the fuse 104. The material of the fuse 104 is such that when the heater 40 reaches a given temperature, the said fuse 104 will melt, which will cause the part 101 of the member 100 to be restored to its normal dotted line position, to thus break the circuit through the heater.

By the above described construction it is seen that, should the motor fail for any reason, then the heater 40 would continue to function without air being forced thereover. This would result in the heater reaching a higher temperature than would be the case with the motor in operation. Therefore, when a predetermined temperature is reached, the fuse 104 will melt to effectively break the circuit through the heater, thereby preventing injury to the dryer and to the user of the dryer due to excessive heat.

In accordance with my invention, I have provided means whereby my hair dryer, as described above, may be additionally adapted for use as a blower for cooling a permanent wave and for drying long hair. To this end, I have provided an opening 110 in the bottom wall 25b of the member 25 (see Figs. 7, 8 and 11). The opening 110 is made substantially larger than the orifices 37, so that the direction of the flow of air from the said orifices 37 toward the center of the drying hood 20 will be changed by the relatively large stream of air flow through the opening 110, and forced out through the hood opening 24.

The following valve mechanism is employed for selectively closing off the opening 110: A flat plate 111 is pivotally mounted at one end thereof on the wall 25b by means of the pivot 112, the plate 111 being designed to completely cover the opening 110, as shown in Fig. 11 of the drawings. A stop pin 113 is provided to limit the pivotal movement of the plate 111 in a clockwise direction, to insure that the said plate 111 will completely cover the opening 110 when rotated into position. To facilitate the rotational movement of the plate 111, a rod 114 is pivotally attached at one end thereof to the plate 111 by the pivot 115, the opposite end of the rod 114 being designed to pass to the exterior of the apparatus, the said last named portion of the rod 114 being provided with a knob 116 to facilitate the operation of the plate 111. It is thus seen from the above described construction that, when it is desired to utilize the opening 110 for an air passageway, the rod is caused to slidably move in the direction of the arrow 117 shown in Fig. 11, which will cause the plate 111 to pivotally move in a counter-clockwise direction to uncover the opening 110.

I have found that when the ducts 35 are made of rubber or other similar suitable flexible material, very highly satisfactory results are obtained.

In order to facilitate the movement of the cabinet 31, a handle member 120 may be provided on the dome 62, the said handle being attached thereto by any suitable means, such as for example the screws 121. The handle 120 is also adapted to be used to support coils of the conductor wires 93.

In Figs. 14 to 17 I have shown a modified form of my invention, in which the blower unit 28 is so supported in the chamber C of the cabinet

130 that it may be readily removed as a unit with the removal of the dome or cover 131.

In this form of my invention the cabinet 130 comprises the same outer metallic shell 50 and the layers of sound-proofing material. In other respects the construction shown in Figs. 14 to 17 is also similar to that shown in the Figs. 1 to 13 form of my invention, with the exception of the tracks 132, which in this case are attached directly to the wall 133 of the cover and are removable therewith, instead of the tracks 90 which are permanently attached to the cabinet. The said tracks 132 are disposed on opposite sides of the blower unit 28 and coupling 15 and are maintained a predetermined distance apart by the ring 134 fixedly attached to the said tracks 132 by the rivets 135 adjacent the lower ends thereof. A bracket 136 encircles the duct 26 adjacent the rubber coupling 75. The bracket 136 is provided with a pair of diametrically opposed arms 137 extending therefrom, the said arms 137 having rollers 138 mounted at the ends thereof, the said rollers in turn being operatively received in the tracks 132.

It is thus seen that, when it is desired to adjust the height of the drying hood 10, the duct 26 and depending unit 28 will ride along the tracks 132 due to the rollers 138. It is also seen that, when it is desired to remove the cover 131, the duct 26, the unit 28, the tracks 132 and the bracket 136 may be removed and replaced as a unit. For maintaining the drying hood 10 in any selected height, the same window spring balance mechanisms may be employed and in the same manner as in the previously described form of my invention, except that one end of each of the steel tapes 139 is fixed to an arm 140 extending from the bracket 136. A pair of stop members 141 (see Fig. 17) may be employed for limiting the downward travel of the rollers 138. It is also noted that in this form of my invention, instead of the innermost layer of felt material 78, I provide a felt layer 142 in the cover or dome 131. The said felt layer 142 and the bottom wall felt layer 57 serve to capture dust particles from the air drawn in through the inlet 65. It is also noted that, instead of the relatively small openings 72 in the cover wall 61, I provide the relatively large openings 143 (see Fig. 15).

It will thus be seen that there is provided a device in which the several objects of this invention are achieved, and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiments above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim as new and desire to secure by Letters Patent:

1. In hair drying apparatus, the combination of: a cabinet having an aperture in the top thereof; an air conduit extending through said aperture and projecting both within and without said cabinet; an air distributing hood carried by said conduit without said cabinet; an air compressing unit carried by said conduit within said cabinet; said conduit, hood, and compressing unit forming an integral assembly; and means comprising counterpoise mechanism connected to said cabinet and said assembly for movably supporting said assembly by said cabinet for movement in a generally vertical direc-

tion; said cabinet having an aperture therein forming an air intake.

2. In hair drying apparatus, the combination of: a cabinet having an aperture in the top thereof; a substantially vertical air conduit extending through said aperture and projecting both within and without said cabinet; an air distributing hood carried by said conduit without said cabinet; an air compressing unit within said cabinet; means comprising a resilient member for supporting said compressing unit by said conduit within said cabinet; said conduit, hood, and compressing unit forming an integral assembly; means for rotatably supporting said assembly by said cabinet for movement about a generally vertical axis and for linear movement in generally vertical direction; said means comprising counterpoise mechanism connected to said conduit and to said cabinet; and means for maintaining said counterpoise mechanism in a

predetermined angular position with regard to said cabinet; said cabinet having an aperture therein forming an air intake.

3. In hair drying apparatus the combination of: a cabinet comprising upper and lower parts and having an aperture therein forming an air intake; means for detachably securing said upper and lower parts of the cabinet together; said upper part of the cabinet having an aperture in the top thereof; an air conduit extending through said aperture and projecting both within and without said cabinet; an air distributing hood carried by said conduit without said cabinet; an air compressing unit carried by said conduit within said cabinet; said conduit, hood, and compressing unit forming an integral assembly; and means for movably supporting said assembly by the upper part of said cabinet for movement in a generally vertical direction.

EDWIN W. VOSE.