March 16, 1937. C. G. GROSS 2,074,018

HAIR DRYING APPARATUS

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Fig 1

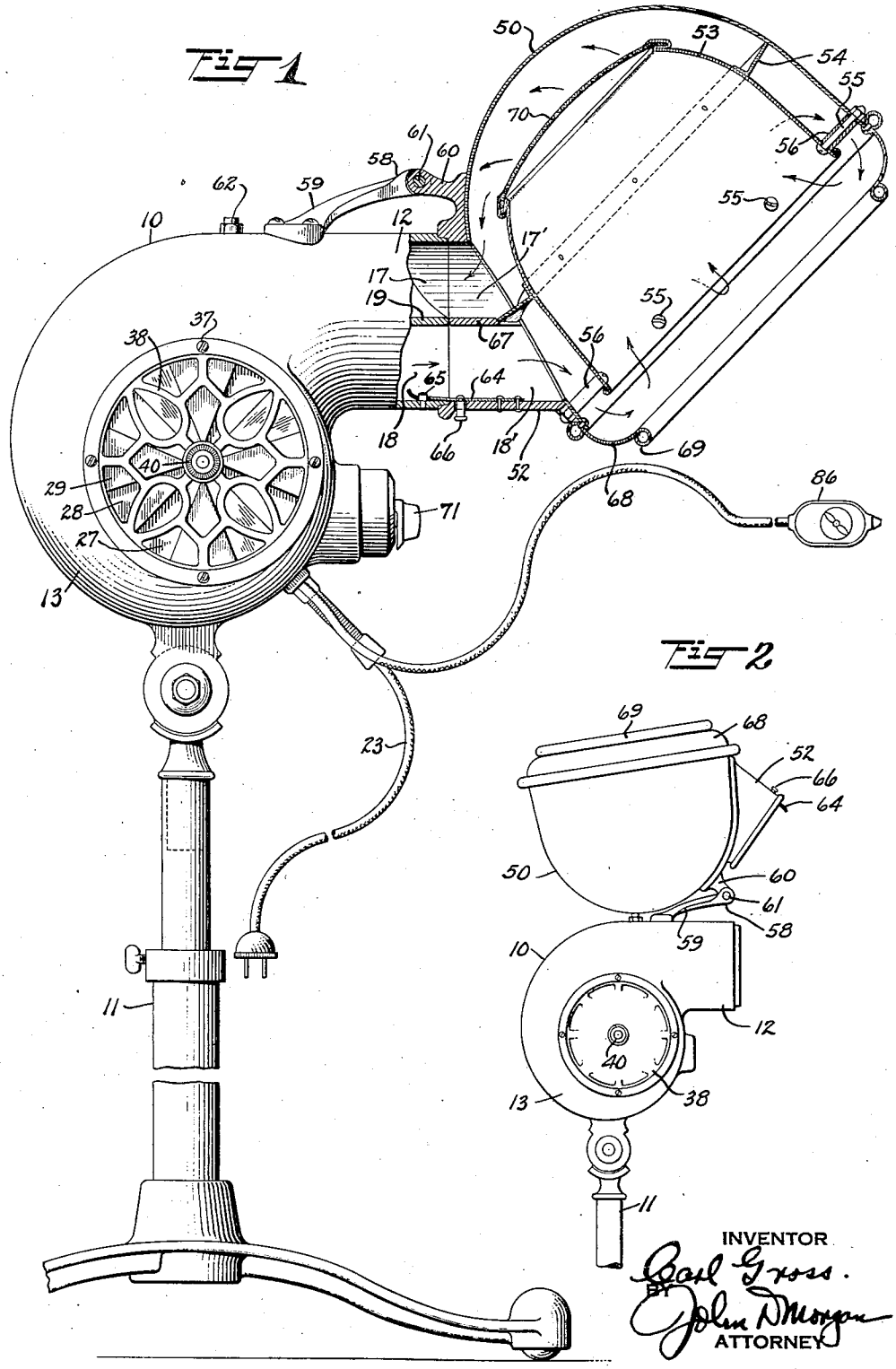


Fig 2

INVENTOR
Carl Gross.
BY
John D. Morgan
ATTORNEY

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Fig 3

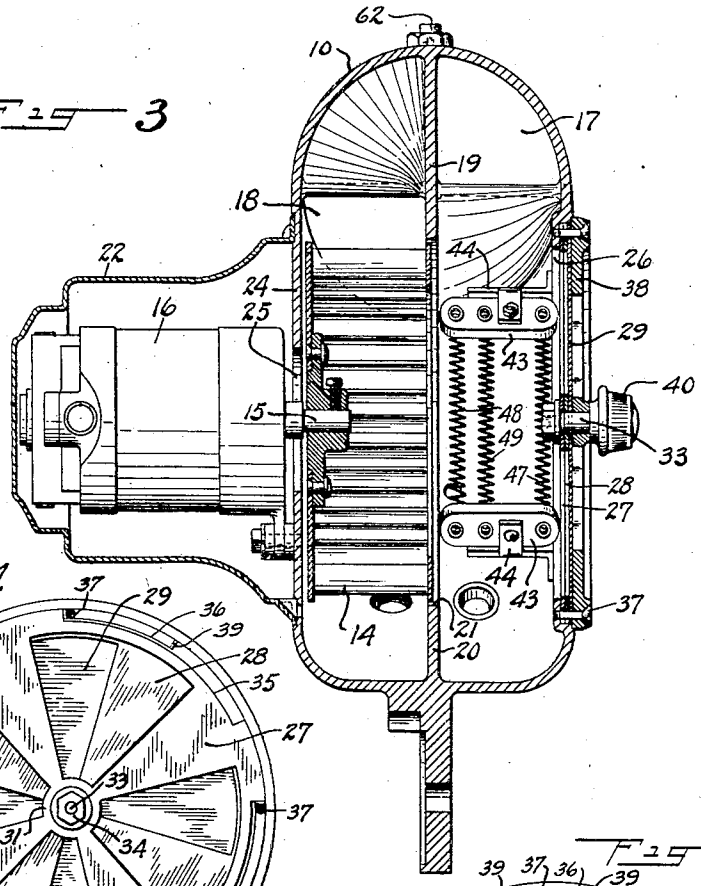


Fig 4

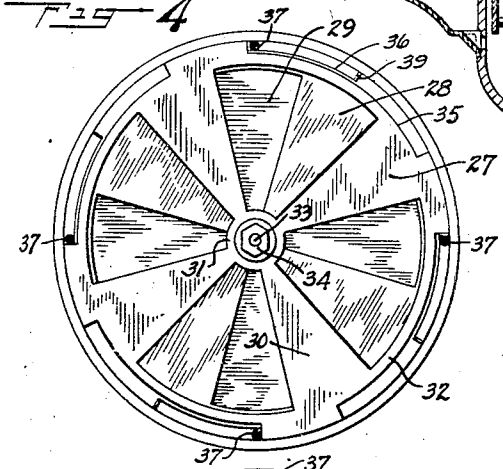
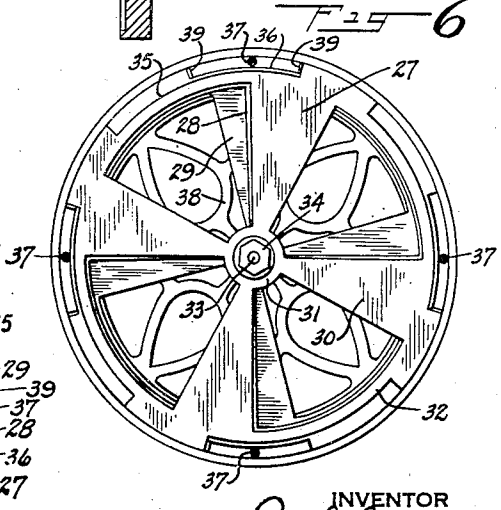


Fig 6



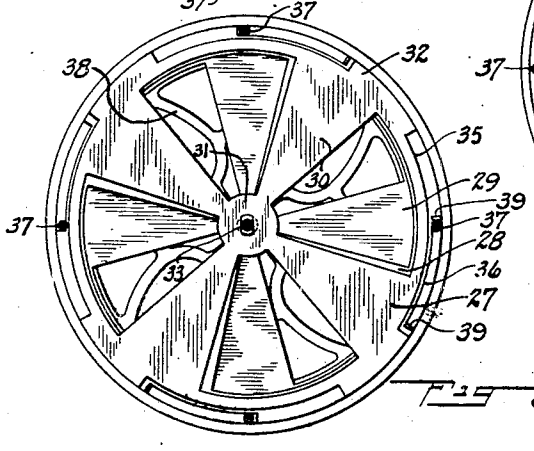


Fig 5

INVENTOR
Carl Gross
BY
John D. Morgan
ATTORNEY

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HAIR DRYING APPARATUS

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Fig 7

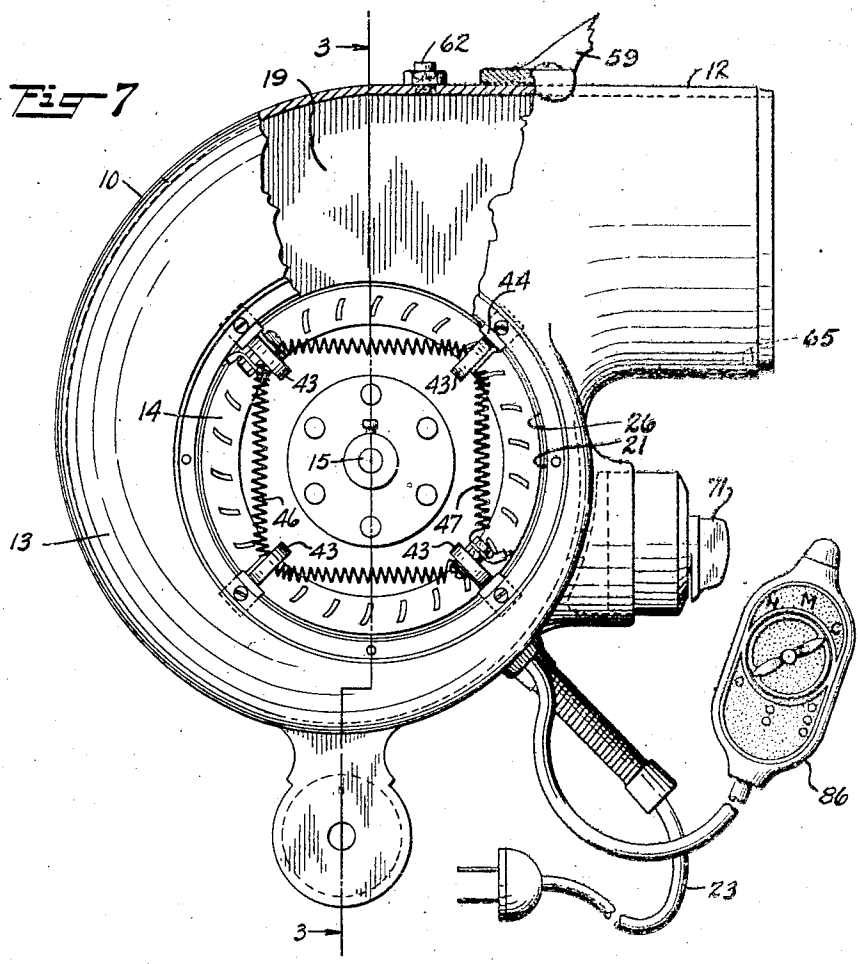
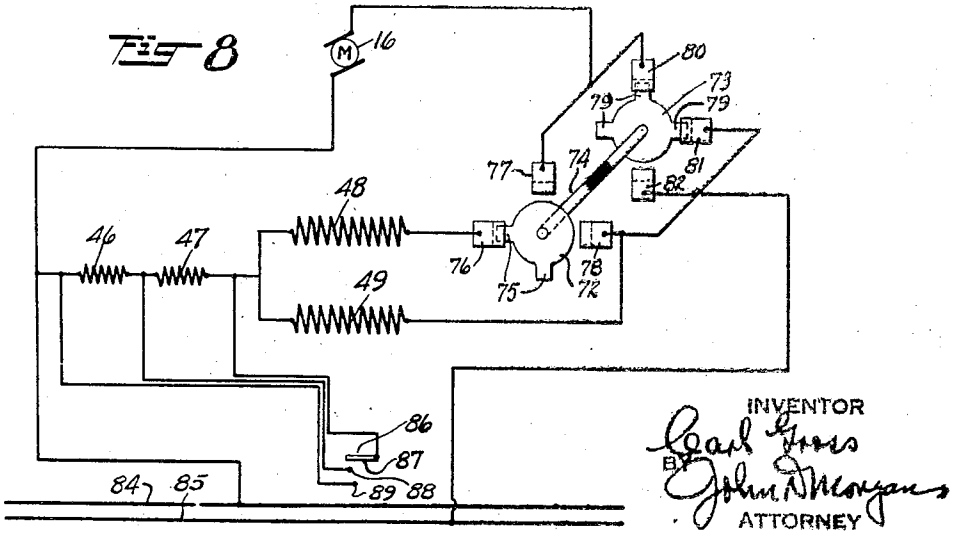


Fig 8



INVENTOR
Carl Gross
BY John D. Morgan
ATTORNEY

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UNITED STATES PATENT OFFICE

2,074,018

HAIR DRYING APPARATUS

Carl G. Gross, Mount Vernon, N. Y., assignor, by mesne assignments, to American Machine and Metals, Inc., New York, N. Y., a corporation of Delaware

Application March 3, 1933, Serial No. 659,445

3 Claims. (Cl. 34—26)

The present invention relates to apparatus for drying hair upon the human head, and more particularly to a novel and improved hair drying apparatus which may be alternatively used as a blower.

Objects and advantages of the invention will be set forth in part hereinafter and in part will be obvious herefrom, or may be learned by practice with the invention, the same being realized and attained by means of the instrumentalities and combinations pointed out in the appended claims.

The invention consists in the novel parts, constructions, arrangements, combinations and improvements herein shown and described.

The accompanying drawings, referred to herein and constituting a part hereof, illustrate one embodiment of the invention, and together with the description, serve to explain the principles of the invention.

Of the drawings:—

Figure 1 is a side elevation of an illustrative embodiment of the present invention, with certain parts being shown in section;

Figure 2 is a side elevation of the embodiment shown in Figure 1, with the hood thrown back so that the apparatus may be used with a blower;

Figure 3 is a detail vertical section through the central portion of the fan and fan casing, with certain parts removed;

Figures 4, 5 and 6 are detail views of the shutter device in several positions, and looking from the interior of the fan casing;

Figure 7 is a fragmentary detail view of the fan casing and associated parts, with certain parts broken away or removed; and

Figure 8 is a diagrammatic view showing the electrical circuit and connections for the motor, heating coils and switches.

The present invention has for its object the provision of a novel and improved drying apparatus for the drying of hair on a head, said apparatus being adapted to operate either as a drier or as a blower. A further object is the provision of a recirculating drier which can be operated as a blower to direct a powerful stream of heated or unheated air against the customer's scalp. Still another object is the provision of a drier which may operate to recirculate the air over the customer's head or may be operated without recirculation, thereby continuously delivering a fresh volume of air and passing it over the scalp and hair.

Referring to the illustrative embodiment of the invention, the apparatus of the present invention preferably comprises a motor-driven fan operating within a casing, a pair of air conducting members, and a hood to fit over the customer's head, the conducting members being formed and arranged to supply air to and withdraw air from said hood and lead this air to and away from the fan. Means are also preferably provided for detachably connecting the hood with the air conducting members so that the apparatus may be used as a drier or as a direct blower, as desired. Shutter control means adjacent to the fan are also provided for controlling the supply of fresh air to the fan, and baffle means are provided within said hood for circulating the air in a definite path over the head, the fresh air preferably being discharged around the neck and forehead of the customer while the air is withdrawn from a point closely adjacent to the top of the head. Suitable heating means, which are preferably regulable, are provided for heating the air to expedite and render more comfortable the drying process.

It will be understood that the foregoing general description and the following detailed description as well, are exemplary and explanatory of the invention but are not restrictive thereof.

As embodied in the device shown in detail in the accompanying drawings, a casing 10 is provided, which is mounted on an adjustable stand 11 of conventional construction, and comprises a cylindrical portion 12 opening into the involute portion 13 of the casing proper within which is a cylindrical chamber conforming closely in diametral size to the size of the fan. The fan is preferably a siroco fan 14, mounted on motor shaft 15 which extends through one side of the casing and is journalled in the motor 16 mounted on the same side of the casing. The cylindrical portion 12 is divided into two ducts 17 and 18, each semi-circular in cross section, and separated from each other by means of a web 19, which may be cast integrally with the casing 13 and cylindrical portion 12. At its outer end, web 19 preferably lies in a horizontal plane and is formed as a screw so that it terminates adjacent to the fan in a vertical plane and is extended to form a wall 20 dividing the involute casing 13 into two side by side halves.

Wall 20 is preferably formed with an opening 21 concentric with the fan 14, and of a size to fit closely over the circumference of the fan, along its edge, while permitting free rotation of said fan, this opening serving to admit air to the central portion of said fan. The air sucked through said opening is expelled by said fan

through duct 18, while the duct 17 serves to supply air to said fan. If it is desired to have the upper duct carry the air under pressure, the web 19 may be formed as a right-handed screw, instead of as a left handed screw.

A dust cover 22 may be provided over said motor 16, and suitable conductors 23 are provided for supplying power to the motor in the usual manner. The casing wall 24, on which the motor is mounted, may be provided with an enlarged opening 25 through which the motor shaft passes, for permitting a small amount of cooling air to be drawn over the motor by said fan.

Means are also provided for supplying air directly to said fan, and as embodied, the other side wall of said casing 14 is formed with a relatively large circular opening 26 over which is mounted a variable shutter device so that more or less air may be drawn in through said opening 26. As embodied, this shutter device comprises a plurality of cruciform members 27, 28 and 29. Each of said members 27, 28 and 29 comprises four radially positioned segmental vanes 30 connected together at their centers by a circular piece 31, and along their outer edges by an annular ring 32. The several members are preferably of the same size and general shape, each vane extending slightly more than 30° and these members 27, 28 and 29 are arranged concentrically with each other on a short shaft 33. Members 28 and 29 are loosely mounted on said shaft while member 27 is made fast to shaft 33 by means of the splined end of said shaft and nut 34. Along the annular portion 32 of member 27 are formed a series of spaced arcuate slots 35, each of a length slightly more than 60°, while member 28 is similarly provided with similarly spaced arcuate slots 36 of approximatey 30°. Member 29 need not be provided with any slots but mounting screws 37 pass through it and slots 35 and 36 and limit movement of members 27 and 28, also serving to secure the guard grille 38 in position to the casing wall. The ends of slots 36 are provided with small lips 39 at both ends of each slot which project into slots 35 and serve to move member 28 by rotation of member 27. A knob 40 is mounted on shaft 33 and is convenient for turning said shaft to open or close the shutter device.

Figures 4, 5 and 6 show several positions of the members 27, 28 and 29 to regulate the air volume. In Figure 4, the shutters are closed, in Figure 5 they are partially open and in Figure 6, they are turned to their maximum opening. As member 27 is rotated from the position of Figure 5 to that of Figure 6, or from that of Figure 5 to that of Figure 4, tongues 39 on member 28 are engaged by the ends of slots 35 in member 27 and rotate member 28.

Heating means are provided in the path of the air being circulated for heating the air to the desired temperature so as to expedite drying of the hair. For this purpose, a plurality of supporting members 43 are provided which are preferably positioned closely adjacent to the intake side of the fan and are positioned parallel to each other and to the axis of the fan. These supporting members 43 are mounted on small brackets 44 which may be attached to the inner side of the casing wall adjacent to opening 26. The particular arrangement of the heating coils may be varied widely, but as embodied, the coils are connected together as shown in Figure 8 of the drawings. As there shown, there are provided two relatively small coils 46 and 47 of different resistance which are connected together in series, and are also in series with the parallel connected resistance heating coils 48 and 49, also of different resistance. By variously connecting the several coils together, as will be described, the temperature of the air circulated by the fan may be widely varied to suit the various operating conditions.

Means are also provided adapted to fit loosely over the customer's head to receive the air circulated by said fan and to pass it over the head in a predetermined path, and if desired, to return this air after circulation to the intake side of the fan. As embodied, a hood 50 having a general bell shape and somewhat larger than a human head is provided and is formed with a circular opening towards its rear side and near its lower edge, which opening is fitted to a cylindrical member 52 of the same diameter as the cylindrical member 12 and forms an extension thereof.

Within hood 50 and spaced therefrom is mounted a second hood-like member 53, of approximately frustro-conical shape and also larger than the customer's head which is adapted to be fitted over the head and receive the major portion of the hair to be dried. Hood 53 is spaced from hood 50 and is mounted thereon by means of an annular ring 54 midway between the ends of hood 53, and by means of bolts 55 and spacers 56, extending between the lower edges of hoods 50 and 53, these parts cooperating to hold the inner and outer hoods in a fixed position relatively to each other. Annular spacing member 54 preferably completely fills the space between the two hoods dividing the space between them into two non-communicating portions.

Means are provided for optionally placing the hoods 50, 53 and their associated parts out of operative relation when this is desired, and for this purpose hood 50 is pivotally mounted on the cylindrical member 12 by means of a hinged bracket 58 having one end 59 secured to member 12, while the other end 60 is secured to hood 50 and may be formed integrally with the cylindrical member 52. The ends 59 and 60 are pivoted around pivot pin 61 and permit the hood portion 50 to be laid back on top of cylindrical member 12 and casing 10, resting on buffer stop 62. The adjacent and interfitting ends of cylindrical members 12 and 52 are preferably stepped to secure a tight joint which will not leak an appreciable quantity of air. Also, a catch may be provided for releasably locking the hood in the position shown in Figure 1, and as embodied comprises a spring 64, riveted at one of its ends to the inner wall of cylindrical member 52, and apertured at its other end to pass over and engage with a pin 65 on the inner wall of member 12. A push pin 66 is secured to the spring and passes outwardly through the wall of member 52 and provides a means for releasing the catch.

Cylindrical member 52 is provided with a diametral web 67, positioned horizontally and forming an extension of web 19, to which is fastened the annular ring 54 for supplying air under pressure from the fan to the lower half of the hood and for withdrawing air from the upper half of the hood by means of the fan acting through ducts 17, 17', 18 and 18'.

The effluent air passes around the lower portion of hood 53 and is discharged in an annular stream, and for directing this stream towards the head and particularly the neck, forehead

and front edges of the hair, the lower portion of the hood 50 is provided with an inwardly curved lip 68, which may be provided with a rolled edge 69. Lip 68 serves to force the effluent air radially inward and directly against the head of the customer. Due to the suction being exerted on the air in the upper portion of the hood, the major portion of the air passed through the annular spaces between the lower ends of hoods 50 and 53 is sucked upwardly and over the head of the customer. At the upper and open end of hood 53 is provided a screen or other foraminous member 70 which serves to prevent the hair of the customer being sucked upwardly and into duct 17'.

The heating means previously described may be connected in circuit with the motor in accordance with the circuit diagram shown in Figure 8 of the drawings. In this circuit, the heating coils 48 and 49 are connected in parallel with each other and in series with the series connected resistance heating coils 46 and 47. A switch 71 is also provided in circuit for controlling the supply of energy to the heating coils and to motor 16. As embodied, switch 71 comprises two rotatable switching members 72 and 73 interconnected by means of a shaft 74 and insulated from each other. Switching member 72 comprises a pair of movable contact members 75 electrically interconnected and spaced 90° apart, and adapted to contact with stationary contacts 76, 77 and 78, also spaced 90° apart. Switching member 73 comprises three movable contact members 79, electrically interconnected and spaced 90° apart, and three stationary contacts 80, 81 and 82 also spaced 90° apart. Contacts 77 and 80 are connected together, while contacts 78 and 81 are similarly interconnected but otherwise the contacts are insulated from each other.

Contacts 77 and 80 are connected to one terminal of motor 16, the other terminal of which is connected to main 84, while contact 82 is connected to main 85. Contacts 78 and 81 are connected to one end of heating coil 49 which has its other end connected to main 84 through heating coils 46 and 47, while coil 48 is connected at one end to main 84 through coils 46 and 47 and at its other end to contact 76.

In the position shown in Figure 8 of the drawings, no current is supplied to either the motor 16 or the heating coils as the circuit is broken at contact 82. By rotating the rotatable switching members 72 and 73 clockwise through 90°, power is supplied through contact 82 to contacts 81, 80, 76, 77 and 78 energizing the motor 16 and heating coils 46, 47, 48 and 49. A further rotation of 90°, interrupts the supply of energy to heating coil 48. Another rotation of 90° interrupts the supply of current through contacts 81, 76, and 78 and in this position no power is supplied to any of the heating coils. It is thus possible to operate the motor while power is supplied to none, or all of the heating coils, or to only coils 46, 47 and 49.

Means are also provided for permitting the customer to control the heat within limited ranges to suit individual tastes and for this purpose is provided a switch 86 having a movable contact 87 and two stationary contacts 88 and 89, with either or neither of which contact 87 may engage. Contact 87 is connected to the end of heating coil 47 and between it and coils 48 and 49, contact 88 is connected between the ends of coils 46 and 47, while contact 89 is connected to the other end of coil 46. By contacting contacts 87 and 88 coil 47 is short-circuited, and by contacting contacts 87 and 89, coil 46 is similarly short-circuited. Coil 47 is preferably of a higher resistance than coil 46, so that when contact 87 engages neither contact 88 nor 89 the heat supplied by the coils is least, and greatest when contact 87 engages contact 89. In practice and as shown in Figure 1, switch 71 is preferably mounted on the fan casing, while switch 86 is connected by means of a flexible conductor of suitable length.

The operation of the apparatus of the present invention may be briefly summarized as follows:

With the hood 50 in the position as shown in Figure 1, adapting the apparatus for use as a recirculating drier, the air is circulated by fan 14 and is forced by it into duct 18, and from thence into duct 18'. Duct 18' opens into the lower annular spaces between hoods 50 and 53 and as the air emerges from the annular opening at the bottom edge of hood 53 the air is directed inwardly towards the customer's head by rim 68. The air then flows upwardly into hood 53 over the customer's head and is sucked through screen 70 into the upper annular space between hoods 50 and 53 and thence into duct 17' and 17 which lead the air to the opening 21 communicating with the central portion of siroco fan 14. A small amount of fresh air is continually added to the air being recirculated and thus maintains the drying properties of the air.

By opening or closing the shutter device over opening 26, the amount of recirculation may be controlled to any extent desired, and with the shutter device completely open, practically no recirculation takes place.

By swinging the hood back and into the position shown in Figure 2 of the drawings, the apparatus is converted into a blower adapted to direct a powerful, concentrated blast of air against a relatively small portion of the head. In this manner of operation, the air is forced out through duct 18, and if the shutters 27, 28 and 29 are closed a considerable amount of this air is sucked back into the fan and is recirculated. However, if the shutter device is opened, very little air is recirculated by the fan due to the greater facility with which air may be drawn through the shutter device directly into the fan than through duct 17.

With any of the manners of operation described, the heat may be varied as desired by manipulation of switches 71 and 86, thereby providing an unusual range of usefulness for the apparatus.

The invention in its broader aspects is not limited to the specific mechanisms shown and described but departures may be made therefrom within the scope of the accompanying claims without departing from the principles of the invention and without sacrificing its chief advantages.

What I claim is:—

1. A drier for use in drying hair including in combination a hood to fit over a human head, a shell within said hood and spaced slightly therefrom, means for dividing the space between said shell and hood into two annular spaces end to end and means for expelling air through said lower space and withdrawing it through said upper space.

2. A hair drying apparatus including in com-

bination a fan for delivering air under pressure, a hood to receive a portion of a person's head, air conduits between said hood and fan, one of said conduits being positioned and adapted to supply air to said hood from the outer portion of said fan and the other conduit being adapted to withdraw air from said hood and return it to the center of said fan, an inner hood mounted within said first hood and spaced therefrom and a web between said hoods to form upper and lower chambers through which and said inner hood the air is circulated by said fan, said chambers being connected to different conduits.

3. A drier for use in drying hair including in combination a hood to fit over a human head, a shell within said hood and spaced slightly therefrom, means for dividing the space between said shell and hood into two annular spaces end to end and means for expelling air through one of said spaces and withdrawing it through the other of said spaces.

CARL G. GROSS.