

Nov. 18, 1930.

O. NORDEN

1,781,879

HAIR DRIER

Filed Oct. 28, 1929

2 Sheets-Sheet 1

Fig. 1.

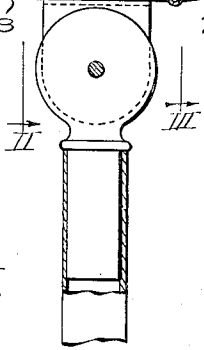
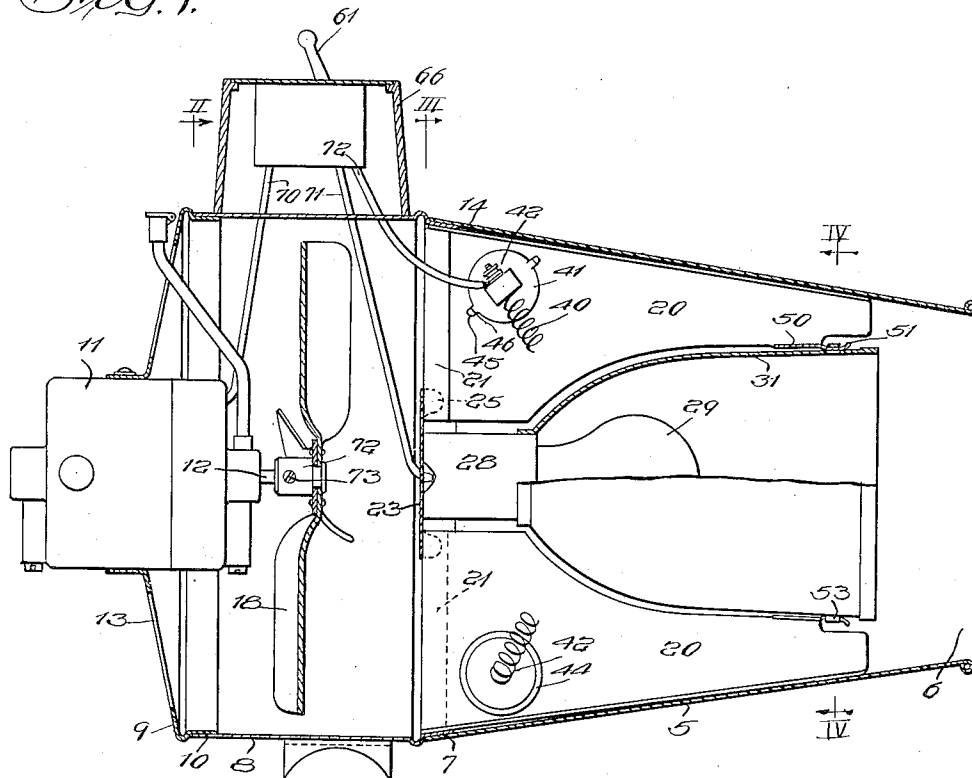


Fig. 5.

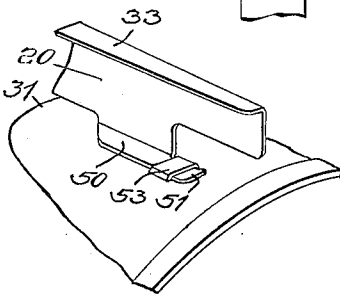
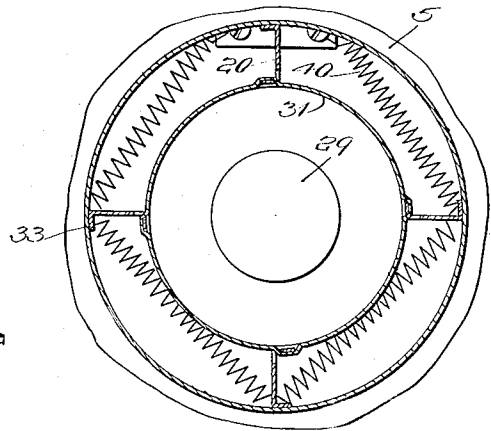


Fig. 4.



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2 Sheets-Sheet 2

Fig. 2.

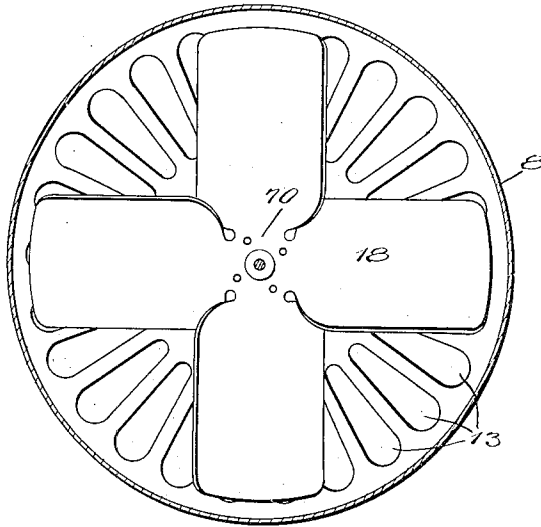


Fig. 3.

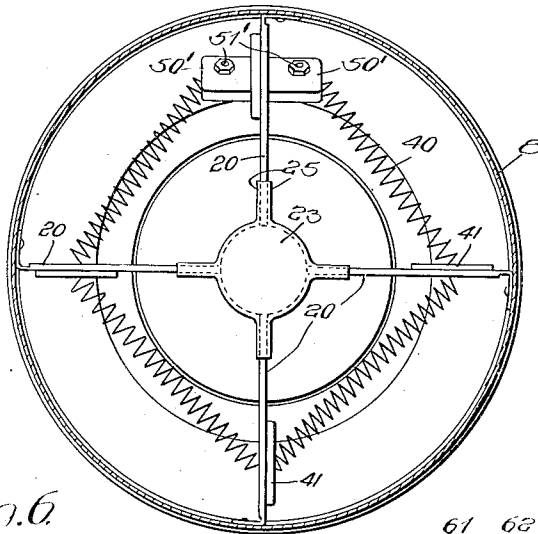
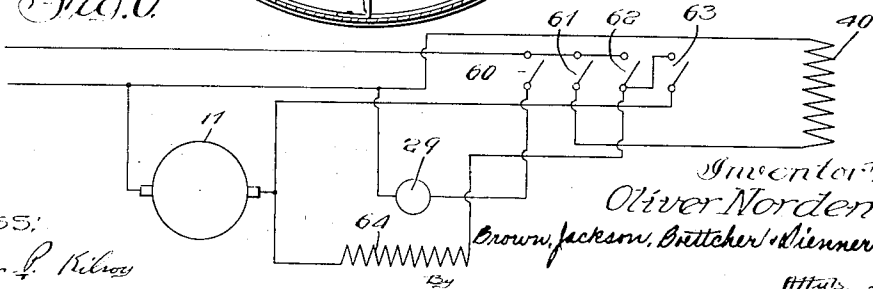


Fig. 6.



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UNITED STATES PATENT OFFICE

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HAIR DRIER

Application filed October 28, 1929. Serial No. 402,890.

The present invention relates to hair driers and more particularly to hair driers of the type illustrated and described in prior Patent No. 1,541,988 of June 16, 1925.

5 It is one object of my present invention to provide an improved form of construction for hair driers of the above mentioned type in which the parts are few and simple and their assembly into an operative device is made less expensive.

10 Another object of my invention is to provide improved means for preventing swirling of the projected air and for directing same outwardly in a straight line.

15 A still further object of my invention is to so assemble the component parts of my hair drier that a greater thermal efficiency is attained. Another object of my invention is to provide a simplified fan construction particularly adaptable for use in hair drying apparatus and in which the action of the fan is improved adjacent the axis. Another object is the provision of an improved reflector together with an improved mounting and arrangement of the same with reference to the swirl preventing means as well as to an improved arrangement of this means not only with reference to the reflector, but also with reference to the drum and casing of the device.

20 Other objects and advantages of my invention will be apparent to those skilled in the art after a consideration of the following detailed description, taken in conjunction with the accompanying drawings, in which:—

Fig. 1 is a vertical sectional view taken longitudinally;

40 Fig. 2 is a transverse sectional view taken on the line II—II of Fig. 1;

Fig. 3 is a transverse sectional view taken on the line III—III of Fig. 1;

Fig. 4 is a transverse sectional view taken on the line IV—IV of Fig. 1;

45 Fig. 5 is a fragmentary perspective view showing how the forward end of the reflector is secured to each of the guide vanes; and

Fig. 6 is a circuit or wiring diagram.

50 The particular drier shown comprises a tapered shell or casing 5 having its smaller and

forward end formed to provide an outlet 6. The rear end of the shell or casing 5 is attached at 7 to a generally cylindrical drum 8 which forms a continuation of the inner or rear end of the shell 5. The cross section of the drum 8 may, of course, vary from cylindrical if desired. The drum 8 and shell 5 may be of suitable sheet metal construction, although this, too, may be varied widely if found desirable.

60 The rear end of the drum 8 carries a head or end member 9 having a flange 10 received within the drum 8 and secured thereto in any known manner, as by small bolts and nuts, by rivets, or welding. A suitable electric motor 11 is mounted axially or centrally in the head or end member 9, preferably with the revolvable motor shaft 12 disposed axially with respect to the drum 8 and shell 5. The end or head member 9 is also provided with suitable inlet openings 13 through which air may be drawn into the device and discharged or projected longitudinally through the shell or casing 5 toward and from the outlet or discharge end 6. A fan or propeller 18 is mounted on the forward end of the shaft 12.

75 Secured to the forward end of the drum 8, as by welding or riveting, are a plurality of guide vanes 20, four being shown in Fig. 3. These guide vanes 20 are mounted so as to be radial with respect to the longitudinal axis of the drum 8 and shell or casing 5. The guide vanes 20 are provided with folded over portions 21 at their rearward ends, these ends being the points of attachment with the drum 8, the vanes are thereby strengthened and the structure made more rigid. A supporting plate 23 is secured to the inner or axial ends of the folded over portions 21, the plate 23 being provided for this purpose with a plurality of pairs of forwardly turned ears which may be welded or riveted to the guide vanes 20 as shown in Figs. 1 and 3. The supporting plate 23 is adapted to carry an electric socket or mounting 28 which receives an electric lamp 29 or other source of radiant energy. This lamp is preferably mounted at the focus of a relatively long reflector 31, which may be of the parabolic type,

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and which is mounted at one end upon the socket member 28 and at its other or outer end is carried by the guide vanes 20 by means hereinafter described.

5 The outer margins of the vanes 20 are preferably inclined in conformity with the taper of the shell 5 and are formed to contact with and support the shell, the guide vanes 20 being provided for this purpose with turned over marginal edges 33 so formed as to lie substantially flat against the adjacent inner surface of the shell or casing 5. The latter may also be provided with screws threaded into the flange 14 of the drum 8.

15 For the purpose of heating the air, I provide a heating coil 40 comprising a suitable metallic wire helically wound and supported to be in the current of air projected forwardly by the fan 18. As shown in Figs. 1 and 3, the heating coil 40 is formed in a substantially closed figure and surrounds the reflector 31. The heating coil 40 is supported entirely by the guide vanes 20, and for the purpose of supporting the coil 40 without electrical contact with the vanes 20, I provide each of the latter with an opening 41 in which is received an insulating bushing or button 42. These bushings or buttons are clamped in position upon the vanes 20 by rings 44 having lugs 45 turned in through notches 46 and then turned back into cooperation with the opposite sides of the vanes 20 to clamp the insulating buttons 42 firmly thereto.

20 Three of the buttons or bushings 42 are apertured to permit the coil 40 to extend therethrough. The fourth bushing or button 42 is provided with a pair of oppositely extending contact lugs 50', each of the latter being provided with a terminal bolt 51' to which the ends of the heating coil 40 are respectively connected, as shown in Fig. 3.

40 Referring now to Figs. 1 and 5, it will be noted that the forward ends of the guide vanes 20 are provided inwardly with portions 50 bent at right angles to the main body of the guide vanes, and which portions have forwardly extending tongues 51.

50 As is clear from Fig. 5, these tongues 51 are adapted to be passed through loops 53 formed in the reflector 31, as by slitting and pressing outwardly a small portion of the material of the reflector 31. By subsequently bending upward the tongues 51, it will be seen that the reflector 31 will be securely held in position at its forward end by the loops or slots 53.

55 The motor 11, coil 40, and lamp 29 are respectively connected to a source of electric current, as shown in Fig. 6. The switch 60 controls the operation of the lamp 29, the switch 61 controls the operation of the heating coil 40, and the switches 62 and 63 control the operation of the motor 11. A resistance coil 64 is provided in series with the switch 62 whereby the motor 11 may be

operated at a reduced speed. All of the switches are mounted within a switch box 66 preferably carried at the top of the drum 8, as shown in Fig. 1. Suitable leads 70, 71 and 72 connect the switches with the motor, lamp and heating coil, respectively.

70 Having particular reference now to Fig. 1, it will be observed that when the motor 11 is operated, the fan 18 will forcibly direct a current of air past the heating coil 40, along the reflector 31 and out the outlet 6, the guide vanes effectively preventing eddy currents and swirling of the air. It will be observed that the guide vanes occupy practically all of the space between the reflector 31 or the socket 28 and the shell or casing 5, thus there is no possibility that the air will emerge from the outlet 6 with any circular motion whatever.

80 The relatively long reflector 31 serves the double purpose of, first, offering a relatively small area of resistance to the blast from the fan 18, and second, offering a considerable surface to be swept by the current of air and which thus acts as means to prevent excessive heating of the lamp 29. It is understood, of course, that the majority of the heat and light rays emitted from the lamp 29 are reflected by the reflector 31. In the present device, the air moves in unbroken lines from the fan 18 through the gradually decreasing area of orifice until it emerges from the outlet 6.

85 A feature of considerable importance in securing the advantageous results just enumerated will be found in the construction of the fan 18. As will be seen from Fig. 2, the fan is provided with four blades. Two blades are formed from a single strip of material, preferably sheet metal, in the embodiment illustrated, one blade being formed at each end thereof. Each blade is of substantial width, but the central portion of the strip is reduced, as shown in Fig. 2, to form a circular bearing portion 70 by which the blades are operatively connected together to form a fan. Preferably, the blades are secured together by riveting, but it is obvious that any other means, such as welding, may be utilized if found desirable.

90 95 100 105 110 115 The bearing portion of each of the blade strips is apertured so that the fan may be mounted upon a collar 72, which in turn is mounted upon the shaft 12, as by a set screw 73. It will also be observed that the blades are of such width that the contiguous edges of their inner portions overlap, as shown in Fig. 2, and the blade strips being so formed that the inner ends of the blades are spaced from the fan axis a distance less than half the width of the blade. This makes for increased efficiency and secures a movement of air from the fan which is uniform, since by my construction a substantial flow of air

from the central portion of the fan is obtained.

While I have described, in connection with the accompanying drawings, the specific form in which I prefer to embody my invention, it is to be understood that the invention is not to be limited to the specific means which I have herein shown and described, and that, in fact, widely different means may be employed in the practice of the broader aspects of my invention.

What I claim, therefore, and desire to secure by Letters Patent is:—

1. A drier of the class described comprising the combination of a drum, a tapered casing mounted on the forward end of said drum and having its smaller end extending forwardly therefrom and forming an outlet, means for projecting a body of air through said drum and casing, radial guide vanes to direct the air directly forward and secured at their rear ends to the forward edge of the drum, said vanes being provided with strengthening means at their rear edges, a supporting plate mounted on the strengthening means and extending transversely coaxial with said vanes, a socket supported by said plate, means providing a source of rays of radiant energy adapted to be mounted on said socket, a reflector for concentrating said rays and projecting the same forwardly through the outlet of the casing, each vane having at its forward end a tongue, and the reflector having at its forward end slots adapted to receive said tongues whereby the reflector is carried by said vanes.

2. A drier of the class described comprising the combination of a drum, a tapered casing mounted on the forward end of said drum and extending forwardly therefrom to form an air outlet, means for projecting a body of air through said drum and casing, radial guide vanes to direct the air forwardly in a straight line and mounted on the drum forward of said means and within said casing, said guide vanes being relatively long and spaced from the longitudinal axis of said drum and said casing, a relatively long parabolic reflector positioned within the lengths of said vanes and with said vanes in surrounding relation thereto, and a source of radiant energy mounted within and substantially at the focus of said reflector.

3. In a drier of the class described, a drum having an outlet casing part extending forwardly therefrom, means for projecting a body of air through said outlet casing part, radial guide vanes mounted in said casing part for preventing swirling of the body of air, a socket member mounted upon the rearward ends of said vanes, an electric light mounted in said socket and a reflector surrounding and extending forwardly from said light and surrounded by said vanes and attached thereto.

4. In a drier of the class described, a drum having an outlet casing part extending forwardly therefrom, means for projecting a body of air through said outlet casing part, radial guide vanes mounted in said casing part for preventing swirling of the body of air, a socket member mounted upon the rearward ends of said vanes, an electric light mounted in said socket and a reflector surrounding and extending forwardly from said light and surrounded by said vanes and attached thereto, the radial dimensions of said vanes increasing rearwardly.

5. In a drier of the class described, a drum having an outlet casing part extending forwardly therefrom, means for projecting a body of air through said outlet casing part, radial guide vanes mounted in said casing part for preventing swirling of the body of air, a socket member, an electric light mounted in said socket member, and an elongated reflector for said light, said reflector being mounted upon said socket member and disposed within the lengths of and surrounded by said vanes.

6. In a drier of the class described, a drum having an outlet casing part extending forwardly therefrom, means for projecting a body of air through said outlet casing part, radial guide vanes mounted in said casing part for preventing swirling of the body of air, a socket member, an electric light mounted in said socket member, an elongated reflector for said light, said reflector being mounted upon said socket member and disposed within the lengths of and surrounded by said vanes, and means forming a source of radiant energy mounted upon said vanes at the rear radially increased portions thereof.

7. In a drier of the class described, a drum having an outlet casing part extending forwardly therefrom, means for projecting a body of air through said outlet casing part, radial vanes mounted in said casing part for preventing swirling of the body of air, a source of radiant light within the casing, the radial dimensions of said vanes increasing rearwardly and a reflector for said source of light mounted between and surrounded by the forward radially decreasing vane portions.

In witness whereof, I hereunto subscribe my name this 22nd day of October, 1929.

OLIVER NORDEN.

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