May 15, 1928. 1,669,569

W. MEYER

HAIR DRIER

Filed Jan. 9, 1928 2 Sheets-Sheet 1

Fig. 1.

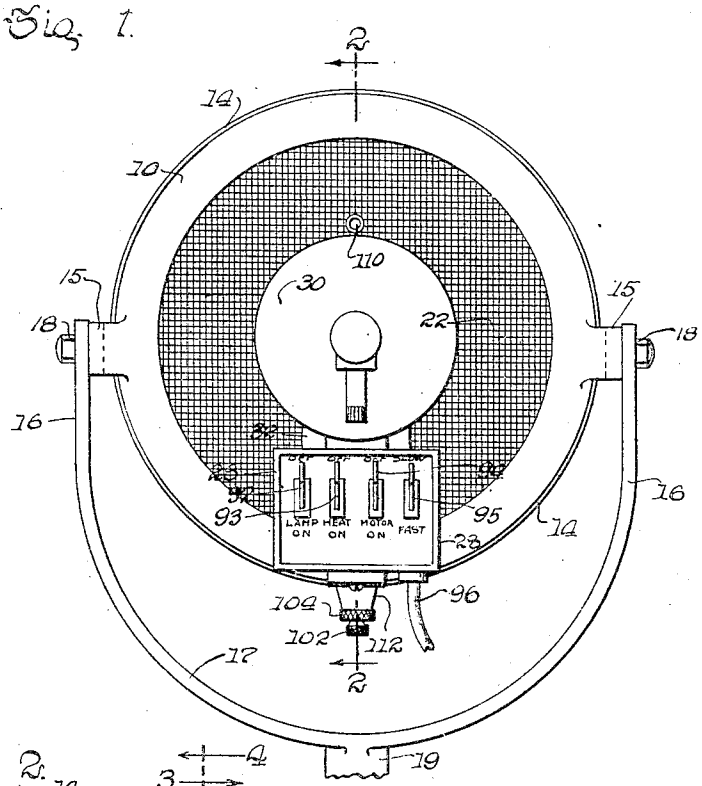
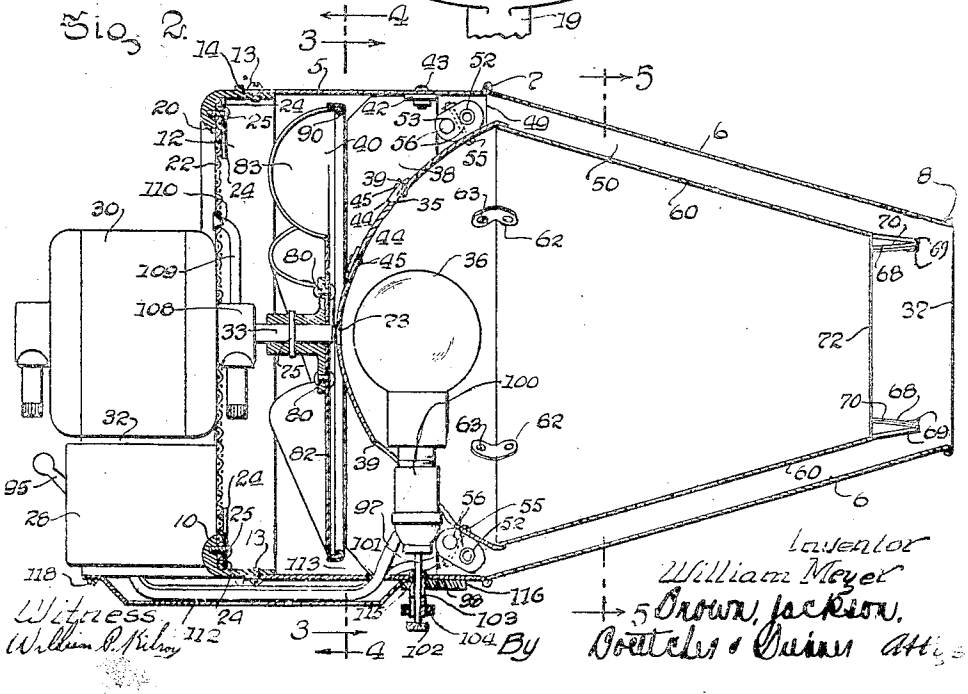


Fig. 2.



Witness
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Fig. 3.

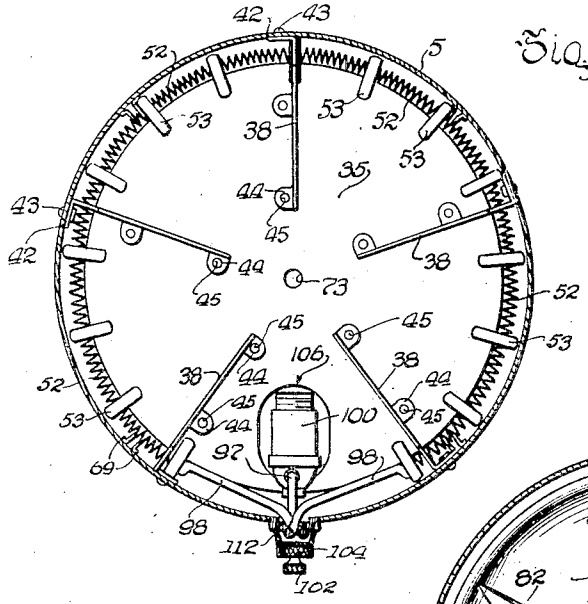


Fig. 4.

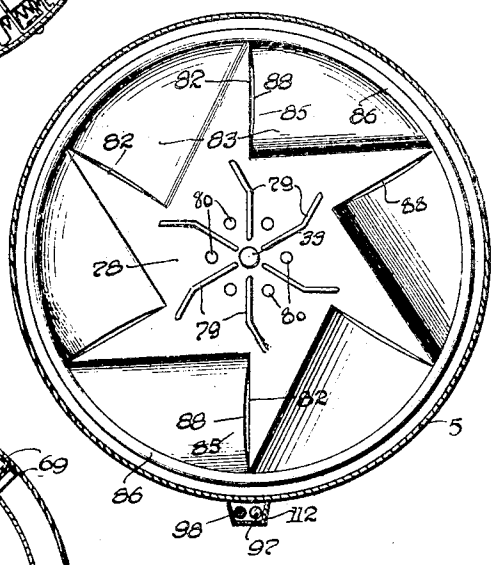
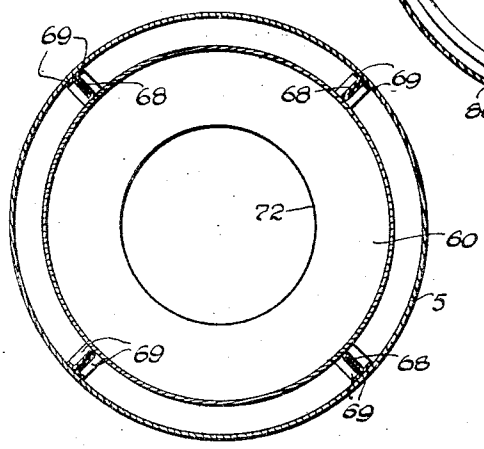


Fig. 5.



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Patented May 15, 1928. 1,669,569

UNITED STATES PATENT OFFICE.

WILLIAM MEYER, OF CHICAGO, ILLINOIS.

HAIR DRIER.

Application filed January 9, 1928. Serial No. 245,378.

This invention relates to hair driers and may be characterized as an improvement upon hair driers of the type illustrated and described in my prior Patent No. 1,541,988 of June 16, 1925, and in my co-pending applications, Serial No. 161,480, filed January 17, 1927, and Serial No. 211,121, filed August 6, 1927.

The object of the present invention is to increase the speed with which the hair drying is effected and to improve the operation and construction of the drier.

According to the present invention, the drier is provided with a generally conical inner wall, which may be supported by the air guides or fins. This inner wall forms an annular space between it and the outer wall or casing of the drier and the air is forced or directed forwardly through this annular space as by means of the motor driven fan or impeller. The annular space is gradually reduced toward the outlet or nozzle of the device, imparting an increased velocity to the air issuing from the device.

In order to prevent the air from issuing in ring form with a dead center, the inner generally conical wall is preferably made shorter than the outside or outer wall, in order to bring the air together short of its issuance from the outlet of the drier.

In order to eliminate any whirling effect of the propelled air between the fan or impeller and the back of the reflector, and any noise caused thereby, suitable air guides or fins are preferably provided in back or rearwardly of the reflector, these fins or guides being conveniently secured to the reflector and to the outer wall or casing of the drier, this manner of attachment of these fins or guides serving the two-fold purpose of suitably mounting the fins or guides and suitably supporting the reflector thereon.

The annular space between the inner generally conical wall and the outer wall of the device is also provided with suitable fins or air guides for preventing swirling or circular motion of the air and for directing the same in a straight line through the annular space, these fins or air guides being adapted to serve the additional purpose of supporting the inner generally conical ring concentrically, or otherwise, as desired within the outer wall or casing of the device.

The drying effect is in direct ratio to the velocity of the air stream, and by directing the air stream through an annular space and gradually reducing this space toward the nozzle or outlet, the velocity, and thereby the drying effect, is materially increased.

The invention is illustrated in the accompanying drawings, in which:—

Fig. 1 is a rear end view of a drier embodying the present invention;

Fig. 2 is a longitudinal section taken on the line 2—2 of Fig. 1;

Fig. 3 is a transverse section taken on the line 3—3 of Fig. 2;

Fig. 4 is a transverse section taken on the line 4—4 of Fig. 2; and

Fig. 5 is a transverse section taken on the line 5—5 of Fig. 2.

The device shown comprises an open ended circular shell or drum 5 having a generally conical or tapering discharge tube 6 attached at its larger end at 7, to the open outlet end of the drum 5. The drum 5 and tube 6 are preferably of suitable sheet metal construction, although this may, of course, be varied widely within the spirit and scope of the present invention. The attachment at 7 may be secured by reflexing the adjacent marginal edges of the drum 5 and tube 6 and interengaging and securely clamping together said reflexed margins. At its outer discharge end the tube 6 preferably has a strengthening and finishing bead 8.

At the inlet end 9 of the drum 5 is a spider 10 having an annular longitudinal rim or flange 12 which fits telescopically into the inlet end 9 of the drum 5 and is secured therein, as by means of suitable screws 13. The spider 10 is preferably in the form of a casting, although this, too, may be varied, and it has an annular external shoulder 14 for abutting the adjacent end of the drum 5 and integral diametrically opposite forwardly extending ears 15, 15, which may be straddled by the legs 16 (Fig. 1) of a mounting yoke 17 and pivoted thereto at 18. Intermediate its ends, the yoke 17 is shown as provided with a post or stem 19 for mounting the yoke and drier upon a suitable stand or other support.

The spider 10 is open at 20, within the surrounding rim-like portion, and the opening 20, which constitutes the inlet through which the air is drawn into the device, is preferably covered by a suitable screen 22 which may be secured peripherally between the generally radial rim or flange of the spider and segmental or arcuate clamping strips 24, which may be of sheet metal and clamped

to the radial flange of the spider by screws 25, with the periphery or margin of the screen secured between these strips 24 and the adjacent flange of the spider.

Formed integral with the rim of the spider 10 is a generally rectangular switch box or casing 28 and the electric motor 30 is mounted at 32 upon the top of the switch box or casing 28 with the revolvable motor shaft 33 disposed axially with respect to the drum 5. The mounting of the motor 32 may be through suitable feet or supports or the mounting might even be integral with the switch box.

Mounted within the drum 5 is a reflector 35 in the focus of which a suitable incandescent or electric light or lamp 36 is disposed to emit radiant heat and light through the outlet 37 of the device. For the purpose of eliminating any whirling effect or swirling of the air behind the reflector and the noise caused thereby, there is provided behind or rearwardly of the reflector a plurality of radial air guides or fins 38 which guide the air in a straight line longitudinally through the drum 5. These air guides or fins 38 are generally three-sided with their forward edges concave at 39 to conform with the back of the reflector and with the other two edges of each fin or guide 38 at generally right angles or normal to each other for cooperation with the inner periphery of the drum 5 and with the forward or outer face of the fan or impeller 40. Adjacent the wall of the drum 5 the guides or fins 38 have lugs or ears 42 turned at right angles and secured, as by means of screws and nuts 43, to the wall of the drum 5 and adjacent the reflector 35 these fins or guides 38 have lugs or ears 44 turned at generally right angles and secured as by means of rivets or screws 45 to the reflector 35. The guides or fins 38 thereby, in addition to their anti-swirling function, perform the additional function of positioning and supporting the reflector 35 concentrically within the drum 5.

Peripherally, the reflector 35 is spaced at 49 from the interior of the drum 5 to provide an annular passage through which the air is delivered to the annular discharge passage 50. A heating coil 52 is preferably supported annularly about the passage 49 in the path of the stream or blast of air through the passage 49, by circumferentially spaced blocks or supports 53 of porcelain, earthenware, or other suitable non-inflammable and insulating material. The blocks or supports 53 are secured to the back side of the reflector 35 by screws and nuts 55 and, in order that the same blocks may be used in devices of different voltages, each block may be provided with a pair of openings 56, each circumferentially or annularly aligned with the corresponding openings of the other blocks. Where one heater coil 52 is sufficient, this coil may be arranged through one of the openings of each block, as shown, and in a device of greater voltage where two heater coils may be desired, one may be arranged through each of the openings of each block.

The generally conical inner discharge wall, which, with the outer discharge tube 6, defines the annular and tapered discharge space 50, is designated at 60. This inner wall 60 is disposed concentrically within the tube 6 and its taper preferably corresponds substantially with that of the tube 6, although this may be varied. At its inner or larger end the inner wall 60 fits against the outer margin or periphery of the reflector 35 and may be suitably secured thereto as by means of straps 62 bridging the meeting margins of the inner tube 60 and the reflector 35. These straps 62 may be riveted to the tube 60 and secured to the reflector 35 as by means of screws 63, which may be removable to permit detachment of the tube 60 from the reflector.

For the purpose of preventing whirling, swirling, or circular motion of the air through the annular space 50, and for guiding or directing the same in a substantially straight line therethrough, the space 50 is provided with two pairs of diametrically opposite air guides or fins 68. These guides or fins 68 are shown as being formed of sheet metal folded together and with their longitudinal marginal edges turned or flanged out at 69 and soldered or otherwise suitably secured to the inner periphery of the tube 6. The forward meeting edges of the folded sides of the fins or ribs 68 are preferably inclined or rounded off and soldered together at 70 and may terminate short of the outer end of the tube 6, as shown. The radial dimension of each rib 68 is preferably substantially uniform, from end to end, and substantially equal to the radial dimension of the annular space 50, thereby radially dividing the entire annular space 50 at suitably spaced intervals circumferentially thereabout and, at the same time, performing the additional function of concentrically disposing and supporting the inner tapered wall or tube 60 within the tube 6.

The inner tapered wall 60 is preferably shorter than the wall or tube 6 so that its outer end 72 will terminate short of the outer end 37 of the tube 6. I find that this brings the annular stream of air together short of the outer end of the tube 6 and prevents the air from issuing in ring form or with a dead center. The taper of the outer tube 6 and inner wall 60 gradually reduces the annular space 50 toward the nozzle or outlet end of the device, and this reduction increases the velocity of the air stream and thereby increases the drying effect and the speed of the drying operation, which is, as already pointed out, in direct ratio to the velocity of the

air stream. The reflector 35 preferably has a small axial opening, as indicated at 73.

For the purpose of drawing air through the rear inlet opening 20 and screen 22 and forcing or impelling the air over the back of the reflector 35 and forwardly across the heating coil 52 and on through the annular passage 50 and out through the discharge end 37, an impeller or fan 40 is suitably fixed at 75 upon the motor shaft 33 so that it will rotate therewith. The fan or impeller 40, which is disposed adjacent the rear of the reflector 35 and between the inlet 20 and the heater 52, comprises a disc 78 of suitable sheet metal reenforced centrally by ribs 79 and secured centrally by rivets 80 to the fan hub 81 which is fixed at 75 to the motor shaft 33. Peripherally, the fan or impeller disc 78 has a plurality of radial cuts 82 and the metal freed by these cuts is rounded or depressed centrally rearwardly, as shown, to provide a plurality of pocket-like impeller blades 83. The shape, size, number and positioning of these impeller pockets may, of course, vary, depending upon the air output desired. These blades or pockets 83, however, slope forwardly from the rear freed edges 85 toward the plane of the disc 78 at 86 and their rounded formation is at substantially right angles to this slope, thereby providing effective blades for receiving the air through the openings 88 and impelling or forcing same forwardly through the device, as already described. Marginally, the impeller is provided with a frame and reenforcing ring 90, which is folded back upon itself, as shown in Fig. 2, with the forwardly turned marginal edge of the impeller gripped between the folded sides of the ring 90.

The switch 28 is preferably of the type disclosed in my co-pending application, Serial No. 72,647, filed December 2, 1925, and has an arm or finger piece 92 for the lamp circuit, a second arm or fingerpiece 93 for the heater circuit, a third arm or finger piece 94 for the motor circuit, and a fourth arm or finger piece 95 for changing the speed of the motor from slow to fast, or vice versa, each of the arms or finger pieces 92, 93 and 94 having an "Off" and "On" position, as indicated in Fig. 1. The current supply conductors are indicated at 96 in Fig. 1. These conductors 96 may be connected with any suitable source of current, and they enter the switch box 28 and are suitably connected with the switch mechanism therein. The conductors between the switch mechanism and the lamp 36 are indicated at 97 in Fig. 2 and the conductors between the switch mechanism and the heating coil 52 are indicated at 98.

The socket 100 for the lamp 36 is supported upon the inner end of a stem 101, having a knob or finger piece 102 at its opposite end. The stem 101 passes through a sleeve or bushing 103 which is threaded externally and split longitudinally, and threaded upon this sleeve 103 is a nut 104. By threading the nut 104 from the bushing 103, or, at least, out sufficiently to free the same, the stem 101 is free to slide in the bushing 103, and by this sliding movement the position of the lamp 36 may be varied or adjusted and clamped in any suitable or definite position by again tightening or threading the nut 104 up upon the sleeve 103. The socket 100 passes through an opening 106 in the reflector 35.

For oiling the forward motor shaft bearing 108 (Fig. 2), a tube 109 communicating therewith extends radially and is turned at 110 out through the screen 22 so that suitable oil may be introduced therein and will be conveyed to the bearing 108.

The conductors leading from the switch mechanism to the lamp 36 and heater 52 and the opening in the bottom of the switch box through which these conductors enter the switch housing, are covered by a cover 112. The cover 112 is in the form of a pan and also covers the opening 113 through which the conductors enter the drum 5. At one end the cover 112 has a lug 114 which is engaged and held by a clamping piece 116 on the sleeve 103 and at its opposite end this cover 112 has a lug which may be secured by a screw 118 to the bottom of the switch box 28.

I claim:—

1. In a drier, the combination of a casing having an annular discharge passage extending longitudinally with an inlet at one end and an outlet adjacent the opposite end, and means for blowing a stream of air through said annular passage and from said outlet, said passage being of continuously diminishing section from end to end with its largest section at the inlet end and the smallest section at the outlet end.

2. In a drier, the combination of a casing having an annular discharge passage of conical form extending longitudinally with the end of largest section at the inlet and the end of smallest section at the outlet, and means for blowing a stream of air through said annular passage and from said outlet.

3. In a drier, the combination of a casing having an annular discharge passage extending longitudinally and opening adjacent the outlet of the drier, means for blowing a stream of air through said annular passage and from said outlet, and means in said annular discharge passage for preventing circular motion of the stream of air.

4. In a drier, the combination of a casing having outer and inner walls forming an annular discharge passage extending longitudinally and opening adjacent the outlet of the drier, said inner wall terminating short

of the outer wall at the outlet, and means in said annular discharge passage for preventing circular motion of the stream of air.

5. In a drier, the combination of a casing having outer and inner walls forming an annular discharge passage extending longitudinally and opening adjacent the outlet of the drier, said inner wall terminating short of the outer wall at the outlet and said inner and outer walls being generally conical and tapered to reduce the annular passage gradually toward the outlet, said passage having its largest section at the inlet and its smallest section at the outlet, and means for preventing circular motion of the stream of air.

6. In a device of the class described, the combination of a casing having a discharge tube with internal longitudinal fins for directing the air in a straight line and preventing circular motion thereof, and an inner wall positioned and supported within said discharge tube by said fins and forming an annular discharge passage between it and the discharge tube.

7. In a device of the class described, the combination of a casing having a discharge tube with internal longitudinal fins for directing the air in a straight line and preventing circular motion thereof, an inner wall positioned and supported within said discharge tube by said fins and forming an annular discharge passage between it and the discharge tube, and a reflector mounted at the inner end of said inner wall and secured thereto.

8. In a device of the class described, the combination of a casing having a discharge tube with internal longitudinal fins for directing the air in a straight line and preventing circular motion thereof, and an inner wall positioned and supported within said discharge tube by said fins and forming an annular discharge passage between it and the discharge tube, said discharge tube and inner wall being generally conical and correspondingly tapered to reduce the annular discharge passage toward the outlet, and the outlet end of the inner wall terminating short of the outlet end of the discharge tube.

9. In a device of the class described, the combination of a casing having an outer tapered discharge tube, a reflector mounted in said casing with its periphery spaced from the interior of the casing, an inner tapered tube extending substantially concentrically within said outer tube from the periphery of the reflector and forming an annular discharge passage, and means rearwardly of the reflector for blowing air around the reflector and through said annular passage, said passage being of continuously diminishing section from end to end with its largest section at the inlet end and its smallest section at the outlet end.

10. In a device of the class described, the combination of a casing having an outlet, means for blowing a stream of air therethrough, means for guiding the air and preventing whirling of same within the casing, and a reflector mounted directly upon and supported by said last means.

11. In a drier, the combination of a casing, a reflector within said casing and spaced peripherally therefrom, and means rearwardly of and extending forwardly around the reflector for guiding the air and preventing whirling of same.

12. In a device of the class described, the combination of a casing having a discharge tube with internal longitudinal fins for directing the air in a straight line and preventing circular motion thereof, an inner wall positioned and supported within said discharge tube by said fins and forming an annular discharge passage between it and the discharge tube, a reflector mounted within the casing with its periphery spaced therefrom, means rearwardly of the reflector for blowing air around the reflector and through said annular passage, and means also rearwardly of the reflector for guiding the air and preventing whirling of same.

13. In a drier, the combination of a casing having an annular passage, means for blowing a stream of air through said passage and means in said annular passage for preventing swirling and circular motion of the air in its movement through said passage.

14. In a device of the class described, the combination of a casing having an outlet, means for blowing a stream of air therethrough, a reflector, means for guiding the air and preventing whirling of the same within the casing, said guiding means being formed at its forward end to conform with the rear of the reflector and extending forwardly around the back of the reflector, and means fastening the reflector directly to said guiding means.

In witness whereof, I hereunto subscribe my name this 6th day of January, A. D., 1928.

WILLIAM MEYER.