

[54] HAIR DRYER WITH ROTARY BRUSH

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[58] Field of Search..... 132/9, 11 R, 11 A, 85,  
132/112; 310/50; 34/97, 91

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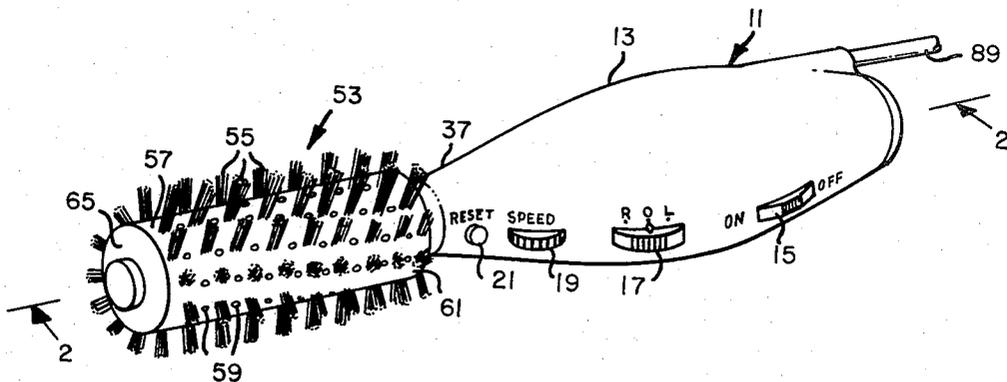
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Primary Examiner—G. E. McNeill  
Attorney, Agent, or Firm—Phillips, Moore,  
Weissenberger, Lempio & Strabala

[57] ABSTRACT

The invention is a rotary brush-hair dryer combination. Air is heated and propelled from the handle of a grooming implement outwardly through a fixed conduit. The air exits from the conduit through a slot which extends from near the end of the conduit furthest from the handle to adjacent the handle. The slot is restricted in size so that the hot air leaves the conduit and is directed throughout a limited angle. Interchangeable tubular brushes are provided which fit over the conduit. The brushes communicate rotatably with a motor within the handle. A number of holes are provided adjacent where the bristles join the brush so that the hot air which flows from the slot in the conduit can flow out primarily through those of the openings opposite the slot. A switch on the handle allows for change of direction of rotation or for shutting off rotation completely. The implement includes an overload switch which will stop rotation of the brush when hair becomes entangled in it. An accessible reset button is also provided for the overload switch.

3 Claims, 5 Drawing Figures



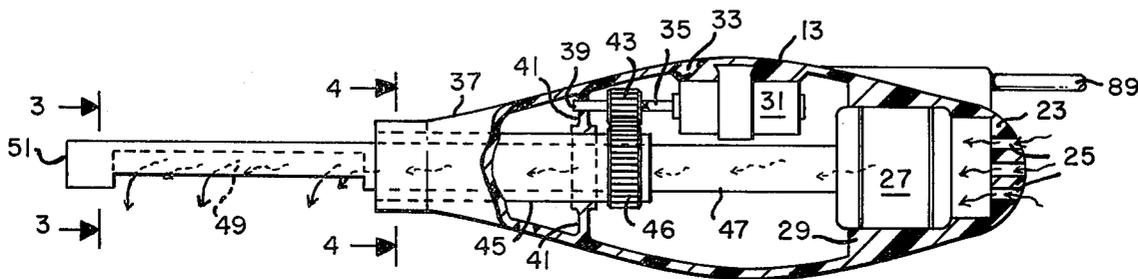
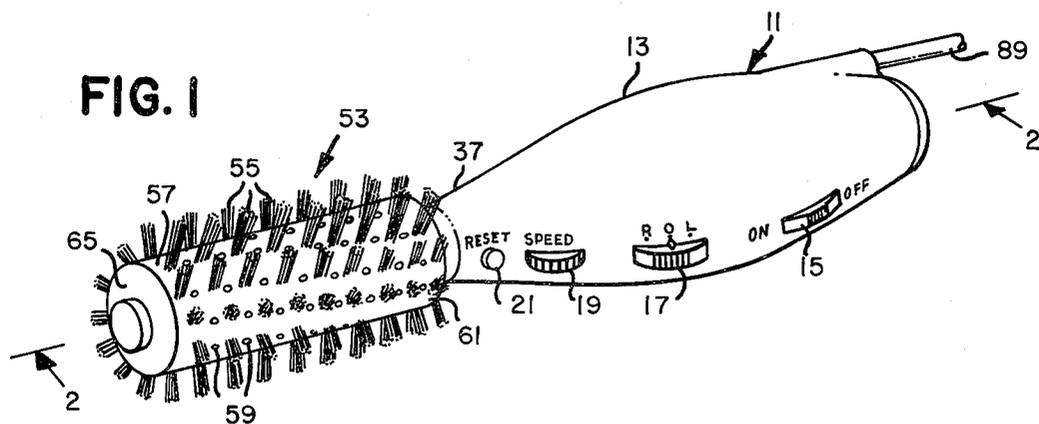


FIG. 2

FIG. 3

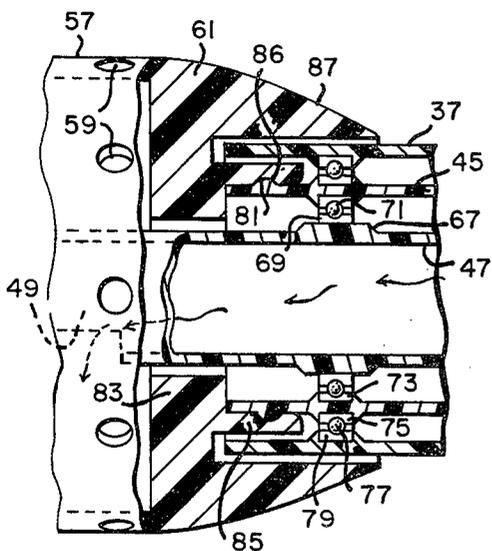
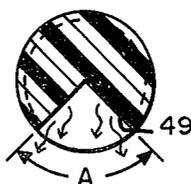


FIG. 5

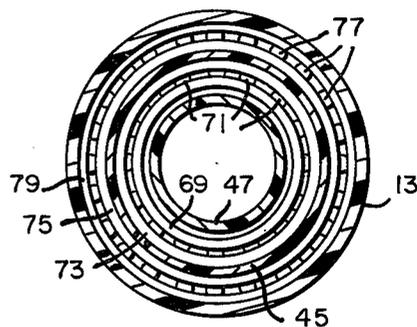


FIG. 4

**HAIR DRYER WITH ROTARY BRUSH**

The invention relates to the field of hair drying and hair brushing implements.

**PRIOR ART**

The prior art discloses a number of hair drying and hair brushing implements. Of interest in this regard are U.S. Pat. Nos. 3,224,454; 3,265,075; 3,386,185; 3,459,199; 3,491,774; 3,563,250; 3,599,345; 3,613,257; 3,721,250 and 3,731,694.

The above-listed patents cover a number of devices useful in the styling of hair. Some of the patents disclose in one way or another the use of brushes, combs or the like through which hot air can be flowed. Some of the patents disclose apparatus for flowing hot air into or around curlers.

U.S. Pat No. 3,459,199 discloses a teasing and unsnarling implement which contains a variable speed adjustor and a reversing switch to control the direction of rotation of the teeth of the implement but does not disclose the introduction of hot air onto the hair that is being teased or unsnarled.

U.S. Pat. No. 3,491,774 discloses a hair grooming device where hot air is drawn through the handle into a rotating drum, the rotating drum having a frictional porous outer surface. This patent does not disclose, however, the concept of directing the hot air against a particular portion of the rotating drum, the use of a reversing switch to control the direction of rotation of the drum, the provision of a variable speed adjustor, the provision of brush length bristles on the exterior of the drum, or the provision of a resettable overload switch.

It would be highly desirable if a combination hair drying and rotary brushing implement was available wherein the hot air expelled by the implement would be directed so that a greater portion of the hot air would serve to dry the portion of the hair that is being contacted by the rotating brush. It would be further advantageous if such an implement included means for reversing the direction of rotation of the brush and for varying the speed of rotation of the brush. It would be still further advantageous if the brush included an overload cutoff which would stop rotation of the brush responsive to the high resistance to rotation which can occur when hair becomes entangled in the bristles of the brush. It would be still more advantageous if such a brush were available with interchangeable brush portions so that different members of a family could hygienically utilize the same handle and hence the same heater fan and motor, thereby reducing the cost of the implement to the family.

These and other advantages of the invention are attainable with the implement of the present invention.

**SUMMARY OF THE INVENTION**

The invention comprises a combination hair drying and rotary brushing implement. The implement comprises a hollow handle including therein a heater, a fan and a motor. A conduit is non-rotatably mounted longitudinally to the handle in position to receive a flow of hot air from the heater and the fan. The conduit has a longitudinal slot commencing adjacent the end thereof furthest from the handle and terminating short of the handle. The slot serves to direct the hot air directionally outwardly therefrom in a limited angle. A brush adapted to fit externally around the conduit also forms

a part of the implement. The brush comprises a tube having bristles extending from the external cylindrical surface thereof, the tube further having a plurality of openings therethrough adjacent the bristles, the tube rotatably communicating at one end thereof with the motor and being substantially concentric with the conduit.

The implement preferably includes means for selecting the direction of rotation of the brush, the direction of rotation selecting means being mounted on the handle. The implement further preferably includes means within the handle for stopping the rotation of the brush responsive to high resistance to rotation thereof as when hair becomes entangled in the bristles of the brush. Still further, the implement preferably includes means mounted on the handle for manually restarting rotation of the brush after the rotation has been stopped responsive to high resistance to rotation. Also the implement preferably includes means mounted on the handle for manually stopping rotation of the brush. It is further preferred that the implement includes means mounted on the handle for manually stopping and starting the heater and the fan. Still further, it is preferred that means be included for varying the speed of the motor. It is also preferred that the implement be further characterized in that the brush detachably communicates at the one end thereof with the motor whereby a plurality of brushes are usable with a single handle.

**BRIEF DESCRIPTION OF THE DRAWING**

The invention will be better understood by reference to the drawing in the figures of which like numbers denote like parts throughout and wherein:

FIG. 1 is a perspective view illustrating the preferred embodiment of the invention.

FIG. 2 comprises a partial section view taken along line 2—2 of FIG. 1.

FIG. 3 comprises a section view taken along line 3—3 of FIG. 2.

FIG. 4 comprises a section view taken along line 4—4 of FIG. 2.

FIG. 5 illustrates in partial section view a detail in the construction of the preferred embodiment of the invention.

**DESCRIPTION OF THE PREFERRED EMBODIMENT**

The preferred rotary hair styler 11 of the invention includes a hollow handle 13 which includes thereon on-off switch 15, direction of rotation selector 17, speed control 19 and overload reset button 21. The hollow handle includes at the one end 23 thereof an opening 25 therein which serves to allow entry of air into the handle.

The air which enters the hollow handle 13 via the opening 25 passes first into the fan and heater unit 27, the direction of flow of the air being shown by the arrows in FIGS. 2, 3 and 5. The fan and heater unit is held in place within the handle by the shoulder 29.

Also mounted interiorly of the handle 13 is the electric motor 31. The motor is mounted to the interior of the handle at the ridge 33. A motor shaft 35 extends from the motor toward the brush end 37 of the handle. The motor shaft adjacent the end thereof 39 furthest removed from the motor is rotatably held by a circular hole in the annular support 41. The motor shaft is driv-

ably attached to the gear 43, said gear in turn being drivably attached to the hollow drive shaft 45 by the drive gear 46. The hollow drive shaft is held in place and aligned by the same support which rotably holds the motor shaft and which is integral with the interior of the handle.

A conduit 47 is mounted to the fan and heater unit 27 in position to receive the flow of hot air therefrom and to conduct this hot air as shown by the arrows in FIG. 2 through the hollow center portion of the drive shaft 45. The conduit extends out the brush end 37 of the handle 13 as illustrated in FIG. 2. The conduit has a longitudinal slot 49 which commences adjacent the end 51 of the conduit furthest from the handle. The slot terminates short of the handle as is illustrated most clearly in FIGS. 2 and 3. Hot air from the fan and motor unit passes through the conduit and out the slot in a directional manner and through a limited Angle, A.

A brush 53 comprising bristles 55 attached to a tube 57, the tube having a plurality of openings 59 there-through adjacent the bases of the bristles is illustrated in FIG. 1. The tube communicates rotatably at one end 61 thereof with the drive shaft 45 which in turn is driven by the gears 43 and 46, the shaft 35 and the motor 31. It is clear that the tube is substantially concentric with the conduit 47 and is adapted to fit externally around the conduit. The openings in the tube are adapted to receive the flow of hot air which exits from the conduit via the slot 49. Due to the directional flow of air from the slot it is possible to more completely utilize the hot air by always contacting the portion of the brush opposite the slot with the hair being brushed. The brush at the other end 65 thereof is adapted to rotatably and removably fit over the end 51 of the conduit of the brush. Thus, a plurality of brushes can be snapped in place over the conduit.

FIGS. 4 and 5 illustrate in detail how the brush 53 is attached adjacent the handle 13. The conduit 47 has an annular ring 67 which has mounted concentrically and externally thereto the first ball bearing holding channel 69. A first plurality of ball bearings 71 are mounted within the first channel. Opposite the first channel is the mating second ball bearing holding channel 73 which is attached internally of the drive shaft 45. Thus, the first plurality of ball bearings are held between the first and second channels. Externally of the drive shaft there is a third ball bearing holding channel 75 which is adapted to hold a second plurality of ball bearings 77. Externally of the second plurality of ball bearings and internally of the brush end 37 of the handle there is a mating fourth ball bearing holding channel 79 whereby the second plurality of ball bearings are held between the third and fourth channels. The drive shaft and the brush end of the handle each terminate adjacent the four channels.

Attached to the drive shaft 45 externally thereof is the annular ridge 81. The tube 57 has attached interiorly thereof the shoulder 83. Attached to the shoulder is the ring 85 which is adapted to fit between the drive shaft and the brush end 37 of the handle 13. The ring includes a snap on channel 86 adapted to fit over the ridge in a mating fit whereby the drive shaft causes the tube to rotate in consort therewith. The tube adjacent the end 61 thereof also includes a lip 87 which fits over the brush end of the handle thereby assuring that hair cannot become caught in the interior of the handle. The brush 53 can be removed from the handle by sim-

ply grasping the handle in one hand and the brush in the other and pulling the two members apart whereby the ring slides off of the ridge. It is preferred that the handle and the tube are of a resilient material, e.g., plastic, so that the snap fit can be easily attained.

The switch 17 is provided on the handle 13 as a means for selecting the direction of rotation of the brush. As will be noted from reference to FIG. 1, the switch 17 can be put in any of the positions, R, O or L. The position R could correspond to a rotation in one direction; the position L to a rotation in another direction; and the position O to no rotation at all. The speed of the motor 31 is controlled by the speed control 19. Thus both the direction and speed of rotation of the brush 53 is easily controllable by the user of the hair styler 11. The on-off switch 15 in the off position renders the styler completely inoperable other than as a manual hair brush. When the on-off switch 15 is in the on position, power is available to the motor and to the fan and heater unit 27. When the load on the motor becomes too great as, for example, when high resistance to rotation of the brush results (for example, from hair becoming entangled in the brush) then power to the motor is cut off as by a circuit breaker and must be restarted through pushing the reset button 21. The electric wire 89 serves its usual purpose.

The hair styler of the present invention provides a number of highly desirable features. It provides a brush which is rotatable at a desired speed and in a desired direction and further provides means for directionally flowing hot air against a portion of the interior of the brush whereby the hot air will be efficiently used to dry that portion of the hair that is being brushed. The implement also provides a capability for operation when the brush is not being rotated, that is, when only the fan and heater portions are operating. This can be useful in delicate styling operations wherein rotation of the brush would be undesirable. The styler further provides means for stopping the rotation of the brush responsive to high resistance to rotation thereof as when hair becomes entangled in the bristles of the brush. Thus, a person whose hair is being brushed is saved from possible serious pain. Since the direction of rotation of the brush can be selected, the stylist does not need to work at some times from the front of the head and at other times from the back of the head as would be the case if reversal of rotation were not available. The variation in speed of the brush is useful for brushing different parts of the hair and for brushing hair of different persons which would provide different resistance to brushing. Finally, the ability to use a plurality of brushes with a single heating and rotating unit is highly desirable since the most expensive part of the styler is the motor and heater unit and thus, a number of persons can hygienically use the styler by each using their own brush portion. Further, since the air which is pulled into the fan heater unit 27 is guided outwardly therefrom through the conduit 47, the motor 31 which turns the brush 53 is protected from this hot air and has a reduced tendency to overheat.

While the invention has been described in connection with specific embodiments thereof, it will be understood that it is capable of further modification, and this application is intended to cover any variations, uses or adaptations of the invention following, in general, the principles of the invention and including such departures from the present disclosure as come within

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known or customary practice in the art to which the invention pertains and as may be applied to the essential features hereinbefore set forth, and as fall within the scope of the invention and the limits of the appended claims.

I claim:

1. A combination hair drying and rotary implement, comprising:

a hollow handle including therein a heater-fan unit and a motor;

a conduit non-rotatably mounted longitudinally adjacent one end of the handle and positioned to accept a flow of hot air from the heater-fan unit and guide the hot air so it does not contact the motor, the conduit having a longitudinal slot commencing adjacent the end of the conduit removed from the handle and terminating short of the handle, the slot serving to direct the hot air directionally outwardly through a limited angle from the slot; and

a brush comprising a tube having bristles extending from the external cylindrical surface thereof, the tube further having a plurality of openings there-through adjacent the bristles, the tube rotatably communicating at one end thereof with the motor,

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the tube being substantially concentric with the conduit and being adapted to fit externally around the conduit, said tube detachably communicating with said motor whereby a plurality of brushes are usable with a single handle, means within said handle for automatically stopping the rotation of said brush responsive to high resistance to rotation thereto as when hair becomes entangled in the bristles thereof, and, on said handle, means for selecting the direction of rotation of said brush, means for manually starting rotation of said brush after rotation has been stopped responsive to high resistance thereto, means for manually stopping rotation of said brush, and means for manually stopping and starting said heater-fan unit.

2. An implement as in claim 1, including means mounted on the handle for manually controlling the speed of rotation of the brush.

3. An implement as in claim 1, including a lip on the handle which fits over the end of the handle adjacent the brush to prevent hair from being caught in the interior of the handle.

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