Oct. 11, 1938. L. A. CARTER 2,133,078

HAIR DRIER

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FIG. 2.

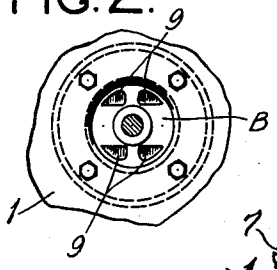
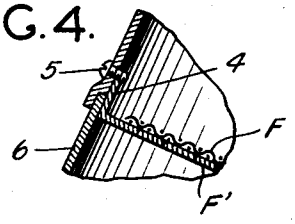


FIG. 1.

FIG. 3.

FIG. 4.



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HAIR DRIER

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3 Claims. (Cl. 34—26)

This invention relates to hair driers of the so-called re-circulating type, that comprise a hood inside of which more or less of the user's head is positioned, and means for re-circulating heated air over the user's hair.

The objects of my invention are, to provide a hair drier of the re-circulating type, that will dry hair rapidly and thoroughly; that is economical in the consumption of electrical energy used to heat and re-circulate the air; that is quiet in operation and comfortable to the user; and which is of neat appearance, inexpensive construction and simple design.

Briefly described, my improved hair drier consists of a hood having a single chamber constructed so that it may be arranged in such relationship with the user's head that the top and back portions of the head will be positioned inside of said chamber, an air heating means in said hood, and a fan in said hood constructed and disposed in such relationship with the side wall of said chamber that when the fan is in operation, a vortex or partial vacuum will be created at approximately the central portion of said chamber, which tends to lift the hair from the user's scalp, and the air inside of said chamber will be directed onto the scalp and hair, then passed over or through the heating means, and then re-circulated in contact with the hair or hair and scalp. I prefer to employ a hood having a single, slightly tapered chamber provided at one end with an opening that receives the head of the user and also constitutes an air inlet and air exit for said chamber, and employ a fan which is of such design and arrangement with relation to the side wall of the chamber of the hood, that when the fan is in operation, a stream of air under a relatively high pressure and velocity will travel forwardly in a helical path along the inner surface of the side wall of said chamber, and will then cascade onto the user's hair and scalp and flow in the reverse direction, or rearwardly, back to the fan, said returning air being heated by contact with one or more electrically-operated heating elements arranged preferably at or adjacent the point where the air is drawn into the center of the fan.

Figure 1 of the drawing is a vertical longitudinal sectional view of my improved hair drier.

Figure 2 is a transverse sectional view, taken on the line 2—2 of Figure 1.

Figure 3 is a transverse sectional view, taken on the line 3—3 of Figure 1; and

Figure 4 is a sectional view, taken on the line 4—4 of Figure 3.

In the accompanying drawing which illustrates one form of my invention, A designates as an entirety a hood having a single chamber, preferably tapered slightly and provided at one end with an opening that is adapted to receive the head or part of the head of the user, as shown in Figure 1. Said hood is provided at its opposite end with an end wall *f* that has an electric motor B mounted on the exterior of same. The motor B drives a fan C which is arranged inside of the hood, and one or more electrically-operated heating devices D are arranged inside of the hood for heating the air set in motion by the fan. Said fan and hood are of such construction and arrangement that when the fan is in operation, a vortex or low pressure area will be created at approximately the center of the chamber in the hood, and a high pressure area of swirling air will be created at or adjacent the inner surface of the side wall of said chamber, thereby causing air to be projected forwardly in a swirling path at a relatively high pressure and velocity, as indicated by the arrows *x* in Figure 1, and then reverse and flow rearwardly back to the fan, as indicated by the arrows *y* in Figure 1. Due to the fact that the vortex or partial vacuum at the center of said chamber tends to lift the hair from the user's scalp, thorough and rapid drying of the hair is effected by the heated air discharged forwardly by the fan. Centrifugal force establishes the pressure of the air, and the forward axial movement of the air relatively to the hood is governed by the angle of the inner face of the side wall of the chamber of the hood contacted by the air projected forwardly by the fan. As the fan draws air from the direction in which the forwardly-projecting air travels, a vortex or partial vacuum will be created at approximately the center of the chamber in which the user's head is positioned. The initial velocity and pressure of the forwardly moving air is constantly diminished by natural retarding influences, and the inner strata of air become susceptible to the pull of the vortex, which results in the movement of air in swirling cascade effect towards the center of the chamber of the hood. As previously explained, the vortex has a tendency to lift the hair from the scalp, thus permitting the air cascading inwardly to satisfy this partial vacuum, to come in contact with the scalp and circulate efficiently through the hair. If desired, the hood may be provided at its front end or open end with an inwardly-projecting flange or other element E that tends to enhance the swirling cascade effect on substantially all the air that reaches the point of

relatively low vortex pull, the edge of said flange being encased in an annular cushioning device or pad E' that surrounds the user's head with a sufficiently loose fit to permit sufficient air to enter and escape from the open end of the chamber of the hood to prevent the air in said chamber from becoming saturated with moisture, or heated to a temperature that is annoying to the user. Although the flange E completes the swirling cascade effect of the heated air towards the center of the chamber in which the user's scalp and hair are positioned, said flange is not relied upon to reverse the direction of flow of the air and cause the air to be returned to the fan. Instead, the reversal in the direction of flow of the air is attained by designing or proportioning the fan and the side wall of the chamber of the hood, so that the vortex or partial vacuum created by the fan will exert a pull on the forwardly flowing air and cause the air to cascade towards the center of said chamber before reaching the opening in the end of same in which the user's head is positioned.

Any type or kind of fan that will produce the action or effect previously described may be used. In the drier herein illustrated the fan C is of the conoidal type and is provided with a solid or imperforate back plate 2 instead of a spider or skeleton-like blade supporting element. The blades 3 project forwardly from said back plate 2 and are disposed so that when the drive shaft revolves, air will be drawn inwardly at the center of the front side of the fan, and then discharged forwardly in the form of a band of relatively high pressure, rotating within the chamber of the hood at a relatively high speed. Instead of using a fan provided with a solid or imperforate back plate, as herein illustrated, the same result can be attained by arranging a stationary, transversely-disposed partition inside of the chamber of the hood, behind a fan equipped with a blade supporting element of spider form or skeleton construction. A disk-shaped screen or guard F formed of wire mesh or similar material is arranged inside of the chamber of the hood in front of the fan, as shown in Figure 1. The peripheral edge of said guard is spaced away from the inner surface of the side wall of the chamber of the hood, and said guard is sustained preferably by a supporting member F' of skeleton construction, provided with a plurality of laterally-projecting ears or lugs 4 that are connected to the side wall of the hood by fastening devices 5, as shown in Figure 4. The heating element or elements D, previously mentioned, which are arranged in the path of flow of the air drawn into the fan, are sustained by an insulator G, which is attached to the center of the supporting member F', as shown in Figure 1. Any suitable means may be used to control the electrical energy supplied to the motor B and to the heating devices D, the drier herein illustrated being equipped with a control switch H mounted on the exterior of a guard housing I that encases the motor B. As previously stated, the hood A may be constructed in various ways without departing from the spirit of my invention. Said hood is herein illustrated as being made up of an open-ended, tapered sheet metal shell 6 whose rear end is attached by fastening devices 7 to the rim of a substantially cup-shaped casting 8 that encases the fan and serves as a supporting means for the motor B, which is mounted on the exterior of the end wall 1 of said casting, as previously explained. In order to prevent the motor from overheating, air ports 9 are preferably formed in the end portions of the casing of the motor, and air ports 9^a are formed in the motor guard housing I, so as to cause air to be drawn through the field windings of the motor by the action of the fan C when the drier is in use.

A hair drier of the construction above described is an improvement on conventional hair driers of the re-circulating type, in that it provides the requisites for intimacy and frequency of contact between air and hair, necessary for rapid and thorough drying of the hair. It differs in principle of operation from prior or conventional re-circulating hair driers, in that it comprises a single chamber that receives the head of the user and in which a relatively high pressure of swirling air is created at the inner surface of the side wall of the chamber, and a low pressure area is created at the center of said chamber, thereby causing the heated air to act uniformly and evenly on the user's hair, due to the fact that some of the air starts to cascade inwardly adjacent the center of the chamber, and thus contacts the hair on the crown of the user's scalp. It differs in construction from prior re-circulating hair driers, in that the hood, instead of consisting of a double walled structure provided with numerous air inlet and discharge ports, consists of a single straight walled shell having a single chamber provided at one end with an opening that receives the head of the user and also acts as an air inlet and air exit for the chamber, in which the user's head is positioned, said opening being of such size that sufficient air is admitted to and discharged from the hood to avoid overheating the air and saturation of the air beyond a point of effectiveness as a drying medium.

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

1. A hair drier, comprising a hood having an unobstructed interior devoid of a part that cooperates with the side wall of the hood to form an air circulating passageway, said hood having an opening in which the user's head is adapted to be positioned so as to cause the hair thereon to be arranged within the unobstructed interior of said hood, an air heating means in said hood, and an air circulating fan in said hood, said fan being of such construction and the side wall portion of said hood being of such shape and arrangement with relation to the fan, that the conjoint action of said fan and side wall causes air on the interior of said hood to swirl forwardly adjacent the inner face of said side wall, then flow inwardly and cascade onto the user's head before reaching the front end of said hood, and then flow rearwardly over the heating means and back to the intake of the fan.

2. A hair drier, comprising a hood provided at one end with an opening in which the user's head is adapted to be positioned so as to cause the hair thereon to be arranged inside of said hood, said hood having an unobstructed interior bounded by a straight line, tapered side wall, a fan arranged inside of said hood adjacent the closed end of same, and a heating means arranged inside of said hood adjacent the intake of said fan, the said fan being disposed in such relationship with the head-receiving opening and the tapered side wall of the hood that said fan, when in operation, causes the air within the hood to flow forwardly through a high pressure area at the side wall of the hood, and then rearwardly through a low pressure area at the center of the hood,

which tends to raise the hair from the user's scalp and also cause the forwardly flowing air to cascade onto the scalp.

3. In combination, a shell, a hood secured at one end to one side of said shell, an impeller disposed within said shell and having a plurality of peripheral generally axially extending vanes lying relatively closely adjacent the interior walls of said shell, said impeller being adapted thereby to project the air within the hood in a helical stream along the inner periphery of the hood toward the open end thereof and to draw air inwardly along the central axis of said hood, and heater means carried within said vanes and in said axis for raising the temperature of the air drawn inwardly toward said impeller.

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