July 26, 1932. P. KUNIAN ET AL 1,869,012

HAIR DRIER

Filed Dec. 14, 1929

Fig. 1

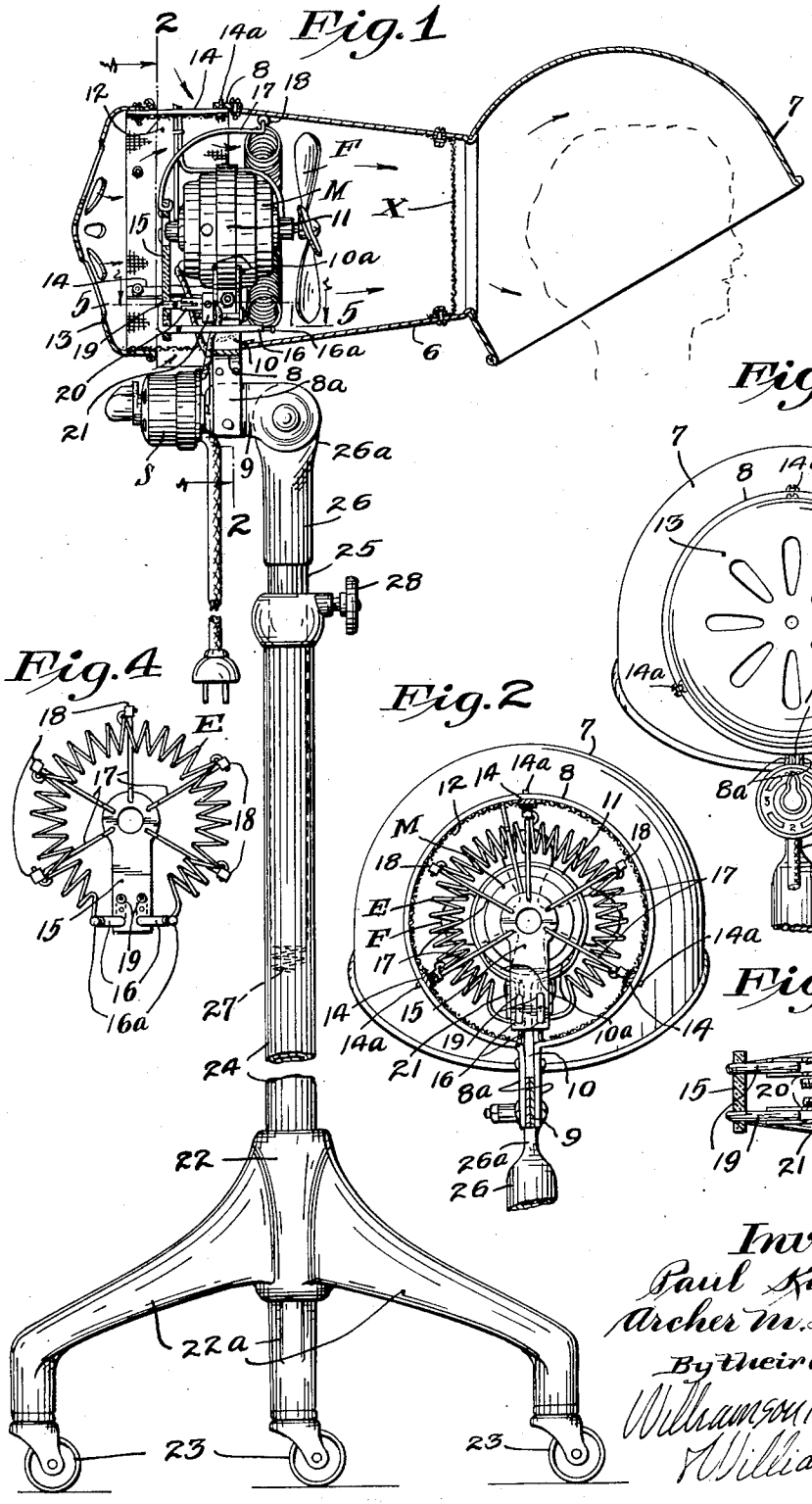


Fig. 3

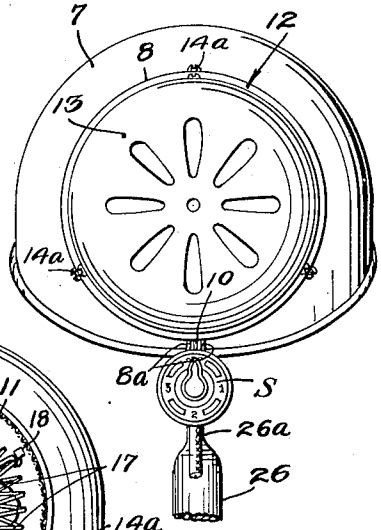
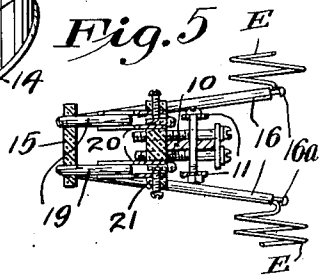


Fig. 4

Fig. 2

Fig. 5



Inventors
Paul Kunian
Archer M. Douglas
By their Attorneys
Williamson Reif
Williamson

Patented July 26, 1932 1,869,012

UNITED STATES PATENT OFFICE

PAUL KUNIAN, OF MINNEAPOLIS, AND ARCHER M. DOUGLAS, OF ST. PAUL, MINNESOTA; SAID DOUGLAS ASSIGNOR TO SAID KUNIAN

HAIR DRIER

Application filed December 14, 1929. Serial No. 414,033.

This invention relates to hair driers of the type wherein a stream of air is projected against the scalp through a casing having a heating element therein.

It is an object of our invention to provide an improved and simplified hair drier of high efficiency which may be produced at low cost.

It is a further object to provide a hair drier wherein the air after being heated will be thoroughly mixed before projection against the scalp, the heating element being arranged annularly behind the fan or impeller and of substantially the diameter of the fan, whereby the same will act as an efficient mixer, as well as a means for projecting the air against the scalp.

It is a further object to provide a hair drier as above described, wherein the intake of air will be relatively non-restricted and unlimited and whereby the discharge of air will be somewhat restricted in order that particles of heated air will be thoroughly admixed with the particles of unheated air before projection upon the scalp.

Still another object is to provide a hair drier, wherein the heating element and mounting for the same may be readily removed for repair or replacement without necessitating disconnection of bolts, screws or electric wires.

These and other objects of the invention will be fully set forth in the following description made in connection with the accompanying drawing wherein like reference characters refer to similar parts throughout the several views and wherein,

Fig. 1 is a view mostly in side elevation of an embodiment of our invention, showing the casing and confining hood in vertical section taken longitudinally of the casing;

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

Fig. 3 is a rear elevation of the casing;

Fig. 4 is a front elevation of the heating element and its mounting detached; and

Fig. 5 is a horizontal section taken on the line 5—5 of Fig. 1 showing the manner in which the mounting for the heating element is attached.

The embodiment of the invention illustrated in the drawing includes an open ended tubular casing 6, tapering from its rear to its forward end, the said forward end having suitably secured thereto an enlarged dome-shaped hood 7, which is adapted to surround a scalp. Hood 7 may be attached to casing 6 by providing the dome with a circular aperture leaving a circular flange of proper diameter to snugly fit the forward end of casing 6. The forward edge of said casing may be pressed outwardly about the said circular flange making a rigid connection therewith. Casing 6 may be provided at its rear end with a reinforcing band 8 of substantially heavy material, terminating in a pair of depending vertical members 8*a* which may be rigidly fixed to a short swingable bracket 9. A suitable electric motor M is mounted at the rear end of casing 6 with its armature shaft extending concentrically of said casing and the case of motor M may be rigidly connected with the head 10*a* of a T-shaped member 10, the stem of said T being clamped between or rigidly affixed to the depending members 8*a*. The motor may be further secured by means of a clamping band 11 encircling the motor casing and secured to the stem of member 10. The armature shaft of motor M projects forwardly into casing 6 and has fixed thereto a suitable fan or impeller F, the length of the blades thereof being slightly less than the radius of casing 6 at the portion of the casing in which the fan is disposed.

Adjacent the forward end of the casing, a netting or screen X is transversely disposed, restricting slightly the projection of air through the casing and forming a guard to prevent the operator or person treated from

inadvertently projecting the hands or hair into the revolving fan.

A cup-shaped detachable rear or intake end for our hair drier is provided and this may comprise an open ended cylinder 12 constructed of relatively heavy grill or netting and adapted to be telescoped within the reinforcing band 8 at the rear of the casing and a reticulated cap member 13 rigidly secured to the rear edge of said netting. It will, of course, be obvious that the entire rear end of the casing, including elements 12 and 13 may be constructed integrally from a cup-shaped piece of sheet material provided the end and cylindrical portion of the cup-shaped member are perforated or reticulated to such an extent that the intake of air will be substantially unrestricted.

It will be noted that the cup-shaped intake end of our casing houses the rear portion of the motor casing, thereby economizing on the material needed for casing 6 and also facilitating the connection or disconnection of the mounting for the heating element.

We prefer to provide means for quickly detaching the rear end of the casing, and while any suitable means may be utilized we have illustrated for this purpose a plurality of forwardly extending spring fingers 14 connected at their rear ends to the cap member 13 and having small outwardly projecting pins 14*a* at their forward ends which are adapted to engage apertured portions of the reinforcing band 8 when pressed inwardly.

We provide a detachable heating element, which may be readily removed from the casing for repair or replacement without necessitating disconnection of bolts, screws or electric wires. A heating element E is arranged and mounted in annular shape and is disposed directly behind the fan F and preferably surrounds the forward end of motor M for the purpose of compactness and also to cause efficient heating of the air. The detachable mounting for the heating element may comprise an upstanding insulated plate 15 carrying at its lower end a pair of forwardly and substantially horizontal conductors 16, which may be in the form of tubes. The extremities of the heating element E are secured to the forward ends of conductors 16 in suitable manner and this may be effected by projecting the said extremities into the ends of conductors 16, (if the conductors are tubular) and by wedging pins 16*a* into the open ends against the said extremities of the heating element. The heating element is held in annular shape by means of a series of curved arms 17, which extend radially and forwardly from the upper end of insulating plate 15, the inner ends of said arms being insulated by connection with said plate, as clearly shown in Fig. 4. Radial arms 17 may be constructed from resilient material, and as shown have turned outer extremities on which small pads 18, of insulating material are secured, said pads being adapted to engage the interior of casing 6 to assist in supporting the heating element and to prevent short circuiting thereof. Conductors 16 are connected with a pair of forwardly and horizontally extending terminals 19 projecting from plate 15 a short distance above said conductors, and said terminals may be tubular and as shown formed integrally with conductors 16. Terminals 19 detachably telescope within a pair of split tubular electric receiving terminals 20 which may be secured in an insulating block 21 and which project rearwardly and horizontally therefrom, said block being rigidly mounted upon the rear of the T-shaped motor supporting member 10. The receiving terminals 20 are electrically connected by suitable service wires with the electric motor and with the heating element. Electrical circuits through the heating element and motor are made through a suitable electrical switch S the contacts of which are preferably so arranged that the fan motor may be operated independently of the heating element or both may be operated together.

Our drier casing, as illustrated, is supported from a suitable upright standard, which may comprise a pedestal or base 22 having diverging legs 22*a*, which may be supported upon castors 23. An upright tube 24 is rigidly secured at its lower end to base 22 and has telescoped in the upper portion thereof a post 25. Post 25 may carry a head 26 at its upper end, terminating in a substantially flat attachment tongue 26*a* to which the bracket 9 is swivelly and frictionally secured. The lower end of the post 25 may float upon a coiled spring 27 disposed within the lower portion of tube 24 and reacting against the closed end of base 22. A hand wheel, set screw or other suitable device 28 may be provided at the upper end of tube 24 for rigidly securing post 25 in a desired vertical position with reference to the tube 24.

Operation

In operation, assuming the electrical circuit through the motor and heating elements to be closed, a substantially unrestricted intake of air through the rear of the casing is effected, due to the cup-shaped member comprising elements 14 and 12, both of which are reticulated. As indicated by the arrows in Fig. 1, air is drawn into the casing axially thereof through cap member 13 and also laterally or radially of the casing through the cylindrical grill or netting 12. Most of the air passes between the motor case and the drier casing and consequently is impinged against the annularly arranged heating element E directly at the rear of the fan. Particles of air are thus effectively heated before they strike or pass through fan F. A small

amount of air will be drawn by the fan through the interior of the motor, cooling the same.

It will be noted that the fan is disposed in the medial and tapered portion of the casing and in addition to projecting the air through the casing disintegrates and admixes the heated particles of air with the unheated particles, the air passing through the forward portion of the casing under some pressure due to the tapering of the casing and the transverse guard netting 11. The air is, therefore, discharged within the confining hood 7 with some force and is distributed by said hood over and about the scalp of a person to be treated.

Due to the admixture and agitation of the heated particles of air by the fan within the restricted portion of the casing, the temperature of the air at different points within the hood will be substantially the same, and consequently a uniform drying of the hair is effected with our device.

The cup-shaped and perforated rear end of the drier casing may be quickly removed by disengaging the pins 14*a* from the apertured portion of reinforcing band 8, rendering accessible the motor, fan and heating element for cleaning, dusting or repair. The heating element and its mounting may be easily removed from within the casing by merely disengaging the forwardly extending electric terminals 19 from the tubular receiving sockets or terminals 20. This is conveniently accomplished by grasping the central portion of the insulating plate 15 and drawing it rearwardly away from the motor. Cool air may be projected against the scalp by turning the switch indicator to position 2 as illustrated in the drawing, thereby closing only the circuit through the motor fan.

In most driers on the market at this time the restriction of the intake end of the casing and relation between the intake end and forward portion of the casing produces a swift centrifugal swirling motion of the air delivered in the confining hood. This results in objectionable "dead air spots" within the hood, preventing the uniform drying of the hair.

With our device, the intake of air is substantially unrestricted, due to the cup-shaped rear end of the casing which is perforated axially and circumferentially and the forward end is slightly restricted. The swirling motion of the air is minimized due to this structure and combination and exhaustive tests have shown that throughout the entire area of the hood there are no "dead air spots" and the temperature is substantially uniform.

From the foregoing description it will be seen that we have provided an extremely simple but highly efficient hair drier which may be produced at low cost, which is compact in structure requiring a relatively small amount of material and which, due to the added function of the fan in thoroughly mixing the heated and unheated particles of air passing through the casing, insures a uniform and rapid drying of the hair.

What is claimed is:

1. In a hair drier, a tubular casing having an air discharge passage at its forward end, and an open rear end, a fan or impeller for projecting air through said casing, a heating element arranged annularly within said casing, and a detachable mounting for said heating element comprising a vertical plate, a series of resilient arms connected with the upper portion of said plate and extending radially and forwardly thereof, said arms being connected with said heating element, a pair of forwardly extending electric terminals connected with said heating element and a pair of complementary electric terminals mounted in the rear of said casing and projecting rearwardly with which said first mentioned terminals may be detachably connected, the outer ends of said arms yieldingly engaging the interior of said casing and cooperating with the connection between said terminals to retain said heating element and mounting in operative position within said casing.

2. In a hair drier, a tubular casing having a relatively large air intake passage at its rear end and tapering from its rear to its forward end, a motor mounted axially within said casing and a fan secured to the forward end of the armature shaft of said motor, a heating element mounted in said casing just rearwardly of said fan and surrounding the forward end of said motor, and a cup-shaped member detachably secured to the rear edge of said casing and having a multiplicity of circumferentially arranged intake apertures in the body thereof and a series of air intake apertures in the rear wall thereof adapted to permit a substantially unrestricted intake of air and a portable standard supporting said casing.

3. In a hair drier, a casing having an air intake opening at its rear end and an air discharge passage at its forward end, a fan or impeller mounted in said casing for projecting air, a heating element in the rear of said casing and a detachable mounting for said heating element comprising a plate, a series of arms secured to said plate and extending outwardly therefrom connected at their outer ends with said heating element to arrange the same annularly within said casing, said arms being provided with insulating elements at their outer ends adapted to yieldingly engage the interior of said casing to detachably secure said element and a detachable closure connected with the rear end of said casing.

4. In a hair drier, a portable standard, a supporting ring secured to the upper end of said standard, a tubular casing, the rear end of which is secured to said ring and supported thereby, a motor disposed axially of said casing and secured to said supporting ring, a fan connected with the armature shaft of said motor, a heating element disposed within said casing and a cup-shaped closure member detachably connected with the edge of said supporting ring and enclosing said motor, said closure having a multiplicity of air entrance apertures.

In testimony whereof we affix our signatures.

PAUL KUNIAN.
ARCHER M. DOUGLAS.