June 11, 1935. J. E. KELLEY 2,004,488

DRIER

Filed April 29, 1933

Fig. 1.

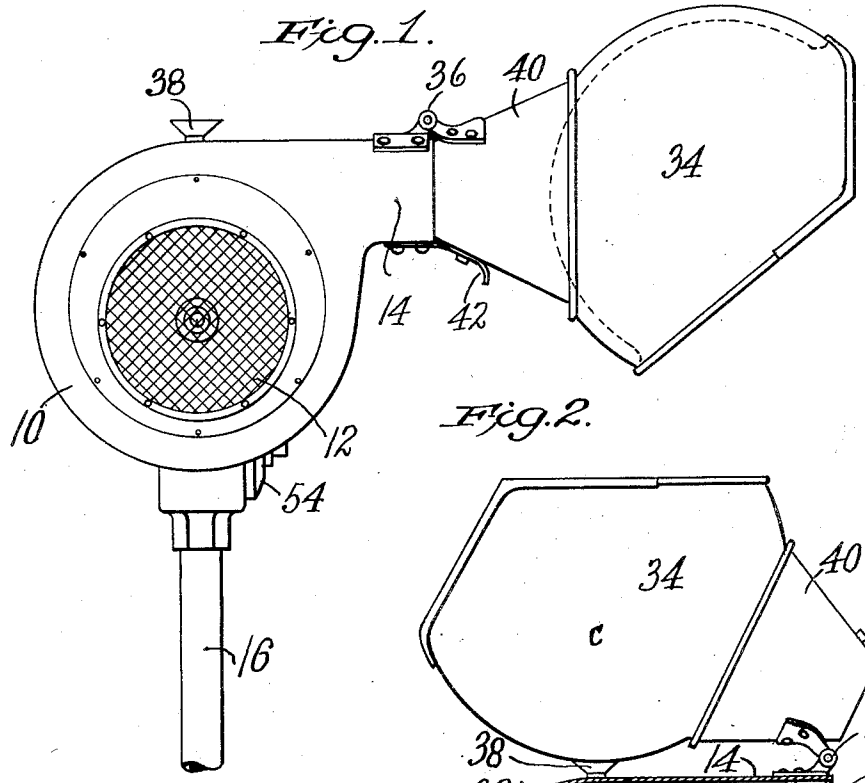


Fig. 2.

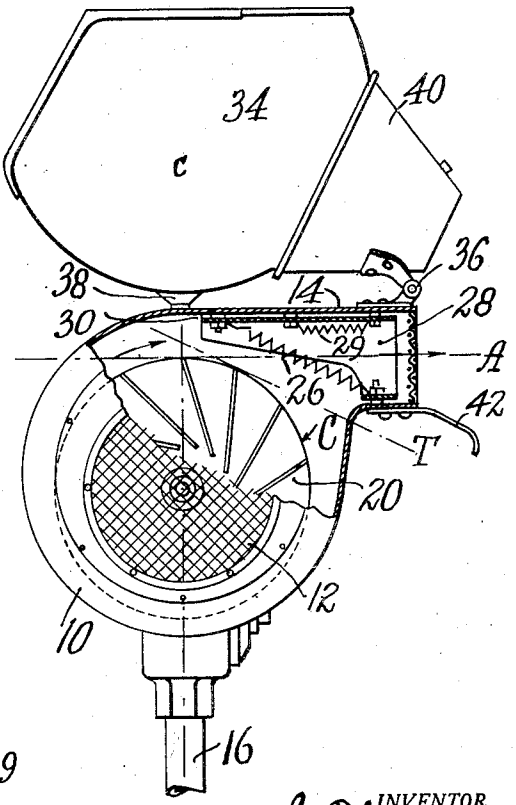
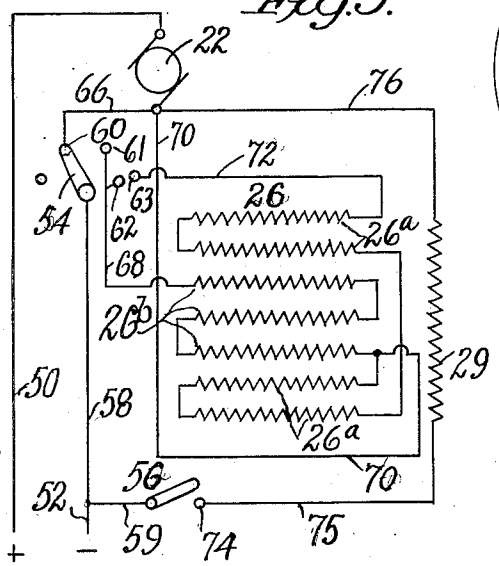


Fig. 3.



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DRIER

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Application April 29, 1933, Serial No. 668,546

1 Claim. (Cl. 219—39)

This invention relates to driers of the type used for drying parts of the person, and particularly for drying hair, and provides improvements therein.

In drying hair the aim is to do the drying in a minimum of time. In general this is best accomplished by providing the drier with a hood which partially envelopes the head and distributes air (usually heated) to the parts of the head corresponding to the scalp. The hair at and below the neck is however not so quickly dried, when a hood is used, as the hair around the head. Rapidity of drying the hair as a whole is therefore best accomplished by first using the hood and thereafter directing air from a delivery tube onto the parts of the hair which remain undried after the use of the hood, and driers with a delivery tube having a hood displaceably connected thereto have been provided so as to enable the several modes of drying to be performed by one drier or apparatus.

The present invention provides an improved drier. It provides a drier having a compact arrangement of fan, casing, delivery-tube and heater; and further provides a compact, stable and efficient drier having a delivery-tube and a hood displaceably connected thereto. The invention further provides a drier having a variable speed fan in which a resistance unit in a circuit to the fan motor, is located in the delivery tube of the fan.

Other features of improvement are set forth in the detailed description which follows:

An embodiment of the invention is illustrated in the accompanying drawing, wherein:

Fig. 1 is a side elevation showing the displaceable hood in its position of use.

Fig. 2 is a view partly in side elevation and partly in section, with the hood displaced and in the position where the air discharges directly from the delivery tube.

Fig. 3 is a diagram of the circuits of the fan motor and resistance heaters.

Referring to said drawing, numeral **10** designates a fan casing having an inlet **12** and a discharge tube **14**.

Numeral **16** designates part of a stand or pedestal of a suitable type, forming the support for the drier.

Numeral **20** designates the fan, which is located within the casing **10**, and is preferably of the centrifugal type. The fan **20** is preferably driven by an electric motor **22**.

Numeral **26** designates a heater. The heater preferably comprises a plurality of heater-coils **26ª**, **26ᵇ**. The coils **26ª**, **26ᵇ** are preferably arranged in the circuit in two groups, in multiple (or it may be in more than two groups), as hereinafter more fully described.

To obtain compactness, the coils of the heater **26** are arranged proximate the fan-circle C and are preferably arranged substantially parallel to a tangent T to the fan-circle C with a substantial portion of the length thereof extending over the fan **20**. The axis A of the delivery tube **14** is also preferably arranged substantially tangential to the fan-circle C, the tangent T crossing axis A. The coils of the heater **26** run diagonally across the delivery tube **14** from a point adjacent the inner end of the tube **14** toward the top center of the fan-casing, and by the arrangement described extend over the fan **20** for a substantial portion of the length thereof and are brought close to the vertical plane extending upward from the axis of the fan in a manner which is effective both from the standpoint of compactness and from the standpoint of heat-interchange. The aforesaid arrangement admits of the heater being located in a delivery tube and at the same time the delivery tube made much shorter than heretofore with its end less than two radii of the fan from the vertical plane running through the axis of the fan. To admit of the coils of the heater **26** being assembled as a unit, the said coils may be mounted upon a diagonally sliced tube **28** which is arranged to be inserted and fastened in the delivery tube **14**. The resistance coil **29** in the circuit of the motor **22**, hereinafter more fully described, is also preferably mounted upon the sleeve **28**. The sleeve **28** is preferably spaced slightly from the tube **14** as indicated at **30**, to admit of a flow of air between the sleeve **28** and the casing **14** to limit the heating of the latter.

Numeral **34** designates a hood adapted to partially surround the head, and to direct and distribute the air onto the hair on that part of the head corresponding to the scalp. The hood **34** is displaceably connected to the delivery tube **14** as by means of the hinge **36**.

The hood is placed in communication with the delivery tube by placing it in the position as shown in Fig. 1. To deliver air directly from the delivery tube **14**, the hood **34** is turned back, on the hinge **36**, to the position shown in Fig. 2. It is desirable to deliver air directly from the delivery tube **14** to hasten the drying of parts of the hair which remain undried after the parts of the hair within the hood have been dried.

To provide for stability, the hinge **36** is so arranged that the center *c* of the hood **34**, when

the hood is turned back onto the casing 10, is substantially over the vertical center line of the L of said casing. The casing 10 may be provided with a cushion 38 to support the hood 34 when the latter is turned back in the position shown in Fig. 2. With a short delivery tube 14, as heretofore described, and with a short funnel 40 on the hood 34, the over-hang of the hood 34 in the position shown in Fig. 1 may be very considerably reduced as compared with hood driers heretofore used. As much reduction in the hood section is effected as is obtained in the shortened delivery-tube, so that the saving in length in the delivery-tube is doubled in the overall over-hang. The advantage of a short over-hang, by the construction heretofore described, may be obtained in a hood drier in which the hood is not displaceable. The short over-hang is also important in conserving space in beauty-parlors where space is restricted.

A latch 42 may be provided for holding the hood in communication with the delivery tube 14.

Operation

Referring to Fig. 3 current is conducted to the motor 22 from one side of the line by a lead 50. Lead 52 connects with the other side of the line. The current in the circuit is controlled by switches 54 and 56 which connect with lead 52 through conductors 58, and 59 respectively.

The switch 54 has four live contacts 60, 61, 62, and 63. Contact 60 is connected with the motor 22 by a conductor 66. The contact 61 connects the motor 22 and the group 26^b of the heating coils, in series, the circuit being traced as follows: switch 54, contact 61, conductor 68, heating coils 26^b and conductor 70.

The contacts 62, 63 connect the two groups of heating coils 26^a, 26^b, in multiple, with the motor 22. The contact 62 is connected with the conductor 68 which also leads to the contact 61, and the circuit from the switch 54 through the group of heating coils 26^b to the motor 22 is the same as when the switch makes contact with the contact 61. The circuit through the switch 54 to the motor 22 through the heating coils 26^a is from contact 63, conductor 72, heating coils 26^a to conductor 70 and by conductor 70 to the motor 22.

The circuit from the switch 56 to the motor 22 is by contact 74, conductor 75, resistance coil 29, and conductor 76.

When it is desired to have a gentle stream of air from the drier, the switch 56 is closed. The resistance 29 is such that the motor 22 turns at a relatively low speed, and there is consequently a gentle stream of air forced through the delivery tube by the fan 20. The incidental heat from the resistance coil 29 located in the delivery tube is transferred to the air. A gentle stream of air is desirable when it is desired to dry hair which has been waved or dressed.

To obtain a strong stream of warm air, the switch 54 is turned to the contact 61. In this position of switch 54, the motor 22 is run in series with the group of heating coils 26^b, and the air forced through the delivery tube 14 coming into contact with the coils 26^b, moderately heated.

To obtain a strong stream of air which is considerably warmed, the switch 54 is turned to make contact with the contacts 62, 63. This places all of the heating coils of the heater 26 in circuit, current flowing to the motor 22 in multiple through the two groups 26^a, 26^b.

It will therefore be seen from the foregoing that the drier may be used to supply air issuing directly from the delivery tube 14, or through the hood 34. This air may be supplied under four conditions: (1) a strong stream of unheated air, when the switch 54 is on the contact 60; (2) a gentle stream of slightly heated warm air, when the switch 56 is on the contact 73; (3) a strong stream of moderately warm air when the switch 64 is on the contact 71; and (4) a strong stream of very warm air, when the switch 64 is on the contact 62, 63.

The invention may receive other embodiments than that herein specifically illustrated and described.

What is claimed is:

A drier of the character described comprising a fan casing, a rotary fan in said casing, a tangential delivery-tube, an electrical heating element, a diagonally sliced tube in which said heating element is mounted, said heating element and sliced tube extending over said fan for a substantial portion of its length diagonally across said delivery tube from a point adjacent the inner end of said tube to a point at the top of said casing adjacent a point directly over the axis of the fan.

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