

Oct. 22, 1935.

L. J. WAHL

2,017,929

HAIR DRIER

Filed July 3, 1933

2 Sheets-Sheet 1

Fig. 1

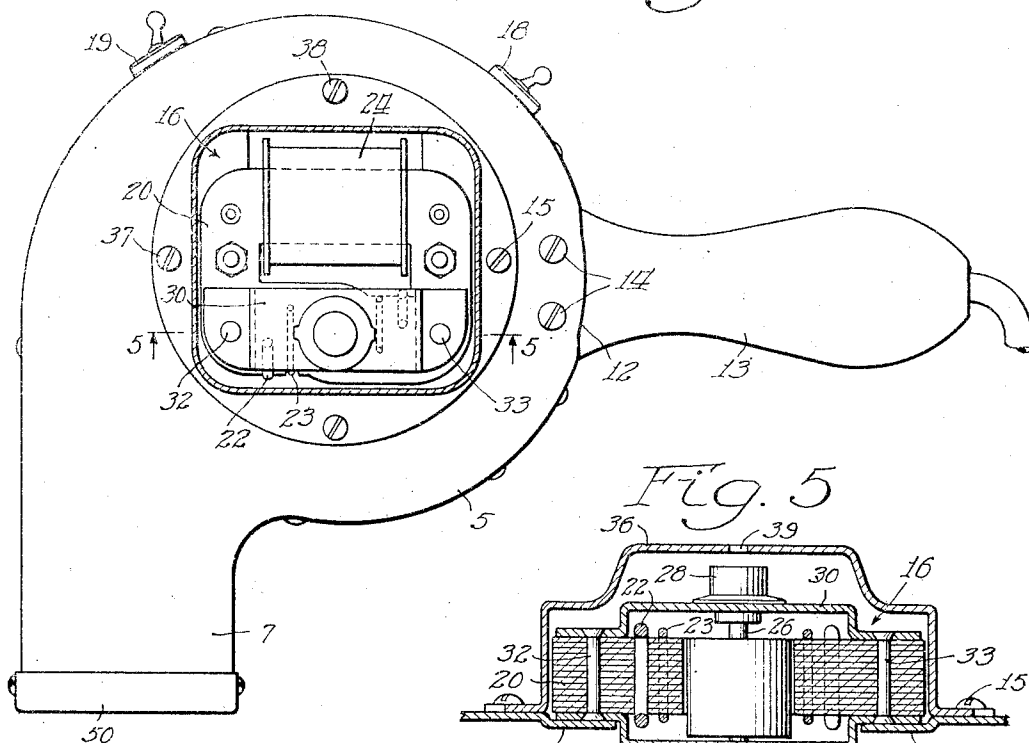


Fig. 5

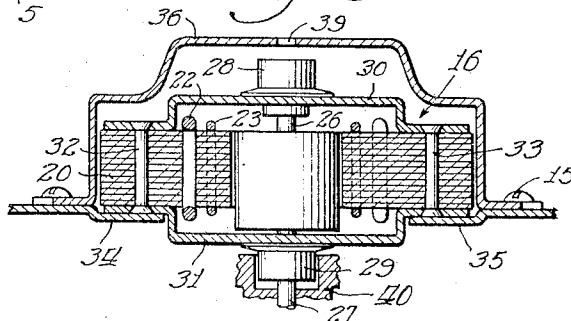
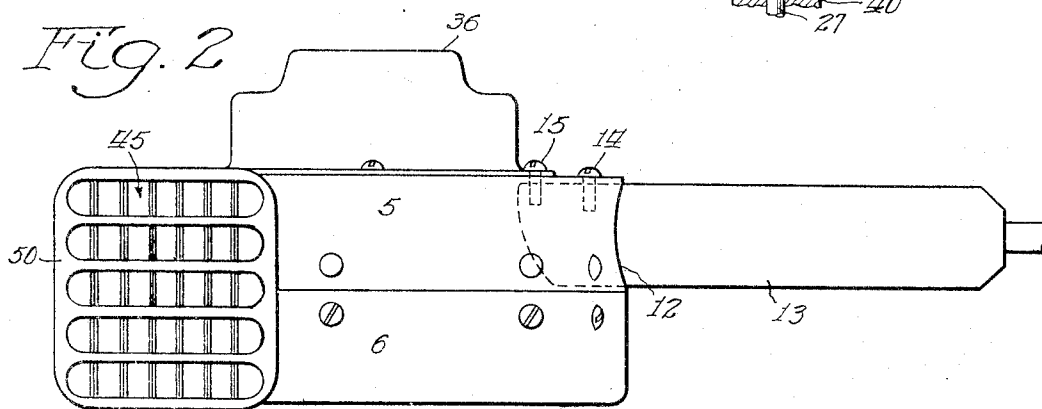


Fig. 2



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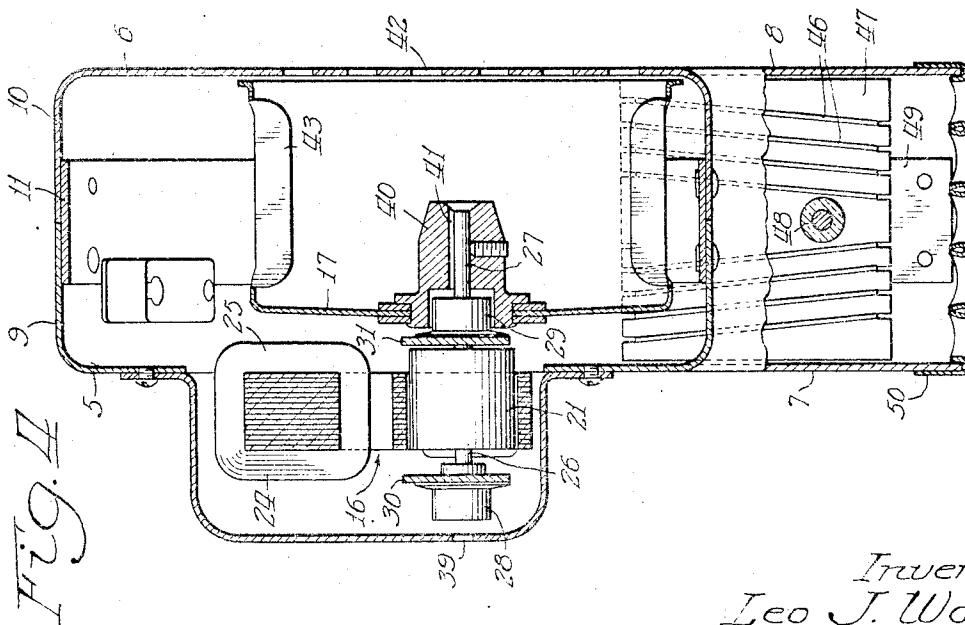
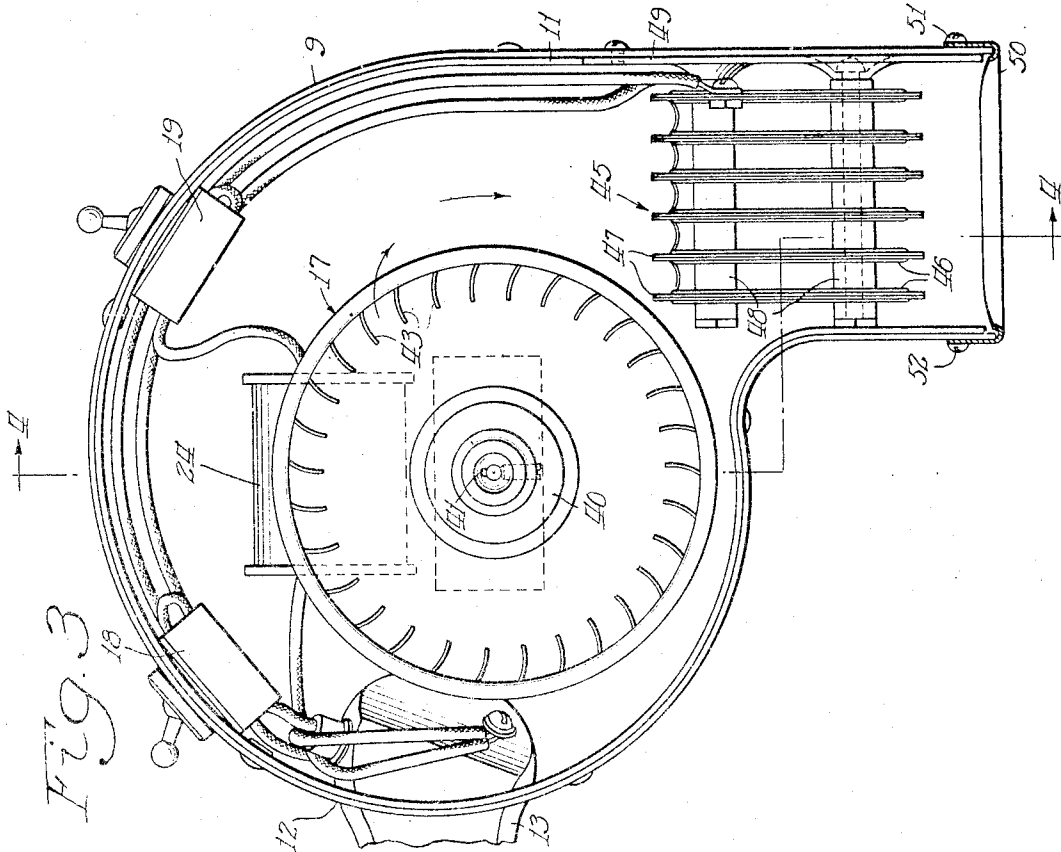
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HAIR DRIER

Filed July 3, 1933

2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

2,017,929

HAIR DRIER

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Application July 3, 1933, Serial No. 678,819

7 Claims. (Cl. 34—26)

My invention relates to hair driers and has for its principal object the provision of a novel combination between a casing drier unit and fan of a portable hair drier whereby the weight of the device can be reduced and at the same time the assembly of the parts considerably simplified so as to make a better and more economical hair drier.

My invention contemplates also a novel combination between the motor and casing which permits the use of a lighter motor than as heretofore been possible because of the peculiar construction that permits the casing to act as a heat radiating vane for the core of the motor. The motor is so mounted on the casing also that the field coil is in the path of air circulation within the casing so as to be cooled in this fashion.

Other and more specific objects and advantages, such as in the mounting of a handle, the specific type of motor used, the relative positioning of the motor with respect to the center of the fan casing, will be more clearly brought out in a detailed description in connection with the accompanying drawings wherein the preferred form of the invention is shown. It is to be understood of course that the drawings and descriptions are illustrative only and are not to be taken as limiting the invention except insofar as it is limited by the claims.

In the drawings—

Fig. 1 is a side view with the motor cover cut away showing the hair drier;

Fig. 2 is a plan view looking upward at Fig. 1;

Fig. 3 is a full size view of the device with one side of the casing removed and with the handle broken away;

Fig. 4 is a section substantially on the line 4—4 of Fig. 3; and

Fig. 5 is an enlarged section on the line 5—5 of Fig. 1.

Referring now in details to the drawings, the hair drier is housed by a casing made up of the two sections 5 and 6 which are substantially circular in plan with tangential extensions at 7 and 8 to provide an outlet from the casing. The two casing sections with the exception of the open end of the extension have peripheral flanges as indicated at 9 and 10 which flanges abut each other to form a substantially closed casing.

One of the casing sections has secured to the inside of the flange thereof the strip 11 which telescopes with the other flange and is secured thereto by suitable screws. This casing has the section 5 thereof provided with the aperture at 12 to receive the handle 13 which may be of any suitable material. The handle 13 is merely ex-

tended into the casing and screwed against the inner wall of the section 5 by means of suitable screws as indicated at 14 and 15. This handle and casing combination makes it unnecessary to provide any particular ferrules or clamping fittings for the handle and materially reduces the cost of the hair drier. The casing section 5 serves also primarily as the mounting section for the equipment that goes into the hair drier such as the motor indicated generally by the numeral 16 10 and its fan 17 together with the control switches 18 for the motor and 19 for the heater.

The advantage of this construction is believed to be clearly apparent by an observation of Fig. 3 since it shows how all the operating parts may be mounted in place in the casing section 5 before the section 6 is applied thereto.

The mounting of the motor on the casing is of considerable importance in the present case since the cooperation between the motor and the casing enable me to use a much lighter motor than would otherwise be possible. From an examination of Figs. 3, 4 and 5, it will be noted that the motor 16 has its core 20 as a closed magnetic circuit with the exception of the armature 21 and 25 shading coils such as 22, 23.

The field coil 24 is wound around a section of the core so that a substantial portion of it extends into the casing 25. This aids the cooling of the coil by exposing it to the circulation of the air 30 in the fan chamber. It will be noted from an examination of Figs. 3 and 4 that the field coil is so spaced from the casing and the core where it loops around the core as to facilitate air circulation about it.

The core itself is mounted directly against the casing as indicated at Fig. 4 and Fig. 5 so that the casing conducts heat away from the core much in the fashion of a radiating vane so as to further the cooling of the motor. In order to 40 be able to utilize this advantage fully, I make the casing of a light non-magnetic material such for example as aluminum which is also a very good heat conductor.

The armature of the motor is mounted by 45 means of its projecting shafts 26 and 27 in the bearings 28 and 29 which are in turn secured to the straps 30 and 31. These straps are secured at their outer ends to the core as by means of the rivets 32, 33, and the casing 5 is offset as indicated in Fig. 5 at 34 and 35 to allow for the ends of the strap 31.

The motor housing 23 fits down over the motor rather snugly and is secured in place by the screw 15 and other screws such as 37 and 38. 55

The bearing 28 is open for oiling through the opening 39. This bearing 28 is a thrust bearing as will be pointed out hereinafter. The bearing 29 receives its oil through the hub 40 of fan 17, this hub being grooved as indicated at 41 along the opening of the shaft 47 so as to allow the oil which can be inserted through the openings 42 in casing 6 to pass into the bearing 29.

The fan used is a standard commercial fan having the blades 43 operating to throw the air outwardly and in the direction of the arrow in Fig. 3 so as to create a current of air out through the outlet provided by portions 7 and 8 of the casing.

Main switch 18 controls both the heater and motor current supply so that the heater cannot be left on with the motor off. It will be noted that switches 18 and 19 are inside the housing but are offset toward the motor side so as not to resist the main flow of the air. This also places the main switch directly opposite the handle where it is convenient for thumb control.

It will also be noted from the examination of Figs. 1, 3, and 4 that the axial center of the fan is offset toward the outlet from the casing center substantially which brings the fan blades closer to the outlet to increase the fan's efficiency and which also balances the weight of the device upon the handle to a better advantage, the field coil 24 being located as indicated at Fig. 3 on the opposite side of the casing center from the fan axis.

The heating element 45 is mounted on the outlet of the casing and consists of heating coils such as indicated at 46 wound upon spaced insulating sheets 47 that are carried by the supporting stems 48, the supporting stems being mounted upon a base plate 49. Base plate 49 is of the same width as the strip 11 and forms an extension thereof as shown clearly in Fig. 3, both casing sections 5 and 6 being secured to this base plate as they are secured to the strip 11.

The heater guard 50 is slipped over the end of the outlet and secured in place by suitable screws as indicated at 51 and 52.

From the above description, it is believed that the construction and operation of this device will be clear to those skilled in this art and the advantages thereof readily apparent.

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

1. A device of the character described comprising a fan casing of thin sheet material having an outlet opening, a fan in said casing, a motor mounted on a side of the casing and having a drive shaft on which said fan is mounted said motor having its field coil offset to one side of the drive shaft projecting into the casing alongside the periphery of the fan and directly exposed to the air circulating in the casing.

2. A device of the character described comprising a fan casing of thin sheet material having an outlet opening, a fan in said casing, a motor mounted on a side of the casing and having a drive shaft on which said fan is mounted said motor having its core mounted on the outside of the casing and directly against the casing wall said casing having an opening beneath the core and said core having a field coil thereon projecting through the casing opening into the fan chamber.

3. The combination in a hair drier of a cas-

ing comprising a pair of complementary cupped sections each substantially circular in plan and provided with a tangential open-ended extension to provide an outlet, one of said sections having a motor mounted thereon said motor having a shaft and a fan on said shaft within the casing, and a heating unit in said outlet said casing having an opening in the circular wall thereof and a handle projecting into said opening and having a portion within the casing secured to the side of one of said sections inwardly from said circular wall.

4. The combination in a hair drier and the like of a casing composed of two opposed cupped sections secured together, each section being provided with an open ended extension to provide an outlet, one of said sections having an opening therein, a motor having a core secured against the outer wall surface of said section, and a field winding on said core, a portion of said winding projecting through the opening into the casing interior, and said motor having its shaft projecting into the casing, and a fan on said shaft within the casing.

5. The combination in a hair drier and the like of a casing composed of two opposed cupped sections secured together, each section being provided with an open ended extension to provide an outlet, one of said sections having an opening therein, a motor having a core secured against the outer wall surface of said section, and a field winding on said core, a portion of said winding projecting through the opening into the casing interior, and said motor having its shaft projecting into the casing, and a fan on said shaft within the casing, said casing having a handle extending into the casing and secured to the side wall of the motor carrying section of the casing.

6. The combination in a hair drier and the like of a casing composed of two opposed cupped sections secured together, each section being provided with an open ended extension to provide an outlet, one of said sections having an opening therein, a motor having a core secured against the outer wall surface of said section, and a field winding on said core, a portion of said winding projecting through the opening into the casing interior, and said motor having its shaft projecting into the casing, and a fan on said shaft within the casing, said motor shaft being closer to the casing outlet than the field winding.

7. The combination of a hair drier and the like of a casing composed of two opposed cupped sections secured together, each section being provided with an open ended extension to provide an outlet, one of said sections having an opening therein, a motor having a core secured against the outer wall surface of said section, and a field winding on said core, a portion of said winding projecting through the opening into the casing interior, and said motor having its shaft projecting into the casing, and a fan on said shaft within the casing, said casing having a handle extending into the casing and secured to the side wall of the motor carrying section of the casing, said handle being extended substantially at right angles to the outlet extensions, and the motor shaft and winding being on opposite sides of the plane of the axis of the handle extended through the casing.

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