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HAIR DRIER

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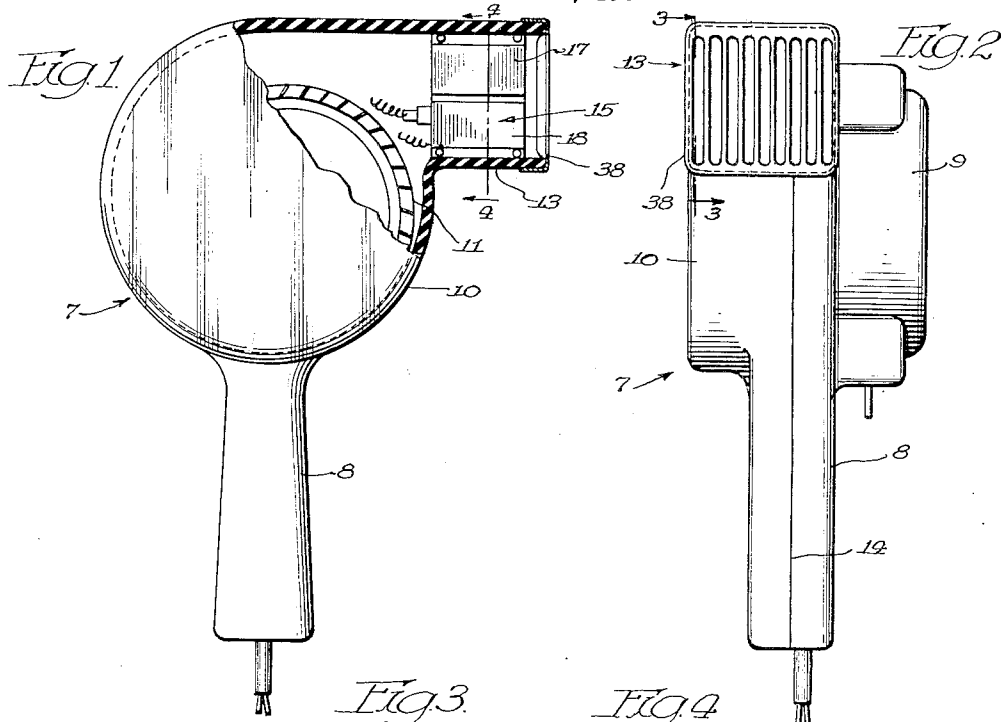
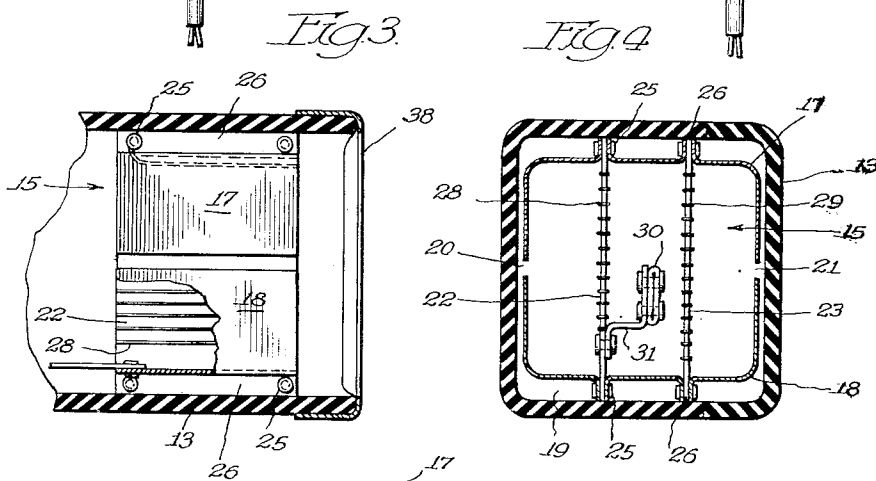
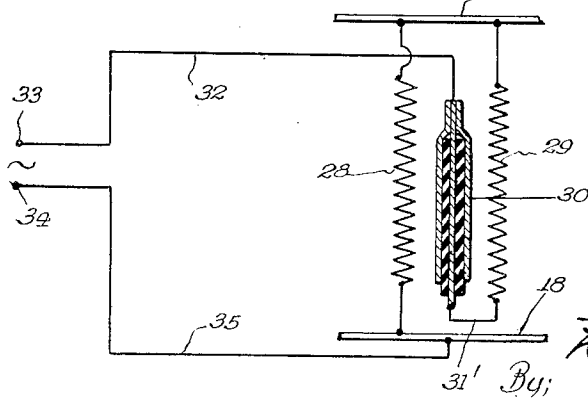


Fig. 5

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HAIR DRIER

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4 Claims. (Cl. 219—39)

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This invention relates to hair dryers, and more particularly to hair dryers of the general type shown in my prior Patent No. 2,017,929, dated October 22, 1935.

At the present time it has been found desirable to use molded plastic material for the outer casing portions of hair dryers. As is well known, most plastic materials are sensitive to heat beyond a certain temperature, and for this reason it is necessary to isolate somewhat the heating elements of the hair dryer from the casing walls. As a further safety measure, it is desirable to provide a thermostatic switch in connection with the heating elements so that the temperatures generated will not exceed a predetermined value.

Accordingly, one object of the invention is to provide a hair dryer having a casing, and particularly the portion thereof that encloses the heating elements, made of plastic material.

Another object contemplates an improved heating unit that is disposed within the air outlet portion of the dryer. The heating unit comprises a heat confining and reflecting structure that defines a chamber open at its ends for the passage of a stream of air. The structure is spaced somewhat from the interior walls of the air outlet portion so as to prevent excessive temperatures from reaching the plastic walls. Electric heating elements are provided within the chamber, and the walls of the chamber serve to reflect the radiant heat energy given off by the heating elements. Thus a maximum amount of heat is available to the stream of air moving through the chamber, and comparatively little heat is transferred to the plastic casing.

Another object is to provide a thermostatic switch in effective relationship with the heating elements. The switch is connected in series with the elements, and when a predetermined temperature develops within the chamber, the switch opens to prevent excessive heating.

Still another object resides in the provision of an improved electrical circuit connecting the heating elements and the thermostatic switch. At least one of the necessary electrical connections is formed by a portion of the heat reflecting structure mentioned above, which structure also may form the support for the heating elements.

Other objects and advantages of the invention will become apparent as the description proceeds, reference being had to the accompanying drawing wherein one form of the invention is shown. It is to be understood that the description and drawing are illustrative only, and are not to be taken as limiting the invention except insofar as it is limited by the claims.

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In the drawing:

Fig. 1 is a view in side elevation of my hair dryer with a portion broken away to show the improved heating unit;

Fig. 2 is an end elevational view of my hair dryer;

Fig. 3 is a sectional view on line 3—3 of Fig. 2;

Fig. 4 is a sectional view on line 4—4 of Fig. 1; and

Fig. 5 is a somewhat diagrammatical view of the circuit used in the heating unit.

Referring now to the drawing, my hair dryer comprises a casing 7 having a reduced handle 8, a motor closure 9 (Fig. 2) and an enlarged blower housing 10. A suitable centrifugal type blower is shown in part at 11 in Fig. 1.

The casing 7 has an air outlet portion 13 disposed in suitable tangential relationship with the blower 11. As mentioned, the casing 7 is preferably made of plastic material, and it may conveniently be molded in two parts, the junction of the two parts being indicated by the line 14 in Fig. 2.

The present invention particularly concerns itself with the heating unit and associated electrical circuit generally indicated at 15. The improved heater unit comprises a pair of oppositely disposed heat reflecting members 17 and 18 preferably made at least in part of metal. As best shown in Fig. 4, the members 17 and 18 have cross-sections substantially similar to the corresponding halves of the cross-section of the outlet portion 13. In the form shown, the outlet portion is square in cross-section, although it is apparent that other desired shapes could be used. Thus the members 17 and 18 are substantially U-shaped in cross-section, the size of the members in section being such that the members may be mounted within outlet portion 13 in spaced relationship with the portion walls. This relationship provides an air space 19 (Fig. 4) between members 17 and 18 and the walls of outlet portion 13. It is also to be noted that the free ends of the members 17 and 18 are spaced from each other as shown at 20 and 21, this spacing being provided to secure electrical separation of the members.

The length of members 17 and 18 correspond generally with the length of outlet portion 13. It will be seen, therefore, that members 17 and 18, when mounted in position within outlet portion 13, define a chamber open at its ends for the passage of a moving stream of air. The air space 19 surrounding the chamber provides thermal insulation and also an air path to hasten heat dissipation.

The heating elements themselves comprise

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sheets of insulating material 22 and 23 extending between the members 17 and 18 and thus lying within the chamber. More or less than two heating elements may be used if desired, although the two elements as shown have been found satisfactory in most instances.

As best shown in Fig. 4, the members 17 and 18 each may be made in three parts, the adjacent edges of the respective parts being provided with flanges that engage the ends of insulating sheets 22 and 23. Suitable rivets 25 extend through the flanges and sheet ends as shown in the drawing. The flanges and embraced sheet ends form ribs 26 that engage the walls of outlet portion 13 to provide the aforesaid air space 19.

Resistance wires 28 and 29 are coiled in a spiral manner around the respective insulating sheets 22 and 23. As shown in Fig. 5, corresponding ends of wires 28 and 29 are connected to the plate 17, the plate thus forming an electrical connection between the two wire ends.

A thermostatic switch 30 of any suitable type is mounted by means of a bracket 31 (Fig. 4) to one of the insulating sheets so that the switch lies between the two heating elements. The switch is set to de-energize the circuit when heated above a predetermined value, such, for example, as 150°. Excessive heat would be developed in this region so as to cause switch action if for example the blower motor stopped operating. During motor operation, the blower capacity and the characteristics of the resistance wires are such that the temperatures are maintained at safe values.

Referring to Fig. 5, switch 30 is connected in series with the resistance wires 28 and 29. Thus, in addition to the wires 28 and 29—plate 17 connections mentioned above, one switch terminal has a connection with the other end of resistance wire 29, the connection being numbered 31' since it conveniently may be established by the switch supporting bracket 31. The other switch terminal has a lead 32 extending to one power input terminal 33, while the other power input terminal 34 is connected by lead 35 to the other end of resistance wire 28. This latter connection may include a portion of metallic member 18 as shown in Fig. 5.

A suitable grill 38 extends across the open end of air outlet portion 13 for the sake of safety and appearance.

During operation of my hair dryer, a moving stream of air generated by rotating blower 11 passes through the chamber defined by members 17 and 18. The radiant heat developed by resistance wires 28 and 29 warms the air which then becomes available for hair drying purposes. As mentioned, the members 17 and 18 reflect the radiant heat inwardly of the chamber to thus avoid over-heating of the plastic walls of outlet portion 13. Heat that does pass through the members 17 and 18 is dissipated without damage to the casing walls by virtue of the air streams that pass through the air space 19 between the walls and the members 17 and 18. As a further safety measure I have provided thermostatic switch 30 adapted to break the heating circuit if for any reason the temperature should exceed a predetermined safe value.

From the above description it is thought that the construction and advantages of this invention will be readily apparent to those skilled in the art. Various changes and modifications may be made without departing from the spirit or losing the advantages of the invention.

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

1. In a hair dryer including a casing having an air outlet portion made of plastic material, the combination therewith of a heater and associated electrical circuit disposed within said outlet portion and adapted to transfer a predetermined amount of heat to a moving stream of air, said heater and associated circuit comprising a pair of oppositely disposed metallic heat reflector members, said members having cross-sections substantially similar to corresponding halves of the cross-section of said outlet portion, a pair of spaced insulating sheets each extending between said reflector members and maintaining the adjacent ends of said members in spaced relation, ribs on said members for spacing the members from the walls of said outlet portion, resistance wire coils around each insulating sheet, a thermostatic switch disposed between said coils with one switch terminal connected to an end of one coil, the other end of said coil being connected to its adjacent heat reflector member, the corresponding end of the other coil being connected to the said adjacent heat reflector member, the other end of said last named coil and the other switch terminal forming power input terminals.

2. In a hair dryer including a casing having an air outlet portion made of plastic material, the combination therewith of a heater and associated electrical circuit disposed within said outlet portion and adapted to transfer a predetermined amount of heat to a moving stream of air, said heater and associated circuit comprising a pair of oppositely disposed metallic members conforming generally in cross-section to said outlet portion, a pair of spaced insulating sheets each extending between said metallic members and maintaining the adjacent ends of the members in spaced relation, means spacing said members from the walls of said outlet portion, resistance wire coils around each insulating sheet, a thermostatic switch disposed between said coils, said coils and said switch being series connected with one of said metallic members forming the connection between coils.

3. In a hair dryer including a casing having an air outlet portion made of plastic material, the combination therewith of a heater and associated electrical circuit disposed within said outlet portion and adapted to transfer a predetermined amount of heat to a moving stream of air, said heater and associated circuit comprising a heat confining and reflecting structure defining an open ended chamber having walls at least in part spaced from the walls of said outlet portion, at least one insulating sheet extending through the interior of said chamber, resistance wire coils around said insulating sheet, a thermostatic switch disposed within said chamber, said coils and said switch being connected to each other in series.

4. In a hair dryer including a casing having an air outlet portion made of plastic material, the combination therewith of a heater and associated electrical circuit disposed within said outlet portion and adapted to transfer a predetermined amount of heat to a moving stream of air, said heater and associated circuit comprising a pair of spaced oppositely disposed metallic members conforming generally in cross-section to said outlet portion, a pair of spaced resistance heating elements each extending between said

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metallic members, a thermostatic switch disposed in proximity to said heating elements, said elements and said switch being series connected with at least one of said metallic members forming one of the connections.

LEO J. WAHL.

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