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Continuation-in-part of application Ser. No. 782,214, Dec. 9, 1968, now abandoned.

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[54] **ELECTRICALLY HEATED HAIR CURLER**
3 Claims, 6 Drawing Figs.

[52] U.S. Cl..... **219/222,**
132/33, 132/36; 219/242, 219/541

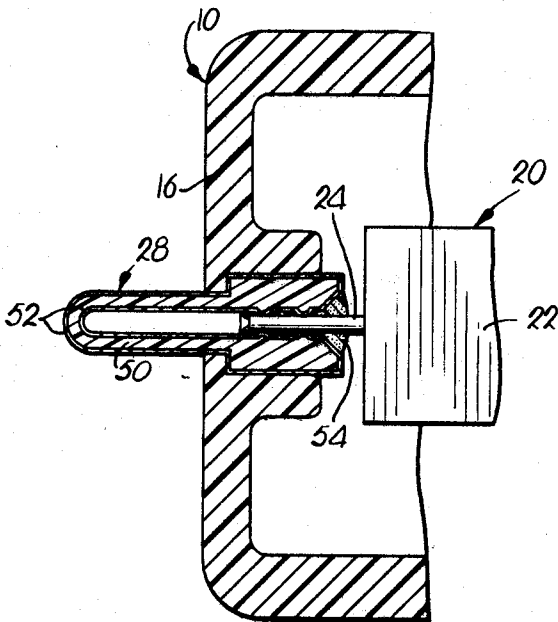
[51] Int. Cl..... **A45d 2/36,**
A45d 4/12; H05b 1/00

[50] Field of Search..... **219/222-**
—226, 242, 541; 137/33, 34, 36, 36.1, 36.2, 39

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ABSTRACT: Tubular hair curlers containing electric heating elements with capped terminals are heated on a support having conductor bars across which the curlers are laid. A series of curlers are heated simultaneously to about 170° F. in 6 to 7 minutes, the heat loss being only about 1° F. per minute while the curlers are in the hair. The caps are made to conduct electric current but are highly resistant to heat transfer. The caps are in the form of metallically coated insulators electrically connected to the heating element terminals through use of a metallized adhesive or a spring clip.



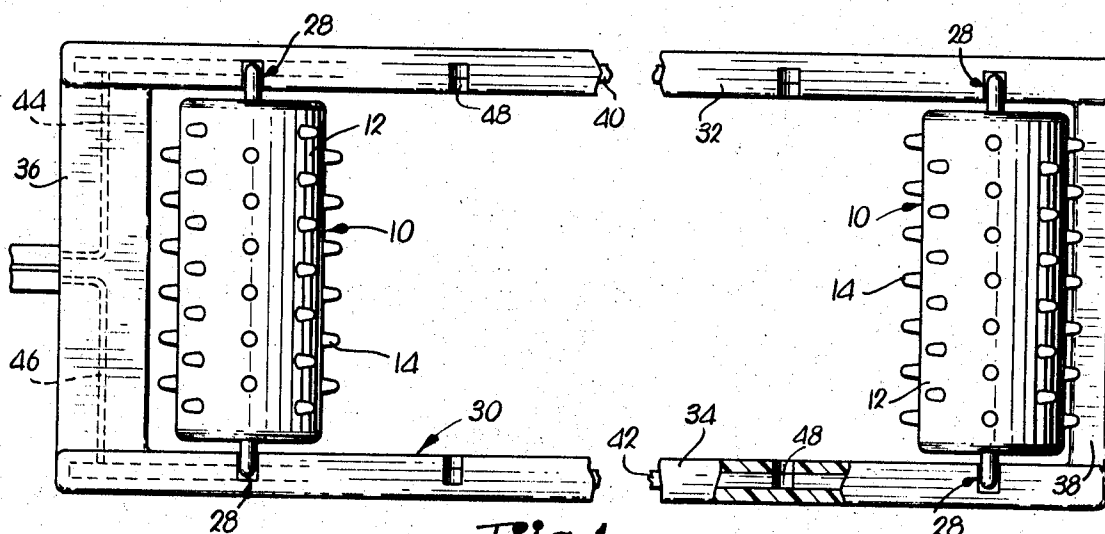


Fig. 1.

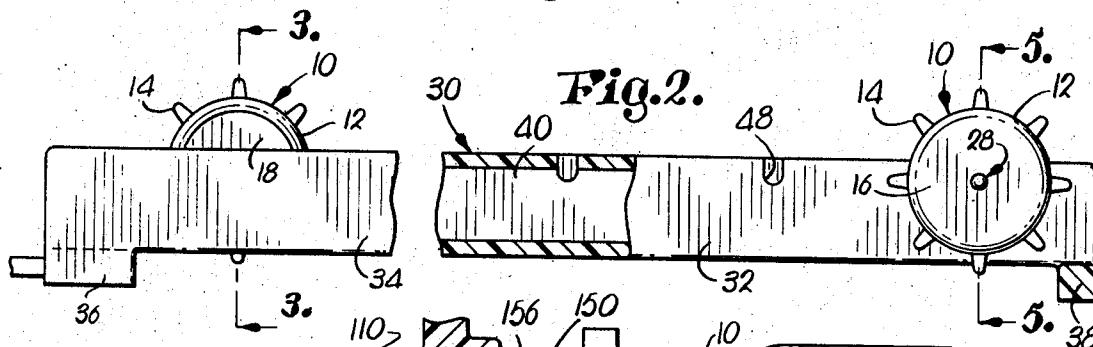


Fig. 2.

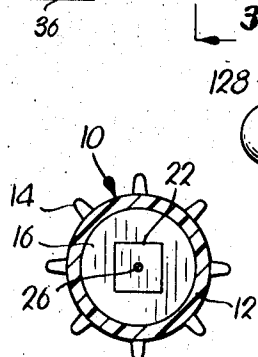


Fig. 3.

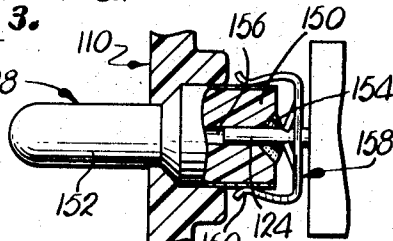


Fig. 4.

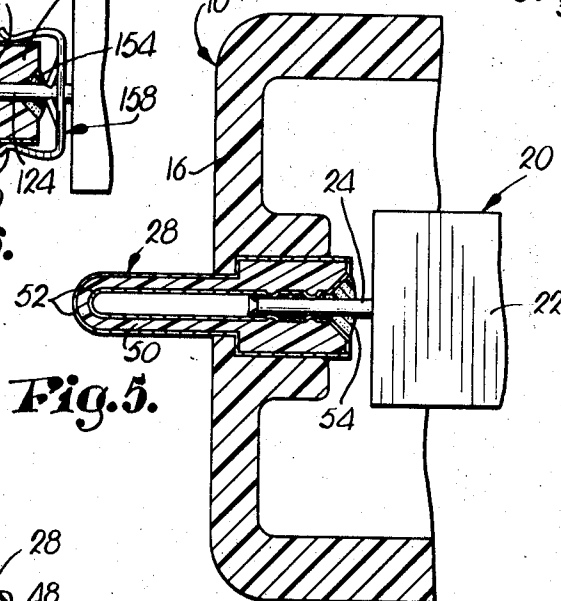


Fig. 5.

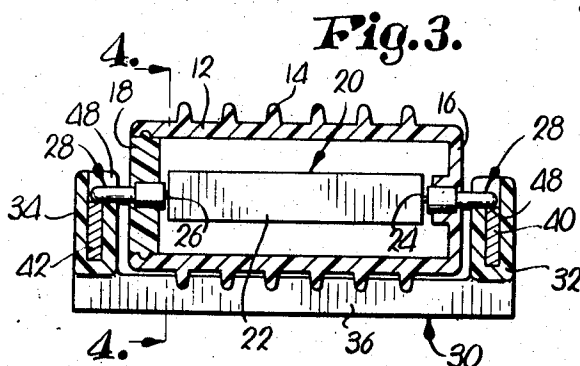


Fig. 6.

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ELECTRICALLY HEATED HAIR CURLER

This is a continuation-in-part of my now abandoned copending application Ser. No. 782,214 filed Dec. 9, 1968, entitled "System For Heating Curlers."

My present invention provides a system for heating hair curlers embodying a self-contained heating element in the form of a wire resistance coil enclosed within a ceramic body to the end that the curlers may be heated prior to use, requiring no outside source of heat energy while the curlers are in the hair. A support for a series of curlers is adapted to cause heating of a series of curlers simultaneously through use of conductor bars on the support that are engaged by capped terminals at the ends of the curlers which are in turn coupled with a resistance coil in each curler respectively.

It is an important object of my instant invention to cap the terminals in such manner as to conduct electrical current when the curlers are on the support while, at the same time, prevent burns to the head, ears and neck of the user from the caps when the heated curlers are applied to the hair and in use therein.

Another important object of the present invention is to accomplish the aforesaid results through use of caps in the form of metallically coated insulators attached to the terminals through use of a metallized adhesive.

In the drawing:

FIG. 1 is a plan view of a support for heating hair curlers made pursuant to my present invention;

FIG. 2 is a side elevational view of the support shown in FIG. 1, partially broken away and partially in section for clearness;

FIG. 3 is a cross-sectional view taken on line 3-3 of FIG. 2;

FIG. 4 is a cross-sectional view taken on line 4-4 of FIG. 3;

FIG. 5 is an enlarged, fragmentary cross-sectional view similar to a portion of FIG. 3; and

FIG. 6 is a view similar to FIG. 5 showing a slightly modified curler.

In FIGS. 1-5, hair curlers 10 each include an elongated, hollow, molded plastic, tubular body 12 adapted for curling of hair thereabout among a plurality of outwardly extending prongs 14 integral with body 12. Body 12 is closed by an end wall 16 and an end plug 18 having a snap fit into body 12 as shown in FIG. 3. An electric heating element 20 in body 12 has a wire resistance coil (not shown) enclosed within a ceramic coating 22 and provided with metallic terminals 24 and 26 supported by wall 16 and plug 18 respectively.

Each of the terminals 24 and 26 has a cap 28 thereon which includes a tubular heat insulator 50 plated internally and exteriorly with an electrical conductor 52. Terminals 24 and 26 have portions which extend into corresponding caps 28 and which are coated with an adhesive 54 containing electrically conductive material.

The heat insulators 50 may be made from any suitable substance whose thermal conductivity is relatively low such as an asbestos, but since this class of minerals usually has rather high electrical insulating characteristics it is necessary to provide the same with plating 52 as aforesaid.

However, there are many so-called plastic materials, natural or synthetic, which may be used for the heat insulators 50, it being necessary to select a type which can be shaped while soft into the form illustrated and which will harden into a durable condition. Moreover, such materials must remain rigid at the temperatures to which they will be subjected when the curlers 10 are heated as hereinafter set forth.

Representative plastic materials are rubber and the various natural and synthetic plastics, such as those made by the polymerization of organic substances, which include cellulose acetate, phenol-formaldehyde, urea-formaldehyde, certain of the acrylates and the like. Manifestly, such plastics may well contain the usual fillers, plasticizers, stabilizers, pigments, etc. Certain inorganic materials may also be used as well as those materials which are commonly referred to as resins, having starting materials that include one or more of the chemically homogenous polymers.

Copper is of course suitable for the plating 52 because of the fact that it is a good conductor of electricity and more resistant to atmospheric corrosion than certain other electrically conductive materials. On the other hand, nickel also has good resistance to corrosion and can easily be coated onto the insulators 50 as shown in FIG. 5. But many other materials may be selected for the conductor 52, as desired.

An epoxy resin may be selected for the adhesive 54 because of the advantages attained by its thermosetting properties, and when copper, nickel or other granules or particles of a like nature are mixed into the resin, an electrical path is established between terminals 24 and 26 and the plating 52.

On the other hand, if the material selected for the insulators 50 has both low thermal conductivity and high electrical conductivity, the coating 52 need not be used except as may be desired for appearance, strength and corrosive resistant purposes.

A support 30 for curlers 10 has a pair of elongated, hollow frame pieces 32 and 34, joined at their ends by crossmembers 36 and 38 which hold the frame pieces 32 and 34 slightly elevated. Frame pieces 32 and 34 contain longitudinally extending conductor bars 40 and 42 respectively which are adapted for coupling with a source of electrical energy through wires 44 and 46 extending through member 36.

Note Notches 48 in the frame pieces 32 and 34 receive the caps 28 for engagement with and support by the bars 40. It has been found that through use of a 2,000 ohm, 10 watt watt resistor in a suitable ceramic coating 22, the row of curlers 10 on support 30 will heat to about 170° F. in six to seven minutes. Coatings 22 will hold the heat while the curlers 10 are in the hair for the normal 10 minute period of time needed to complete the curling operation, the temperature drop being only about 1° F. per minute.

The caps 28, made as above described, will readily conduct the electrical current when curlers 10 are placed in the support 30 as illustrated, and when the heated curlers 10 are placed in the hair the danger of burns from the caps 28 is eliminated because of the low heat conductivity of the material 50.

In FIG. 6, curler 110 differs from curler 10 in the elimination of the need for coating 52 within bore 156 of insulator 150 and the elimination of the need for establishing an electrical path through adhesive 154. Instead, a metallic spring clip 158 has a press fit on terminal 124 and is provided with a plurality of fingers 160 which yieldably receive the inner end of cap 128 in engagement with coating 152 made of the same material as coating 52.

I claim:

1. In a hair curler:

an elongated, tubular body adapted for curling of hair thereabout and provided with end closures;

an electric heating element in said body provided with opposed terminals;

a cap on each terminal extending through a corresponding closure;

each of said caps comprising a nonmetallic tubular member constructed of low thermally and electrically conductive material and being coated internally and externally with an electrically conductive metallic coating; and said terminals extending into the interior of a respective member and being electrically connected to the metallic coating.

2. The invention of claim 1, each cap having a metallized adhesive electrically connecting the metallic coating on the cap to its terminal.

3. In a hair curler:

an elongated, tubular body adapted for curling of hair thereabout and provided with end closures;

an electric heating element in said body provided with opposed terminals;

a cap on each terminal extending through a corresponding closure;

3

each of said caps comprising a nonmetallic, tubular member having an external metallic coating and constructed of low thermally and electrically conductive material; and

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each terminal having a spring clip of electrically conductive material connecting the terminal with said coating.

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Disclaimer and Dedication

3,560,704.—*John R. Albert*, Leawood, Kansas. **ELECTRICALLY HEATED HAIR CURLER**. Patent dated Feb. 2, 1971. Disclaimer and Dedication filed Dec. 23, 1982, by the assignee, *Dazey Products Co.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

[*Official Gazette November 1, 1983.*]