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[54] **HAIR CURLING APPARATUS**
12 Claims, 7 Drawing Figs.

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132/33, 219/241, 219/242, 219/516, 219/519

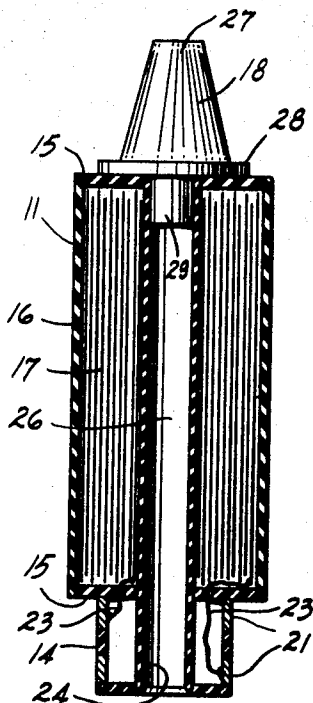
[51] Int. Cl..... **A45d 2/36,**
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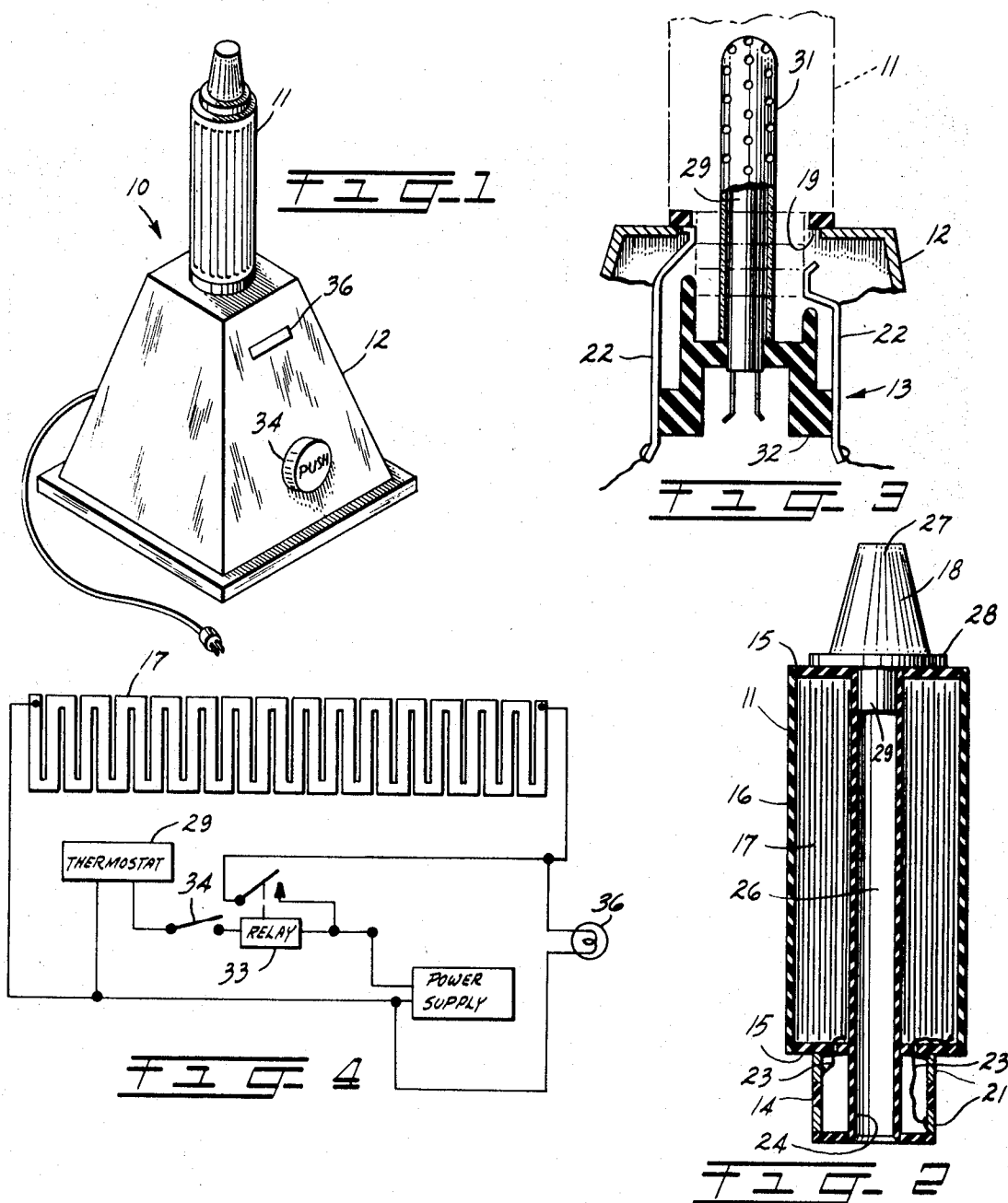
[50] Field of Search..... 132/36, 33,
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ABSTRACT: A new and improved preheated curler having a unique heating means incorporated therein. The curler includes an insulating jacket having an internal insulating sleeve extending axially therealong with the heating means encapsulated therebetween, wherein the heating means comprises the greatest mass of the curler. The curler is inserted into an energizing unit having thermostatic control means which engages the sleeve and limits the curler temperature to a predetermined value. The curler is rapidly heated to the predetermined temperature which can be a relatively high temperature and, since the heating means is contained within an insulating jacket, it may be applied to the hair before becoming warm to the touch. The curler also retains and provides heat for a relatively long period of time.





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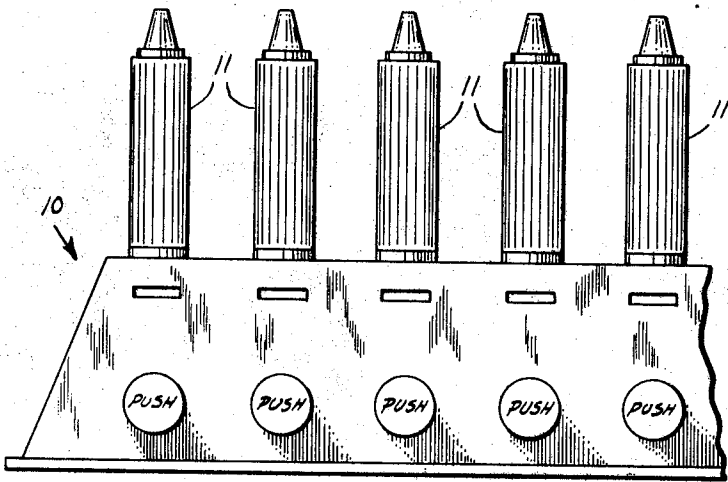


FIG. 5

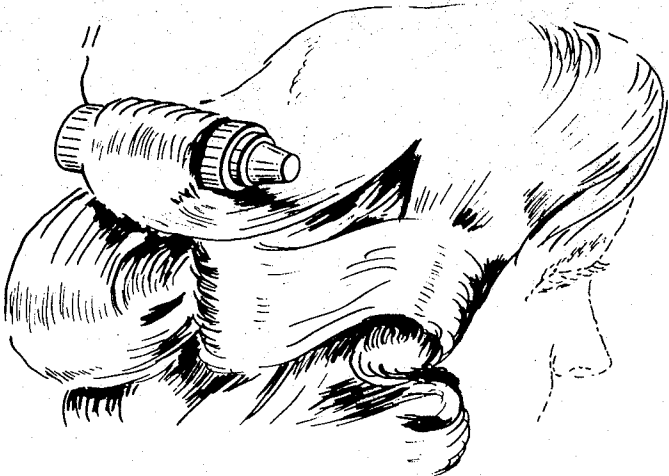


FIG. 6

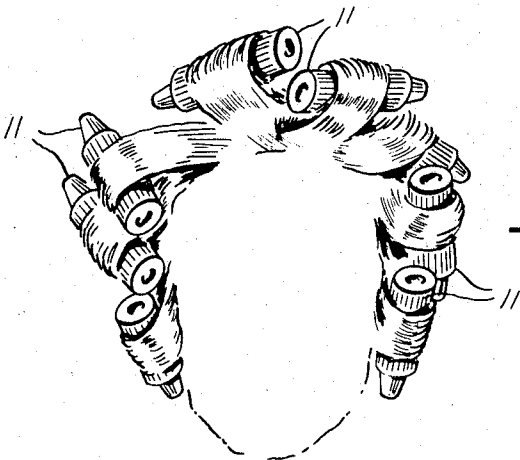


FIG. 7

HAIR CURLING APPARATUS

BACKGROUND OF THE INVENTION

The present invention involves an improved hair curling apparatus which is superior to currently available curlers. Conventional hair curling apparatus requires a longer heating period during which a wound coil is brought up to temperature and then removed and placed in the hair. At this time, the curler portion of the apparatus is quite uncomfortable to the touch and there is always the possibility of receiving burns. Furthermore, the unit tends to cool rather quickly. The heating unit for energizing presently available curlers is also relatively large and inconvenient, requiring a separate carrying case. In units which are designed for heating successive curlers, a waiting period of 5 to 6 minutes is generally required between the application of each curler.

One basic distinction between conventional heating systems for the preheated type of hair curler and the type described herein resides in the design of the heating element and its surrounding heat transfer sheath. The conventional curler generally employs a wire-wound element comprising relatively fine wires which generate the necessary heat and provide the resistance which restricts the current flow within the safe operating range required by national safety standards. Since the fine wires represent a small portion of the total mass, the wires must necessarily be raised to a high temperature in order to heat the heat retaining material, usually a ceramic substance, and to compensate for the energy loss in heat transfer. The ceramic material and other nonheat generating components in the conventional type of curler represent about 80 per cent of the total mass with the heat generating element comprising the remaining 20 per cent. The curler of the present invention substantially reverses these ratios in which the mass of the heating element can be approximately four times that of other materials. Thus, the heating element need not be raised to the same high temperature as conventional units to obtain comparable results and since the heat dissipates slowly and evenly the normally large amount of heat transfer loss is reduced.

The present invention, however, pertains to an apparatus including a curler element which, if desired, may be heated to a much higher temperature than prior art units which have a longer heating cycle and employ wire-wound elements. Since the heating element of this novel apparatus is surrounded by an insulating sleeve, the unit may be readily applied to the hair before it becomes warm to the touch. The temperature of the external curler area does not reach its peak temperature for approximately two minutes. The present invention, therefore, has the additional advantages of increased heating mass, high temperature, high current and short energizing period which permit the curler to retain heat for a relatively long period. Furthermore, a relatively small unit may be used to energize the curling element and a unique thermostat control may be included wherein a single thermostat may be used for any number of curlers.

SUMMARY OF THE INVENTION

Accordingly, the object of this invention is to provide new and improved hair curling apparatus.

With the above and other objects and advantages in view, the present invention pertains to a unique method and apparatus for heating and curling hair. The apparatus comprises an energizing unit including means for controlling the heating temperature of said unit and a curler element which is inserted therein to be energized by said unit. The curler includes a cylindrical outer jacket of an insulating material surrounding a heating element and an axial sleeve extending therealong also of an insulating material wherein such heating element comprises the largest mass of the curler, preferably about 80 per cent of such mass. Electrical contact means are connected to the heating element which can be located at the base of the curler while a winding knob is provided at the outer end thereof.

In operation, the curler is inserted into the energizing unit and rapidly brought up to a predetermined temperature. The insulating jacket surrounding the heating element prevents the immediate transfer of heat to the exterior of the curler. This permits an individual to apply the curler before it becomes warm to the touch. It also permits the heating element to be raised to a considerably higher temperature than conventional units and it permits this heat to be retained for a longer period of time. Due to the design of the heating element however, the element need not be raised to the same high temperature as commercial units to achieve equivalent results.

BRIEF DESCRIPTION OF THE DRAWINGS

The features of the present invention will be more clearly understood when viewed in conjunction with the accompanying drawings wherein:

FIG. 1 is an isometric view of the subject invention showing a curler inserted in an energizing unit;

FIG. 2 is a cross-sectional view of the curler;

FIG. 3 is an enlarged cross-sectional view of the curler base illustrating the contact arrangement;

FIG. 4 is a schematic illustration of the electrical circuit of the present invention;

FIG. 5 shows a battery of the subject curlers in another embodiment of the invention;

FIG. 6 shows a single curler which is applied and then reheated and reapplied to the hair; and

FIG. 7 shows a plurality of such curlers being applied to an individual.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, the present invention comprises a hair curling apparatus 10 including a preheated curler 11 and an energizing unit 12 having a thermostatically controlled contactor or contacting unit 13 mounted therein for supplying an electric current to raise the curler 11 to a predetermined temperature. The novel hair curler or "individual curl" dryer 10 as hereinafter disclosed requires a comparatively short heating cycle and retains the heat for a longer period than conventional curlers. This is due to the fact that the apparatus 10 is energized by an instantaneous high electric current which develops the internal temperature of the curler 11 to a much higher degree than units having a longer heating cycle and employing wire-wound elements.

The curler 11 comprises a base contacting portion 14 at one end, a main body portion 16 forming an insulating jacket for an encapsulated heating means 17, and a winding knob 18 on the other end thereof. The main body portion 16 is cylindrical in shape and includes a corrugated outer surface which as shown in FIG. 1 consists of a plurality of raised portions that facilitates the winding of the hair. The base contacting portion 14 extends outwardly from the cylindrical main body portion 16 and is of reduced diameter to engage the aperture 19 in the energizing unit 12. At least two contact rings 21 are mounted about the base contacting portion 14 at spaced intervals in order to contact the socket contacts 22 within the aperture 19 in the manner shown in phantom in FIG. 3. The two socket contacts 22 comprise resilient metal elements of differing lengths which are mounted at one end to an insulating socket base 32 of the contacting unit 13. Leads 23 connect the respective contact rings 21 to opposite ends of the heating element 17. The curler 11 also includes an insulating sleeve 24 which extends along an axial aperture 26 in the body portion 16 from the base contacting portion 14 to the end of the main body portion 16. The heating means 17 is thus encapsulated or contained by the insulating washers 15 and by the insulating jacket of the main body portion 16 on the upper, lower and outer surfaces thereof and by the insulating sleeve 24 along the axial aperture 26. The heating means 17 may be essentially a prestamped grid of NICHROME or similar high-resistant material. The grid cross-sectional thickness and pattern are calculated to provide the desired heating effect without overloading a conventional 15 amp. 120 v. AC power supply.

In a typical embodiment, the stamped grid is coated with heat-resistant material such as TEFLON which acts both as an electrical insulator and a heat transfer barrier to minimize the dissipation from the heating element 17 to the outside. The treated element 17 is then wound on a center hollow core such as the previously described insulating sleeve 24 and a 2-con-

tactor plug such as base contacting portion 14 is mounted thereto for engagement with a double contact socket in the contacting unit 13, hereinafter fully described.

The winding knob 18 includes a frustoconical gripping portion 27, an intermediate flange portion 28 which abuts against the upper washer 15 and a protruding lower portion which is mounted within the aperture 26 preferably in a force fit. The knob 18 provides a convenient means for gripping the curler 11 when it is being wound and particularly after the body portion 16 has reached its maximum temperature. In some instances, a second knob 18 may be provided for insertion into the other end of aperture 26.

The energizing or heating unit 12 is provided with a unique thermostatic control wherein a single thermostat 29 may be used for any number of curlers. The thermostat 29 is designed into the contacting unit 13 so that the thermostat 29 senses the heat from the curler 11 and controls the electric current supply to obtain the desired temperature. The thermostat 29 also prevents the operator from reheating a curler 11 a second time and elevating the temperature to an unsafe operating point. In normal operation, the thermostat 29 regulates the heating temperature of curlers 11 as they are fed successively to the energizing or heating unit 12. As shown in FIG. 3, the thermostat 29 comprises an elongated heat sensitive element which is enclosed within a perforated cover 31 and mounted at its lower end to the insulating socket base 32. The thermostat 29 extends upwardly within the aperture 26 in the curler 11 when the curler 11 is inserted into the contacting unit 13. Thus, the thermostat 29 is able to effectively sense and control the temperature of the curler being heated.

Referring to FIG. 4, the control circuit for the hair curling apparatus 10 comprises a single pole relay 33 which is operated to energize the heating element 17. The relay 33 is activated by the pushbutton switch 34 connected in series between the thermostat 29 and the relay 33 and remains operated until the circuit is broken by the thermostat 29 at a predetermined temperature or the switch 34 is released. The circuit may include a pilot light 36 which is connected in parallel with the relay 33 in order to indicate that the circuit is closed and that the element 17 is being heated. The light 36 will go off when either the pushbutton switch 34 is released or the thermostat 24 opens.

Relay 33, acting as a timing device, could also provide a means of automatically regulating the temperature of the individual curler. This could be accomplished by use of various types of electronic circuit delay controls. Thus, relay 33 would control the heating cycle of the curler by means of a time interval, with the thermostat acting as a safety cutoff for excessively high temperatures or when the pushbutton might be activated beyond the time required for heating the curler to a safe operating temperature.

The energizing unit 12 of FIG. 1 is relatively small in size and can fit into a conventional ladies' handbag when traveling. Present curlers, which employ a row of multiple preheat rods, require a separate carrying case; and the units designed for heating successive curlers have the disadvantage of requiring a waiting period of approximately 5 to 6 minutes between each curler. Since the curler 11 of the present invention requires a relatively short energizing period it is not ordinarily necessary to have more than one energizing unit 12. However, the embodiment of FIG. 7 shows that it is entirely possible within the teachings of this invention to provide a battery of such units 12 for particular conditions of use.

It is also to be noted that several curler sized having varying diameters may be provided to compensate for the differences in the thickness or length of hair to be wound on the curlers 11. In a typical case, as many as five different diameters may

be required ranging from three-fourths inches to 1 inches in outside diameter. The present invention may be designed to accommodate different size curlers 11 by simply reducing the cross-sectional thickness of the heating means or grid 17. Reduction in the thickness of material increases the electrical resistance and consequently decreases the maximum temperature approximately in proportion to the diameter. This is desirable since the smaller curls require less heat. However, it is still important to have the small diameter curlers 11 cool slowly, even though they may cool proportionately faster than the larger diameter units. Since in the new type curler, the effective heating material comprises about 80 percent of the total material, a more direct control of the required temperature curve can be accomplished than with a conventional unit.

Reducing the thickness of the heating element 17 contributes to reducing the diameter of the unit 11 because of its "layer" built structure where the diameter will be reduced according to the number of layers times the reduction in the thickness of the heating element 17. The grid plate type of element will also retain its practically 100 percent radiating area regardless of the diameter of the curler 11.

The actual use of the curlers 11 is illustrated in FIGS. 6 and 7 with FIG. 6 showing a single curler 11 which is reheated after each curling operation. The single curler mode of operation may be performed advantageously with the present invention since the curler 11 may be heated or rather be energized for heating in from 2 to 5 seconds depending upon the size of the curler unit and the heat required for various masses of hair wound on the curler 11. FIG. 7 shows a number of curlers being employed at the same time and, since the curlers heat rapidly and yet permit handling, a plurality of such curlers may be readily applied to the hair. It is to be noted that the exterior surface of the curlers may be corrugated to facilitate the hair winding operation.

What has been described above are merely illustrative examples of the application of the principles of the invention. Numerous other arrangement may be readily devised by those skilled in the art which will embody the principles of the invention and fall within the spirit and scope thereof.

I claim:

1. An apparatus for curling hair comprising:

a curler including an insulating outer jacket, an insulating sleeve extending within the jacket, a heating element between said jacket and sleeve including a grid of high resistance material wound around said sleeve to form a plurality of layers which essentially fills the space between said sleeve and outer jacket and which comprises about 80 percent of the mass of the curler, and a first contactor secured to one end of said curler and connected to said heating element, and

an energizing unit including a second contactor which receives said first contactor and temperature control means having a portion in heat exchange relationship to said curler so as to sense the temperature of said curler for controlling the temperature to which said heating element is heated by said energizing unit when said contactors are in contact with each other.

2. An apparatus for curling hair in accordance with claim 1 further including:

an insulating washer mounted between the outer jacket and the sleeve at each end of the curler to encapsulate the heating element and minimize the rate of heat loss, and a winding knob having a gripping portion at one end and an outwardly projecting portion at the other end mounted fixedly within the sleeve for securing said knob to the curler.

3. An apparatus for curling hair in accordance with claim 2 wherein:

the insulating outer jacket comprises a substantially cylindrical jacket having a corrugated outer surface to facilitate the hair winding operation, and the first contactor has a diameter which is less than the outer jacket and includes at least two contact rings mounted thereabout for engagement by the second contactor.

4. An apparatus in accordance with claim 1 wherein:

The energizing unit includes an aperture, the second contactor being mounted therewithin, and said second contactor includes a socket portion, contact means extending outwardly therefrom to engage the first contactor, and wherein said temperature control means extends upwardly from said contact means to engage the insulating sleeve of the curler.

5. An apparatus for curling hair in accordance with claim 4 wherein the first contactor includes a pair of spaced contact elements connected to the heating element, and

the contact means of the second contactor mounted within the energizing unit includes a pair of formed metal contact elements each designed to engage a respective one of the contact elements in the first contactor and the temperature control means includes a thermostat having a perforated cover mounted thereover.

6. An apparatus for curling hair in accordance with claim 1 wherein:

the energizing unit includes switch means for actuating said unit, relay means activated by the switch means to remain operative during a heating interval and said temperature control means includes a thermostat mounted to the second contactor and having means for deenergizing the relay when a predetermined curler temperature is reached.

7. An apparatus for curling hair comprising:

a curler having an insulating outer jacket, an insulating sleeve extending axially within the jacket, a heating element mounted between the jacket and the sleeve, means for sealing the heating element at the ends of the jacket to contain said element between the jacket and sleeve and thereby minimize heat transfer, a winding knob having a projecting portion which extends into one end of the sleeve to retain the knob in position and a contactor secured to the curler at the other end of the sleeve and having first contact means connected to the heating element, and

an energizing unit having an aperture therein and a contacting unit mounted within the aperture, said contacting unit comprising second contact means for engaging the first contact means on the curler contactor, temperature control means extending outwardly from the aperture on the energizing unit insertable in and engaging the sleeve to control the temperature to which the curler is heated, and means for supplying power to the heating element from the energizing unit through the second and first contact means.

8. An apparatus for curling hair in accordance with claim 7

wherein:

the insulating outer jacket of the curler is substantially cylindrical in shape and includes a plurality of raised portions along the outer surface thereof to facilitate the hair winding operation and,

the temperature control means comprises a thermostat which inserts in and engages the sleeve when said first and second contacting means are in contact with each other, said thermostat being coupled to the means for supplying power to the heating element to limit the power when a predetermined temperature is reached, the temperature of the outer curler surface permitting handling due to the insulating outer jacket and said curler retaining the heat for a period of time to facilitate the hair.

9. An apparatus for curling hair in accordance with claim 8 wherein the heating means comprises a mass approximately four times greater than the rest of the curler.

10. A preheated hair curler comprising:

an insulating outer jacket,

an insulating sleeve extending axially within the jacket which, along with said jacket, retains heat generated by the curler for a long period of time,

a current carrying, high-resistant, metallic heating element mounted between said jacket and sleeve which essentially fills the space therebetween and which comprises about 80 percent of the mass of the curler to thereby provide an element which requires a short energizing period, provides heat for a long period, and which, along with the insulating outer jacket, allows time for the curler to be applied to the hair before the curler becomes warm to the touch, and

means attached to said curler and connected to said heating element for conducting current thereto, and exposed for connection to an external source of electrical current.

11. A preheated hair curler comprising:

an insulating outer jacket,

an insulating sleeve extending axially within the jacket, a heating element between said jacket and sleeve including a grid of high resistance material wound around said sleeve to form a plurality of layers which essentially fills the space between said sleeve and outer jacket and which comprises a mass approximately four times greater than the rest of the curler, and

means attached to said curler and connected to said heating element for conducting current thereto, and exposed for connection to an external source of electrical current.

12. A preheated hair curler according to claim 11 wherein said grid includes an outer layer of insulating material.

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