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Johansen

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[54] **HAIR CURLER WITH PLASTIC INTEGRAL RING**

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[52] **U.S. Cl.** ..... **132/33 R**

[51] **Int. Cl.** **A45d 2/12**

[58] **Field of Search** ..... 132/33 R, 39, 40; 219/222; 229/5.6; 220/67, 73

[56] **References Cited**

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[57] **ABSTRACT**

A hair-curler having an open cylindrical cavity at one end and having an outer plastic casing formed around an inner metal heat-accumulating body. The open cavity allows the curler to be mounted onto a pin-formed heating element. The outer plastic casing is bent inwardly over and firmly grasping the end edge of the heat-accumulating body in order to effect a tight bond between the two surfaces and in order to insulate the metal surface of the inner heat-accumulating body. Apparatus for forming the outer casing over the inner heat-accumulating body.

1 Claim, 8 Drawing Figures

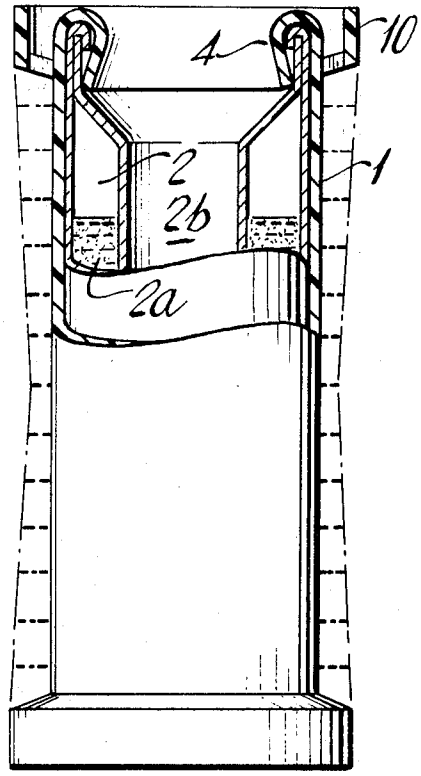


Fig.1.

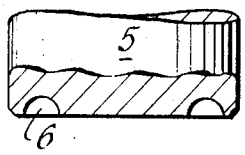


Fig.2.

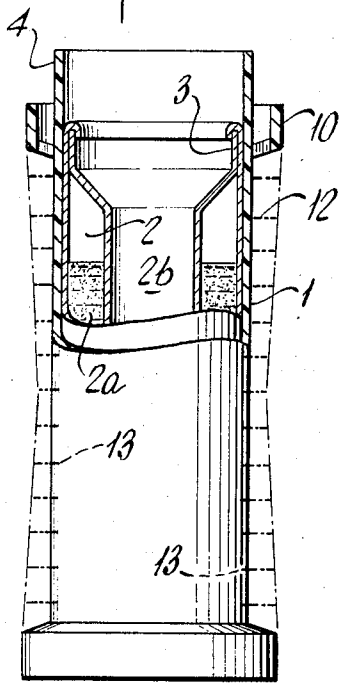


Fig.3.

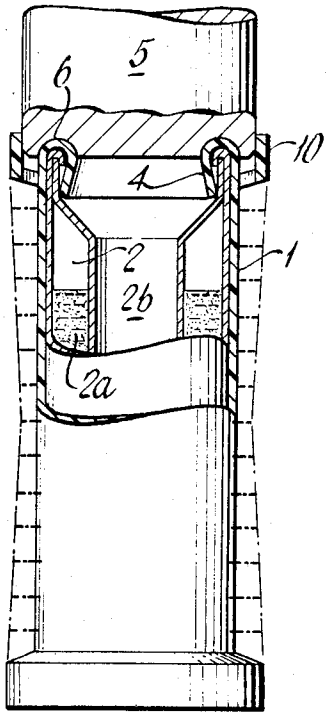


Fig.4

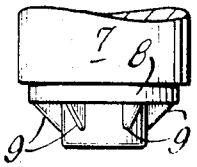


Fig.5.

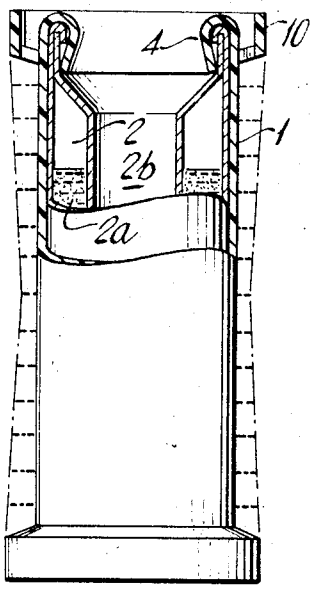


Fig.6.

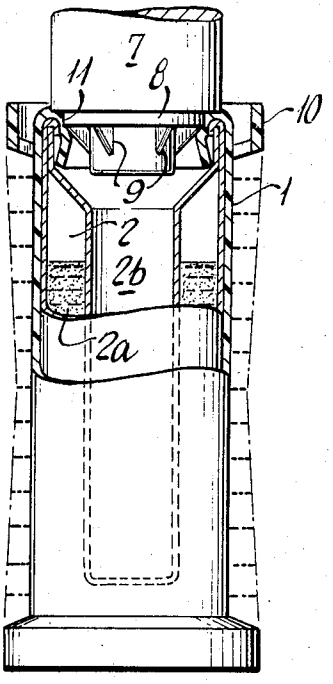


Fig.7.

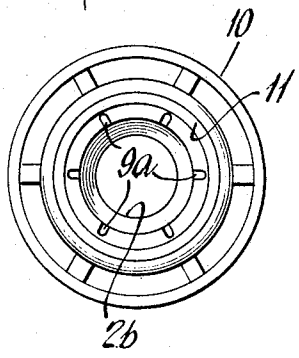
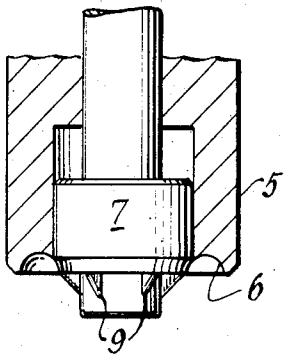


Fig.8.



HAIR CURLER WITH PLASTIC INTEGRAL RING

This invention is concerned with an improved hair curler being adapted for mounting onto a pin-formed heater element. The curler is comprised of an outer plastic casing and an inner metal heat-accumulating body. At one end of the curler is an open cylindrical cavity for receiving a pin-formed heating element. The invention is further concerned with the method of attaching the outer casing to the inner heat-accumulating body and to the apparatus used in such method.

In the past, hair curlers adapted for heating from the inside of the curler via a pin-formed heating element have been so constructed as to expose a portion of the metal inner heat-accumulating body so that the danger of touching and possible burning of one's fingers is present. Moreover, such curlers on occasion, particularly after a period of use have exhibited separation between the inner and outer casings.

It is accordingly an object of the present invention to provide an improved curler which substantially eliminates these objectionable features and at the same time, affords a simple and economical method for making such curlers.

In accordance with the invention an essential feature of the curler is that the end section of the plastic outer casing at the open end of the cavity is bent inwardly over and firmly grasping the end edge of the inner heat accumulating body. When this is accomplished the end section is formed along the inner wall of the cavity to cover the previously exposed metal surface and acts as a heat insulating ring. Thus, the plastic casing of the curler is attached to the heat-accumulating body without the risk of the casing working loose from the inner body and a convenient and effective heat-insulating ring is formed along the inner wall of the cavity.

Since deformed plastic materials have a certain demonstratable memory, in accordance with the invention, the bent edge section is provided with ring-formed or rib-formed embossments which are form-stabilized. Such embossment tends to counter the tendency of the plastic material to assume its original shape.

The invention will be more clearly understood by reference to the drawings in which:

FIG. 1 is a side elevational view showing a die or male forming member of the apparatus used in the method for making curlers in accordance with the invention;

FIG. 2 is a side elevational view showing the outer plastic casing containing the inner heat-accumulating body, ready for attachment by means of the forming member shown in FIG. 1;

FIG. 3 is a side elevational view showing the curler and die after the end edge of the plastic casing is bent;

FIG. 4 is a side elevational view showing a die for making form-stabilizing embossments on the bent end edge of the plastic casing;

FIG. 5 is a side elevational view showing the outer plastic casing containing the inner heat-accumulating body, ready for treatment by means of the die shown in FIG. 4;

FIG. 6 is a side elevational view showing the die of FIG. 4 engaging the hair curler shown in FIG. 5 to produce embossments;

FIG. 7 is a plan view showing the completed hair curler viewed from its open end; and

FIG. 8 is a cross-sectional view of another embodiment showing the two-stage die.

According to the invention, the apparatus for attaching the outer plastic casing to the inner heat-accumulating body of the hair curler includes a press tool with a die having a circular bead-producing groove in its bottom. The heat-accumulating body having an outer plastic casing mounted thereon is placed beneath the die with its open end facing upward. As the die moves downward the end edge section of the outer plastic casing engages the die so that by a rolling and bending movement in the bead-producing groove, which is of circular arc cross-section, it is caused to lay along the inner side of the axially extending end edge of the inner body.

The apparatus may have a die which is provided near its bottom with ring-formed or rib-formed projections or grooves adapted for producing plastic-stabilizing embossments in the bent edge section of the plastic casing. By using this type of die the plastic is treated so that its tendency to assume its original form is eliminated.

The present invention contemplates using each of the above discussed dies sequentially or providing for one die to be telescoped by conventional means within the other.

In order to prevent any compression of the plastic casing in the axial direction during the press or forming operation, the apparatus may be provided with a clamping tool for use on the outside of the curler. The inner wall of the clamping tool is provided with depressions which are adapted for receiving pin-formed or web-formed projections located on the outer surface of the curler, depending on the particular design of the outer surface of the curler.

The plastic casing will usually be manufactured separately and pulled onto the heat-accumulating body directly before the parts are united at the end edge. However, it is possible to mold the plastic casing on the heat-accumulating body. According to the preferred embodiment of the invention, the plastic casing used is of such length that in its mounted position it extends beyond the open end of the curler, and by the cold deformation the projecting extension is rolled over the end edge of the heat-accumulating body.

Referring now to the drawings, the hair curler consists of an outer plastic casing **1** mounted on the outer side of a heat-accumulating body **2** comprised of a double-walled cylindrical container. Between the container walls is a heat-accumulating material such as, for example, erythrite designated in FIG. **2** as **2***a*. The inside walls of the container define an inner cavity **2***b* for receiving a pin-formed heating element (not shown). At its open end the heat-accumulating body **2** has an upright axial end edge **3** at the joint between the outer and inner container walls. As shown in FIG. **2** the plastic outer casing **1** extends above the inner body with an end edge section **4** which is bent inwardly by rolling and caused to rest around the end edge **3** when die **5**, shown in FIG. **1**, is moved downwardly over the end edge section **4**. Die **5** is provided in its bottom with a circular bead-producing groove **6** having a circular arc cross-section located so that during the downward movement of the die, groove **6** guides the end edge section **4** to assume the form as shown in FIG. **3**, where die **5** is in the down stroke or bottom position. At the completion of the down stroke of the die the end edge section **4** extends annularly along the inner wall of the heat-accumulating body to act as a heat- insulating pro-

tective integral ring. The bent end edge section **4** not only serves to protect the user against inadvertent contact with the metal inner wall surface of the heat-accumulating body, but it also serves to retain the plastic casing **1** to the heat-accumulating body **2** and prevents the casing from separating.

In FIG. **4**, die **7** is shown having a bottom shoulder **8** and a plurality of rib-like projections **9**.

FIG. **5** shows the outer plastic casing **2** after die **5** has engaged and bent the end edge section **4**. FIG. **6** shows die **7** in the down position, shoulder **8** engaging end edge section **4** to produce an annular deformation or embossment **11** shown in FIG. **7**. By using die **7** both rib-formed deformations **9a** and groove-formed deformations **11** may be produced by contact of projections **9** and shoulder **8** with end edge section **4**.

The hair curlers of the present invention are provided with flanged sections **10** at each end which facilitate easy and safe handling and reduce the tendency of the wound hair to slide off the curler at the ends. During the pressing operation with dies **5** and **7**, flange **10** is supported by means of a simple clamping tool positioned along the outer surface of **10**. However, improved clamping and support is obtained when the clamping tool has an inner wall with depressions **13** for receiving projections **12** located on the outer surface of the curler.

The press tool may be so designed that the heat-accumulating body **2** with the plastic casing **1** mounted thereon is at first brought into position beneath the die **5** and brought into position beneath the die **7** in the subsequent operation as indicated in the drawings. However, the die **7** may also be designed as to be axially displaceable in the die **5** and be brought to operate as soon as the die **5** has been passed into the position indicated in FIG. **8**.

What is claimed is:

1. A hair curler adapted for convenient and safe handling and for more efficient retention of wound hair on the outer surface of the curler comprising a substantially tubular outer casing having side walls, a closed end and an opposite open end, and an inner heat-accumulating container disposed within said outer casing and having an axis extending parallel to the longitudinal axis of said tubular casing, said inner container comprising an inner wall and an outer wall forming a hollow cylindrical heat conductive sleeve having a central cavity adapted to permit the insertion of a heating element in heat conductive contact, said outer wall having a terminal portion bent over said inner wall to form end edge sections, said sleeve containing a heat-absorbing material, said outer casing side walls having end edge sections bent inwardly over the end edge sections of the inner container to form an integral annular ring along the inner wall of the heat-accumulating body thereby joining the outer casing to the inner container, wherein said bent end sections are comprised of form-stabilizing embossments said curler further comprising opposite radial end flanges and disposed between said end flanges a central section having projections on its outer surface, said end flanges having a diameter greater than the diameter within said central section.

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