United States Patent

[11] **3,566,887**

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[73] Assignee **General Electric Company**

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[54] **HAIR CURLER**
8 Claims, 3 Drawing Figs.

[52] **U.S. Cl.** **132/39**
[51] **Int. Cl.** **A45d 2/14**
[50] **Field of Search** 132/39, 40, 41, 33, 38; D86/102

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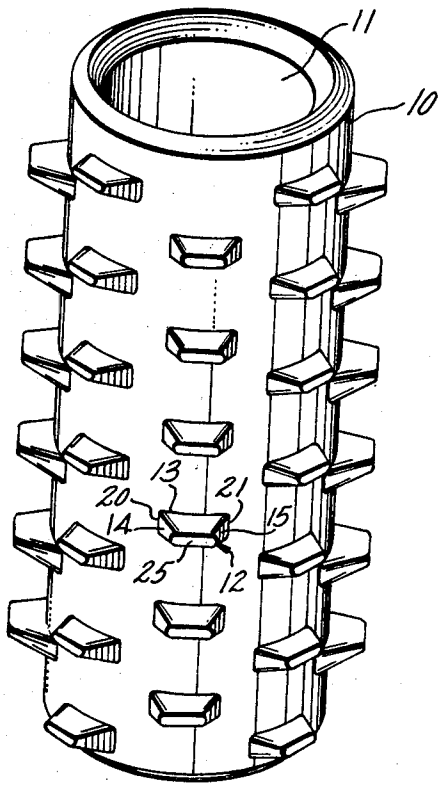
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ABSTRACT: The disclosure herein concerns a hair curler that prevents tangling of the hair. The curler consists of a cylindrical body with an array of outwardly projecting elements arranged in at least six longitudinally extending rows around the body. The sidewalls of the projections, as viewed in a plane normal to the longitudinal axis of the curler body, converged to form an included angle between 25 and 50 degrees which is substantially bisected by radial lines.



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Fig. 1.

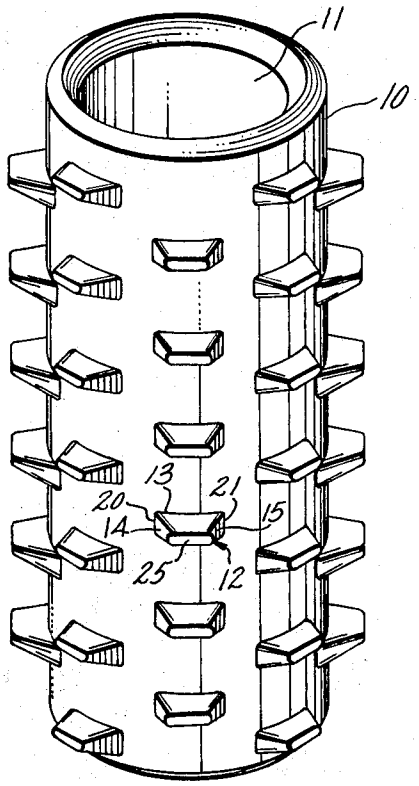


Fig. 2.

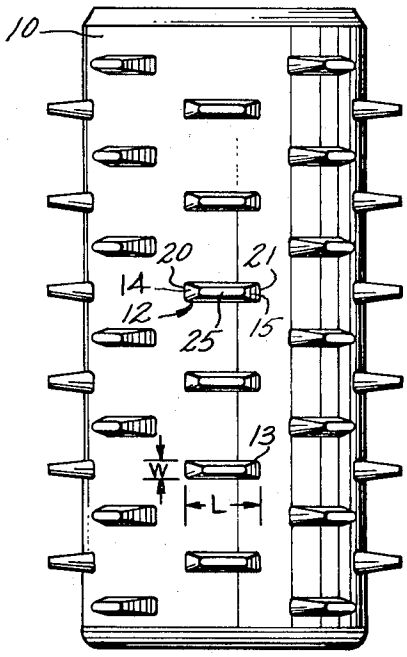
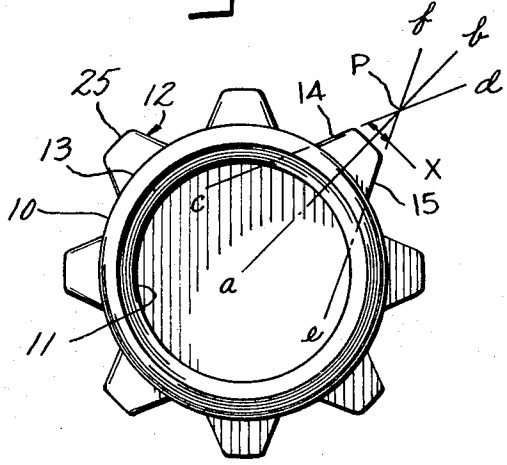


Fig. 3.



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HAIR CURLER

BACKGROUND OF THE INVENTION

This invention relates to hair curlers or rollers and more particularly to the type of hair curlers that are used in conjunction with electrically heated hair curling devices.

Electrically heated hair curling devices generally consist of a support plate heated by electrical resistance to a temperature in the range of 125° to around 200° F, which is provided with a plurality of upstanding heat conductive rods or posts. Hair curlers used with these devices are cylindrically shaped and have an internal cavity so that the curler may be placed on the posts and heated to an elevated temperature. Other means of heating the curlers may be used, but this is perhaps the most common. To curl the hair, the user simply energizes the hair curler device, as by a switch, and allows the hair curlers, which have been placed on the heating posts, to be heated for a short period of time. The heated curlers are then removed from the posts one by one, and a lock of hair is wound circumferentially around each hair curler. The curler is retained in place in the hair usually by means of a hair clip or bobby pin. The heated hair curler gives off heat while the hair is wound around it, thus softening the cortex or hard outside layer of the hair, and after a short period of time the hair will be set or curled, whereupon the curlers are removed from the hair. These hair curlers are provided with outwardly projecting elements around the cylindrical body of the curler for the purpose of serving two functions primarily.

One function of the outwardly projecting elements is to grip the hair when the lock of hair is wound circumferentially around the curler. The hair fibers are retained between the outwardly projecting elements somewhat in the fashion as the teeth of a comb. By so retaining the hair fibers, the projections aid in securely holding the hair curler in place within the curl of hair. The projecting elements of the curler are usually arranged in rows that extend longitudinally along the outer cylindrical surface of the curler body and are spaced around the curler. The rows are spaced apart so that when a lock of hair is rolled up on a curler, a hair clip can be easily placed on the curler lengthwise in the area between the spaced rows. It is desirable to have quite a few spaced rows of projecting elements so that a sufficient number of areas are provided around the circumference of the curler between the rows for receiving hair clips. By having a sufficient number of these areas, the curler is retained in place in the user's hair as close to the scalp as possible, thereby deriving maximum benefit from the curler in setting the lock of hair. Moreover, by having quite a few of these hair clip receiving areas, the hair curler is more easy to use and convenient for the user to apply during the hair curling operation.

The second function served by the outwardly projecting elements of the curler relates to when the curler is heated. Upon heating the curler, the body of the curler becomes quite hot and to enable the user to handle the heated curlers while rolling up a lock of hair, it is desirable that the fingers not touch the hot body of the curler. By providing outwardly projecting elements in a sufficient number around the cylindrical outer surface of the curler, the fingers of the user are kept out of contact with the hot body of the curler, thus affording comfortable handling.

One of the difficulties with curlers having projecting elements, heretofore, is that during the removal of the curler from the lock of hair by taking out the hair clip and unrolling the curler from the lock, some care was required to guard against tangling or weaving the hair around the projecting elements. The projecting elements used heretofore on this type of curler were cone-shaped with the base of the cone joined integrally to the cylindrical body. The width of the base of the cone-shaped projecting element was quite small in relationship to the height of the projections, and they were oriented around the cylindrical surface in such a manner that they tended to act as claws when the curler was being unrolled from the lock of hair. Careless removal of the curler caused the clawlike projections to retain some of the hair fibers so that the hair fibers became tangled around the projections as the unrolling proceeded.

Hair curlers are made in various sizes. The type curler used with electrically heated hair curling devices are commonly available in the small, medium, and large size. The large size curler is usually between two and three inches long and has a body diameter, excluding the projecting elements, of approximately an inch.

By my invention, I have provided a hair curler with projecting elements that serves the two above-mentioned functional purposes and also prevents tangling of the hair around the elements when the curler is used.

SUMMARY OF THE INVENTION

In accordance with my invention, there is provided a hair curler with a cylindrical body having an array of outwardly projecting elements. The curler, when viewed in a plane normal to the longitudinal axis of the body, has the sidewalls of each projecting element converging upon each other in a direction away from the body of the curler. The included angle formed by the converging sidewalls is from 25 to 50°, and the angle is substantially bisected by a radial line through the longitudinal axis of the curler. The projecting elements should be arranged in evenly spaced, longitudinally extending rows disposed around the circumference of the cylindrical body. At least six rows with from three to five outwardly projecting elements per lineal inch in each row should be provided. With this number of spaced rows, there are a sufficient number of areas provided around the circumference of the curler between the rows for receiving hair clips to retain the curler properly in place in the user's hair as well as provide a curler that is easy and efficient to use. With from three to five outwardly projecting elements per lineal inch in each row, excessive finger contact with the heated body of the curler is prevented.

It is an object of this invention to provide a hair curler with projecting elements that will not tangle the hair.

It is another object of this invention to provide a hair curler with an array of outwardly projecting elements for use in connection with electrically heated hair curler devices, which curler is efficient, easy to use, and prevents tangling of the hair.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective view of my hair curler;
FIG. 2 is a side elevation view of my hair curler; and
FIG. 3 is a top view of my hair curler.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings in detail, FIG. 1 illustrates a hair curler used in connection with a common variety of electrically heated hair curler devices. These curlers are normally heated preparatory to the hair setting operating operation by placing them on heat conductive posts of the curler device. The curler consists of a cylindrical body **10** that has an interior cavity **11** opening from at least one end of the curler for receiving the heated post of the hair setter device. The utilization of this invention does not depend upon the interior structural arrangement of the curler, but works quite well no matter what the interior arrangement is. The curler may incorporate, if desired, heat conductive and retentive material to enhance the heat transfer and heat storage qualities of the curler. The cylindrical outer surface of the curler body **10** has an array of outwardly projecting elements **12** which function to provide a means of keeping the fingertips away from the hot cylindrical body **10** and also provide a means for gripping the hair to retain the curler in the hair in the rolled-up condition. For the projecting elements **12** to accomplish these two functional purposes, they should meet several criteria.

The projecting elements should have as little mass as possible to minimize the amount of heat transferred to them from the hot curler body **10**, but yet fulfill the other desirable characteristics of such a curler. There should also be as few projecting elements as possible to minimize the total mass of the projecting elements, but yet have enough elements properly distributed around the curler to prevent the user's fingers from contacting the hot curler body. It has been found that if the number of projecting elements on curlers made in accordance with this invention is from three to five per lineal inch, the user can comfortably handle the heated curlers under normal hair curling or setting operations. It is also desirable to have the projecting elements arranged in spaced rows so that a hair clip may be placed lengthwise on the curler between the rows without obstruction from the projecting elements. By having the elements arranged in spaced longitudinally aligned rows and having at least six rows and preferably eight, there are sufficient areas around the circumference of the curler to receive the hair clip so that the curler may be used to its maximum benefit with a minimum of effort on the part of the user.

It has also been found that if the projecting elements in successive rows are staggered with respect to each other, as shown in the drawings, the lock of hair wound upon the curler is more readily retained in its proper place on the curler by preventing lateral shifting of the hair. With particular reference to FIG. **2**, it should be noted that the base **13** of each projecting element is generally rectangular in shape where it joins the curler body **10**. The width W of the base is preferable less than half the length L of the projecting element base. The reason for the base of the projecting elements to have this generally rectangular shape and be oriented as shown in FIGS. **1** and **2** with the width of the base parallel to the longitudinal axis of the curler is that more curler body surface is provided for the hair to come in contact with when it is wound circumferentially upon the curler during the hair setting operation. This means that more hair will be in contact with the hot curler body per square inch of curler body, thus increasing the efficiency of the curler. Moreover, by providing such a projecting element base with a very narrow width, the hair fibers when wound around the curler are not forced to take a torturous zigzag path as they pass from one projecting element to the other. Otherwise, the hair when set would be kinky.

With reference to FIG. **3**, the profile of the projecting elements **12**, as viewed in a plane normal to the longitudinal axis of the curler body **10**, can be readily seen. The projecting elements **12** are integrally joined to the curler body **10** at their base **13**. Curlers of this type are normally manufactured by molding the body and projecting elements simultaneously in one operation. They may be molded from a variety of synthetic plastic compositions, such as nylon, polyethylene, polypropylene, or other suitable moldable material. If the curler is to be heated for use, or subjected to special hair treating solutions, the material from which it is made should, of course, be compatible with the environmental conditions involved. I have found that nylon produces quite satisfactory results when curlers molded therefrom are used with heated hair curling devices. The projecting elements **12** are substantially centered on radial lines, which lines pass through the longitudinal central axis of the curler. Such a radial line is designated in FIG. **3** as line *a—b* with point *a* being on the longitudinal central axis of the curler. Sidewalls **14** and **15** of the projecting elements **12** extend respectively from both width base end lines **20** and **21** and converge upon each other in a direction away from the body **10** of the curler. Line *c—d* represents the sidewall **14**, and line *e—f* represents sidewall **15**. The sidewalls **14** and **15**, if extended, would intersect each other, as shown by the intersection of lines *c—d* and *e—f* at point P. The included angle formed by intersecting lines *c—d* and *e—f* is designated X in FIG. **3** and is the angle referred to herein as the included angle formed by the converging sidewalls of the projecting elements. The intersection of lines *c—d* and *e—f* at point P is on radial line *a—b*; therefore radial line *a—b* bisects the included angle X. I have found that if the included angle formed by the converging sidewalls of the projecting elements is substantially bisected by a radial line and if that included angle is 25 to 50°, hair will not tangle around the projecting elements when the curler is used. If the included angle is less than 25°, the hair will have a tendency to tangle around the projecting elements. If the included angle is more than 50°, a sufficient number of spaced rows of projecting elements cannot be provided around a curler body of usable size and the overall performance characteristics of the curler is not satisfactory.

The preferred hair curler to accomplish all of the desired features mentioned above should have eight longitudinally extending rows of projecting elements, which rows are disposed around the cylindrical surface of the curler body **10** and spaced from each other a distance sufficient to easily accommodate a hair clip therebetween. The projecting elements in successive longitudinally extending rows should be staggered with respect to each other. Each row should have from three to five projecting elements per lineal inch, with the base of each projecting element where it joins the curler body being generally rectangular in shape and the width of the base less than half its length. When viewed in a plane normal to the longitudinal axis of the curler body (FIG. **3**), the included angle formed by the converging sidewalls of the projecting elements should be between 40 and 48°.

The height of the projecting elements from their base may vary. I have found, however, in considering such factors as comfort in handling the curlers by the user, space consideration in storing the curlers and ease of manufacturing the curlers, it is desirable to truncate the projecting elements so that the top **25** of each projecting element is substantially flat. If desired, all of the sides of the projecting elements may converge toward the top **25**, as shown in the drawings.

The foregoing is a description of the preferred embodiment of the invention, and variations may be made to the structure of the device without departing from the spirit of the invention, as defined in the appended claims.

I claim:

1. A hair curler comprising a cylindrical body, an array of outwardly projecting elements arranged in at least six longitudinally extending rows around the cylindrical body, each of said projecting elements having a generally rectangular shaped base with the width of the base parallel to the longitudinal axis of the curler, and sidewalls, as viewed in a plane normal to the **85** axis of said body, converging toward each other in a direction away from the curler body, with the included angle formed by said converging sidewalls being between 25 and 50° and substantially bisected by radial lines.

2. The hair curler of claim **1** wherein the elements are arranged in eight spaced rows.

3. The hair curler of claim **2** wherein the included angle is between 40 and 48°.

4. The hair curler of claim **1** wherein the elements in successive rows are staggered with respect to each other and there are three to five elements per lineal inch in each row.

5. A The hair curler of claim **1** wherein the width of the base of each projecting element is less than half the length of said base.

6. A hair curler comprising:

a plastic cylindrical body, an array of elements projecting outwardly from said body and arranged in eight longitudinally extending rows spaced around the body with three to five elements per lineal inch in each row,

said elements in successive rows being staggered with respect to each other,

each of said projecting elements having a generally rectangular-shaped base with the width of the base parallel to the longitudinal axis of the curler, and sidewalls, as viewed in a plane normal to the longitudinal axis of said body, converging upon each other in a direction away from said body, with the included angle formed by said converging sidewalls being from 40 to 48° substantially bisected by radial lines.

7. The hair curler of claim 6 wherein the elements are truncated to provide a substantially flat top and the width of the base of each element is less than half the length of said base.

8. The hair curler of claim 1 wherein the elements are truncated to provide a substantially flat top.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,566,887 Dated March 2, 1971

Inventor(s) Thomas F. Nelson

It is certified that error appears in the above-identified patent and that said Letters Patent are hereby corrected as shown below:

Column 4, line 46, "85" should read -- longitudinal --

Signed and sealed this 6th day of July 1971.

(SEAL)
Attest:

EDWARD M.FLETCHER,JR.
Attesting Officer

WILLIAM E. SCHUYLI
Commissioner of P