

Nov. 22, 1960

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2,960,989

HAIR CURLING DEVICE

Filed March 28, 1957

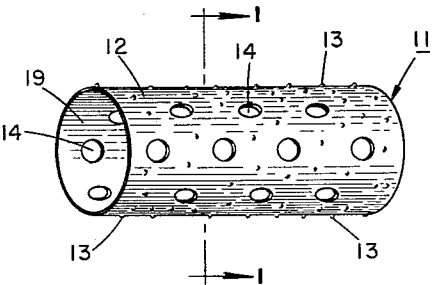


FIG. 1.

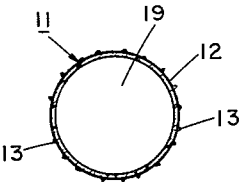


FIG. 2.

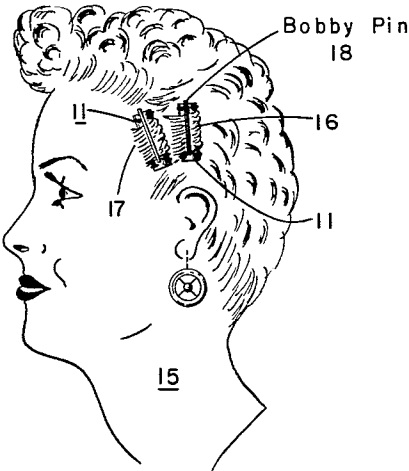


FIG. 3.

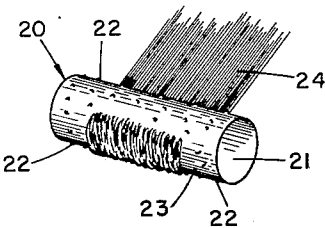


FIG. 4.

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2,960,989

HAIR CURLING DEVICE

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Filed Mar. 28, 1957, Ser. No. 649,227

10 Claims. (Cl. 132—39)

The present invention is directed to a device useful for curling hair. More particularly, the invention is directed to a hair curling device. In its more specific aspects, the invention is concerned with a device which is useful in waving or setting hair. The invention is also directed to a method for forming the hair curling device.

The present invention may be briefly described as a hair curling device in which an open ended tubular member is provided. The open ended tubular member forms an outer cylindrical surface and the outer cylindrical surface is provided with irregularly shaped randomly spaced apart protrusions or particles covering at least a sufficient amount of the surface such that moistened hair wound on the surface is retained thereon.

The present invention is also concerned with a method for producing a hair curling device in which a tubular member is formed and on the tubular member there is deposited a layer of adhesive on the outer surface thereof. Thereafter there is deposited on the surface in random a sufficient amount of irregularly shaped particles such that a sufficient amount of the surface is covered to retain a curl of moistened hair thereon.

In the device of the present invention, it is contemplated that the tubular member may be provided with spaced apart perforations. The perforations may be of any size, shape or configuration but preferably are circular perforations. The area of the perforations may comprise from about 5% to about 30% of the area of the surface. From about 10% to about 20% of the area of the surface may be comprised of the perforations.

The tubular member may be constructed of any suitable material. For example, the tubular member may be suitably constructed of paper; paper of the kraft type may be suitable. Other materials such as plastics, metals, non-deformable rubber (either synthetic or natural) may be employed. The tubular member of the present invention is preferably of a hollow cylindrical form and may have a length from about $\frac{3}{4}$ of an inch to about 3 inches with a diameter ranging from about $\frac{1}{2}$ inch to about 2 inches. It is necessary that the tubular member be of sufficient strength to maintain substantially its cylindrical shape on drying of moistened hair thereon. It is known that moistened hair shrinks when it dries and exerts a considerable force on the tubular member which may tend to cause it to lose its circular form if constructed of materials of insufficient strength.

A particular feature of the device of the present invention is the provision of randomly spaced apart particles or protrusions covering a sufficient amount of the surface of the tubular member in order that moistened hair wound as a curl is retained thereon. In the practice of the present invention, the outer cylindrical surface of the tubular member has deposited thereon irregularly shaped particles which are adhesively attached thereto. For example, the particles may have a size in the range from about 10 to about 60 mesh (U.S. sieve series). A suitable mesh size may range from about 16 to about 40 mesh.

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The particles may be of a narrow range according to size or may be of a wide range of sizes. For example, the particles may suitably all lie in a range from about 10 to 16 or 20 mesh or in another portion of the broad range given above, such as from 16 to 20 mesh, 20 to 30 mesh, or 30 to 40 mesh, or the particles may have a range of sizes from 10 to 60 mesh. If a wide range of particle sizes is used, it will usually be desirable to limit the amount of particles of the largest diameter in the range of 10 to 16 or 20 mesh to not more than about 10% by weight of the total particles. Good results have been obtained using particles having a particle size distribution as follows: 10 to 16 mesh—3%; 16 to 20 mesh—41%; 20 to 30 mesh—45%; 30 to 40 mesh—9%; 40 to 60 mesh—2%. Particularly good results are obtained if the largest particles have diameters at least twice the diameter of the smallest particles. This condition is met if the particle size range is at least from 10 to 20 mesh, 16 to 30 mesh, 20 to 40 mesh, etc.

The particles may be attached to the outer cylindrical surface of the tubular member by providing a layer of a suitable adhesive thereon. The particles are randomly spaced apart on the cylindrical surface of the tubular member such that preferably from about 5 to about 50 percent of the surface of the tubular member is covered with particles. It may be desirable in some instances to have substantially complete coverage up to about 90% to about 95% of the surface of the tubular member covered by or with the particles or protrusions. It is contemplated in the practice of the present invention that the particles will be adhered to or imbedded in the outer cylindrical surface to the extent only that they are retained on the surface without being sufficiently imbedded therein such that the irregularly shaped particles are not effective in retaining moistened hair on the tubular member. It is contemplated that the irregularly shaped particles will be provided on the surface and imbedded in the surface only to an extent to cause adherence thereon. The particles of the size mentioned before protrude from the surface of the tubular member about 0.01 to about 0.08 inch. Particles or protrusions with irregularly shaped configurations and having sharp corners and randomly distributed give desirable results.

Where the tubular member is formed to provide openings or perforations as has been described, the unperforated surface may be suitably covered with particles formed to provide protrusions covering from about 5% to about 95% of the unperforated surface.

The irregularly shaped particles may be comprised of a variety of many materials. It is desirable that the irregularly shaped particles have a hardness on the Mohr scale in the range from about 2 to about 7. As examples of the materials finding use in the present invention as irregularly shaped particles may be mentioned, by way of illustration and not by way of limitation, quartz, calcite, finely divided gravel such as bird gravel, finely divided silica, dolomite, feldspar, garnet, alumina, zirconia, marble, flint, agate, grit, pumice, plastics, metals, ceramics, and the like.

In forming the device of the present invention a tubular member is formed such as, for example, by rolling a cylinder of paper of the desired shape and strength, following which a layer of an adhesive material is deposited on the surface of the tubular member. Thereafter, there is deposited randomly on the surface a sufficient amount of irregularly shaped particles of the type mentioned before such that a sufficient amount of the surface is covered by the irregularly shaped particles. For example, the irregularly shaped particles may be deposited in and on the layer of adhesive by sprinkling the irregularly shaped particles on a rotating tubular member

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such that the irregularly shaped particles are deposited randomly thereon.

The type of adhesive which is useful in the present invention may suitably be a liquid or plastic material which, when dry or in a solid state, is not materially affected by moisture. A rubber base paint, other paints, shellacs, lacquers, water resistant glues, and the like may be used. Solutions of polymer such as synthetic rubbers or synthetic resins may be used. Ordinarily it is desirable to employ an adhesive material which will not be affected deleteriously at temperatures up to about 150° F. In other words, in employing the device of the present invention in waving hair, it is necessary that the adhesive not soften at temperatures of at least 150° F.

The present invention will be further illustrated by reference to the drawing in which

Fig. 1 is a perspective view of one form of the device;

Fig. 2 is a cross-sectional view of the device of Fig. 1 taken along the lines 1—1;

Fig. 3 shows the application of the device of the present invention in waving hair on a subject; and

Fig. 4 shows a modified device in accordance with the present invention wherein a curl of moistened hair is being started on the device of the present invention.

Referring now to the drawings in which identical numerals will be employed to designate identical parts, numeral 11 designates a tubular member forming an outer cylindrical surface 12. The outer cylindrical surface 12 has randomly spaced apart thereon protrusions or particles 13 covering a sufficient amount of the surface. For example, the particles or protrusions may cover preferably from about 5% to about 50% of the surface 12. These particles are effective in retaining moistened hair on the device of the present invention without abrading or causing the hair to break. The device of the present invention as shown in Fig. 1 is provided with a plurality of perforations or holes 14 which may be arranged in a regular pattern on the tubular member 11. The holes or perforations 14 may comprise from about 5% to about 30% of the surface 12.

In employing the device as shown in Figs. 1 and 2, the subject 15 whose hair is to be rolled has the moistened hair 16 rolled on the tubular member 11 until the tubular member 11 has been rolled down to and adjacent the scalp 17 of the subject 15. Thereafter, the curl formed on the tubular member 11 is held in place by inserting a bobby pin 18 or other suitable clamping device such as a pin curl clip, a wave clamp and the like through the opening 19 of the tubular member and over the hair rolled on the surface 12 to hold the tubular member in fixed position relative to the hair until the moistened hair has been sufficiently dried to retain the shape of the curl; the bobby pin 18 may be placed on the side of the tubular member 11 away from the scalp 17 on curls which are not rolled entirely to the scalp.

Fig. 4 shows a modified device in accordance with the present invention in which a tubular member 20 having a central opening 21 is provided with randomly spaced apart particles 22 which may be arranged in a layer of adhesive 23 on the surface of the tubular member 20. In employing the device of Fig. 4, the moistened strand of hair 24 is started on the tubular member 20 as shown and then the tubular member 20 is rolled until the scalp of the subject 15 has been reached as may be desired. Thereafter, a bobby pin such as 18 shown in Fig. 3 is inserted over the hair curl in contact with the tubular member 20 through the opening 21 to hold the curl formed in place relative to the tubular member 20.

The device of the present invention is quite advantageous and useful in that it makes possible more rapid drying of moistened hair than has been possible heretofore. In the practice of the present invention using the improved device, a strand or tress of moistened hair is wound on the curl form down to the scalp of the subject as may be desired. Thereafter, as has been described,

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the incipient curl is fastened in place with a bobby pin and then the subject is placed under the usual dryer for drying of the hair. Heretofore, it has been necessary to place thin strips of paper called end papers over the ends of the hair to hold the hair on the curl form while the curl is being wrapped thereon. In the practice of the present invention, end papers are not required since the device of the present invention with the irregularly shaped randomly spaced particles on the outer surface thereof grasps and holds the moistened hair ends firmly and permits the formation of tight curls without loss of friction between the curl form and the hair. Omission of the end papers which normally absorb a substantial quantity of water or lotion reduces substantially the amount of moisture which must be removed during the hair drying process.

It is not completely understood why the device of the present invention is so effective in retaining the moistened hair thereon without using end papers. It is believed, however, that the randomly distributed irregularly shaped protrusions or particles are especially effective in holding moistened hair. Also the range of particle sizes contributes in some unexplainable fashion in retaining the hair in a moistened condition on the tubular member to allow effective curling thereof. A typical sieve analysis of bird gravel found effective follows:

Sieve analysis (U.S. sieve series)

	Percent
10-16 mesh -----	2.9
16-20 mesh -----	41.6
20-30 mesh -----	45.6
30-40 mesh -----	8.7
40-60 mesh -----	1.3

In the practice of the present invention, the drying process is accelerated by providing the perforations or holes in the tubular member which allows air to circulate freely from the center of the cylinder through the hair. Another advantage inuring to the present invention is that the useful life of the tubular members with the irregularly shaped particles on the outer surface thereof is substantially greater than the life of other devices available on the market. The conventional devices are manufactured from perforated metal, screen wire, coils of wire over which is placed nylon mesh or other suitable materials to give a cylindrical form. The prior art devices are subject to deformation during use since the cylindrical shape is often lost where the device is constructed of light weight material. If the device is constructed of sufficiently heavy material such as metal, the prior art devices so constructed are uncomfortable to the subject whose hair is being waved.

The device of the present invention has been used successfully over an extended period of time without deformation of the tubular member. Furthermore, the device of the present invention where constructed of water-resistant paper coated with a small amount of grit of approximately 16 to 40 mesh imbedded in a water-proof adhesive applied to the exterior surface of the curl form of the present invention functioned quite satisfactorily. These devices were made up in sizes ranging from ¼ inch to about 2 inches in diameter and in length ranging from about 1 to 3 inches. A large number of the devices of the present invention has been used commercially over an extended period of time and has demonstrated characteristics superior to the prior art devices.

It is contemplated that the device embodying the tubular member with the coating of randomly spaced apart irregularly shaped particles distributed thereon may be constructed of different colors and of different lengths and diameters as has been set out. The fact of the matter is this tubular member may be of several sizes. For example, a suitable device of the present invention may have a length of about 3 inches and a diameter of about ½ to ¾ inch whereas another device in accordance with

the present invention may have a length of $1\frac{1}{2}$ inches and a diameter of from $\frac{1}{2}$ to about 2 inches. Another device in accordance with the present invention may have a length of about 1 inch with a diameter of about $\frac{1}{2}$ to about $\frac{3}{4}$ inch.

As stated before, the tubular member embodied in the device of the present invention must be constructed of substantially non-deformable material which has sufficient strength to resist the force caused by shrinkage of moistened hair during the drying process. Furthermore, it is essential in the present invention that the randomly spaced apart irregularly shaped particles be sharp cornered such that the moistened hair is retained thereon. However, the particles should not be of such fineness that the hair strands will be abraded and/or broken, such as by splitting. While the tubular member is preferably substantially non-absorbent, it is contemplated that under some conditions the tubular member may have some absorbency for moisture.

The tubular member, the layer of adhesive, and the irregularly shaped particles should be unaffected by moisture and substantially unaffected by moderate heating such as temperatures from about 120° to 150° F. used in a hair waving operation.

The nature and objects of the present invention having been fully described and illustrated, what I wish to claim as new and useful and secure by Letters Patent is:

1. A hair curling device which comprises an open ended perforated substantially non-deformable tubular member forming an outer cylindrical surface, said tubular member being of sufficient strength to maintain substantially its cylindrical shape on drying of moistened hair thereon, a layer of adhesive on said surface, and irregularly shaped randomly spaced apart hard, sharp-cornered particles having sizes in the range from about 10 to about 60 mesh (U.S. sieve series) in which the largest particles have diameters at least twice the diameters of the smallest particles imbedded in said layer and protruding therefrom covering a sufficient amount of said surface in the range from about 5% to about 95% such that moistened hair wound on said surface is retained thereon.

2. A hair curling device in accordance with claim 1 in which the tubular member is provided with perforations, the area of the perforations comprising from about 5% to about 30% of the area of said surface.

3. A hair curling device in accordance with claim 1 in which the particles have a size within the range from about 16 to about 40 mesh (U.S. sieve series).

4. A hair curling device in accordance with claim 1 in which the particles are composed of finely divided silica.

5. A hair curling device in accordance with claim 1 in which the particles have a hardness on the mho scale in the range from about 2.0 to about 7.0.

6. A device in accordance with claim 1 in which the tubular member is formed of kraft paper.

7. A hair curling device which comprises an open ended substantially non-deformable tubular member forming an outer cylindrical surface, said tubular member being of sufficient strength to maintain substantially its cylindrical shape on drying of moistened hair thereon, a layer of adhesive on said surface, said layer having embedded therein and protruding therefrom irregularly shaped randomly spaced apart hard, sharp-cornered particles having sizes in the range from about 10 to about 60 mesh (U.S. sieve series) covering a sufficient amount of said surface in the range from about 5% to about 95%, such that moistened hair wound on said surface is retained thereon.

8. A device in accordance with claim 7 in which the tubular member is provided with spaced apart perforations.

9. A device in accordance with claim 7 in which the tubular member is formed of substantially water resistant material.

10. A device in accordance with claim 7 in which the tubular member, the layer of adhesive, and the hard, sharp-cornered particles are substantially unaffected by moisture and temperatures up to about 150° F.

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