This invention relates to hair curlers or hair end waving devices of the kind adapted to be applied to the hair and left on the hair a sufficient length of time to cause a curl or wave to become formed and set without the application of heat.

It is an object of the invention to provide a hair end waver which is useful over substantially its entire length. The protruding end or handle which is so evident on hair curlers of the prior art is useless for the actual curling of the hair and causes great annoyance to the user. In accordance with the present invention, the handle is eliminated.

It is a further object of the invention to provide a hollow tubular shank having a series of transverse slots therein to permit the free circulation of air through the waver. The provision of transverse slots rather than circular openings in the sheet metal from which the tubular shank is produced avoids the formation of a seam or burr and results in the production of a smooth shank.

It is a further feature that a clamping member adapted to cooperate with the perforated hollow shank is provided with an elongated slot to facilitate the circulation of air.

It is a further object of the invention to so arrange the hair clamping members with respect to the frame that the frame has capacity for substantially unlimited swinging movement relative to the clamping members. The clamping members, themselves, are desirably arranged so that they may be swung apart as much as 180°.

The user is thereby enabled to distribute the strands of hair evenly along the shank before the winding of the curl. The clamping members are not urged together by spring pressure and hence it is not necessary for the user when arranging the hair upon the shank to hold the clamping members open against the force of a spring.

In accordance with a preferred embodiment of the invention it is a feature that provision is made of a receding pivot at the end of the curling portion of the shank. The chance of hair being caught or becoming entangled in the pivot is substantially reduced by this arrangement.

A further object of the invention is to provide an improved hair end waver wherein the curling members are perfectly smooth and are devoid of projections and catches on all portions thereof, so that the hair can be slipped off instantly without unrolling and without otherwise disturbing the formed curl or wave.

A further object of the invention is to provide a waver having a rectangle U-shaped frame which combines light weight and rigidity, which is small in its projecting dimension, which possesses great resiliency across its diametrically opposed portions, and which has at the apex of the U-shaped portion a half round convex boss conforming in size to the end opening of the tubular shank and which is adapted to snap into such opening and to be held securely therein when the frame is closed over the shank. It is a feature that the frame which is made of thin stock is rolled concave to give it rigidity, but that it is highly resilient and spreads apart readily when closed over the wound hair. The bulging of the sides of the frame results in a shortening of the frame and thereby eliminates any possibility of the frame opening while the waver is being worn.

Another object of the invention is to provide a waver which will lie flat against the head without any protruding ends or other projecting parts which might cause discomfort to the wearer when sleeping.

A still further object of the invention is to provide a waver having a frame adapted to swing on either side of the clamping members or completely around them, thereby facilitating the opening and closing of the waver in any desired position.

Other objects of the invention relate to the production of a waver which is inexpensive to manufacture, light in weight, simple, sturdy and serviceable in construction, and adapted to be quickly and easily applied and removed.

Other objects and advantages will hereinafter appear.

In the drawings forming part of this specification:

Figure 1 is a plan view of a hair waver embodying features of the invention;

Figure 2 is a side elevation of the curler of Figure 1 with the hair clamping tongue and the frame disposed at substantially equal but opposite acute angles to the shank;

Figure 3 is a view similar to Figure 2 but partly broken away, illustrating the curler with the clamping tongue and the frame brought into contiguous relation with the shank;

Figure 4 is a sectional view taken on the line 4—4 of Figure 3 looking in the direction of the arrows;

Figure 5 is a fragmentary view of a piece of
sheet metal from which a shank is adapted to be rolled;

Figure 6 is a plan view of another form of curler embodying the invention;

Figure 7 is a view in side elevation disclosing the curler of Figure 6;

Figure 8 is a fragmentary view of a piece of sheet metal which is adapted to be rolled to form the shank disclosed in Figures 6 and 7.

Figure 9 is a plan view of a further form of curler embodying features of the invention;

Figure 10 is a side elevation of the curler of Figure 9 with the parts fanned out;

Figure 11 is a sectional view taken on the line 11—11 of Figure 9, looking in the direction of the arrows; and

Figure 12 is a fragmentary sectional view through the apex of the frame.

Figure 13 illustrates a shank 1 which is composed of a sheet 2 of aluminum or other suitable material having transverse slots 3 formed in staggered relation throughout the length thereof. The slots permit air to circulate into and through the hollow shank and thus facilitate the drying of the hair which is wound upon the shank. The slotted form of the perforations and the staggered disposition thereof are both important since these features result in the production of a smoothly rounded shank free from burns or projections. If the sheet metal strip illustrated in Figure 5 were provided with aligned circular holes instead of the transverse slots and the strip were put in a die and pressed into cylindrical shape, it would be found to be burred. The shank is provided at one end with a pair of perforated pivot ears 4 which are pressed into parallel relation and which, while of large area, do not protrude laterally beyond the bounds of the tubular portion of the shank. The ears are impaled upon a pivot pin 5.

A clamping tongue 6 forms the are of a cylinder in cross section and is adapted to conform to the shank 1. The tongue 6 is provided with pivot ears 7 of substantial area, which ears are also mounted to swing upon the pivot pin 5. The ears 7 snugly embrace the ears 4 and have extensive engagement therewith. The tongue 6 forms a longitudinal slot 8 formed in it so as to facilitate access of air to the hair and to the interior of the shank 1 through the slots 3.

A frame 9 is also pivotally mounted upon pin 5 and is adapted to be swung relative to the shank 1 and the tongue 6.

The frame 9 is formed of a thin strip of sheet metal which is concave in cross section to give it rigidity while retaining a high degree of resilience. The frame forms a loop, its sides extending in spaced relation to the hair winding portion and merging into a U shape at one end. As clearly illustrated in Figure 1 the end portion of the frame is provided with a boss 10 which is adapted to fit into the end of the hollow shank and to retain the shank and the frame in fixed relation. When the hair is wound on the shank and tongue it is built up to a diameter such that it bulges the sides of the frame and thus produces a shortening of the frame. This shortening of the frame is a feature that assists in securing the secure interlocking of the frame boss 10 with the end of the hollow shank.

The mode of pivot construction illustrated and described has several advantages. The comparatively large area of the formed ears on the shank and the clamping tongue causes these ears to constitute a substantial joint insuring against premature wear and assuring perfect alignment so that objectionable lateral movement of the members 1 and 6 with relation to one another is prevented. The maintenance of proper alignment insured by the engagement of an edge of the clamping tongue with the shank in such a manner that a shearing action will result.

The receding apertured ears of the frame 9 form a frictional contact with the clamping member 6 and cause the clamping member 6 to tend to swing with the frame upon opening of the frame and thus automatically to expose the shank 1 for reception of the hair. A further purpose of this construction is to have the pivot and pivot pin recede from the winding portion of the wave so that the liability of hair becoming entangled or caught by the joint or pivot pin is avoided. Other advantages of this type of pivot construction are that it tends to reduce the manufacturing cost, allows separation of the two curling members to any desired degree and permits exposure of the curling member throughout substantially the full length thereof, increasing the ratio of the winding length of the curling member to the length of the hair to be curled, Once formed, may be removed without the necessity of unwinding it or disturbing it in any way. In this form of the
invention the shank 1b and the clamping tongue 6b are substantial duplicates of one another, each being in substantial semi-cylindrical rods, as seen best in Figure 11. Both elements are pivoted, together with the frame 9b, upon a pivot pin 5b. The shank 1b and the clamping tongue 6b are of the same length and both are adapted to coast with a depression 11 which is formed at the end of the frame remote from the pivot.

The embodiment of Figures 9 to 12 is also characterized by the fact that there are no catches or projections on the ends of the curling members so that the hair can be slipped off the curler instantly without danger of catching or entangling the hair.

This form of curler is adapted to be used on very fine locks of hair, the hair clamping members being of small dimensions. In the event that the hair when wound does not form a lock of sufficient diameter to bulge the sides of the frame, the frame is nevertheless adapted to be locked in place safely and securely. The frame is provided with a rounded boss, said shank having an open end for receiving said boss, and said side members being adapted, when pressed toward one another, to produce a relative elongation of the frame for releasing the boss from said shank.

2. In a hair end waver, in combination, a frame, a bearing member secured at one end thereof, a shank pivotally mounted on the bearing member and a clamping tongue cooperative with the shank and also pivotally mounted on the bearing member, said shank and tongue being terminated closely adjacent the bearing member and being adapted to clamp the hair and to serve as a winding core for the hair throughout substantially their entire lengths, said frame being resilient and comprising side members adapted to be spread or bulged by the wound hair, whereby the end of the frame is drawn into firm interlocking engagement with the end of the shank, said shank and tongue being each of uniform cross-section throughout their lengths, the cross-section of each being substantially semi-cylindrical so that the two, when placed into alignment with each other will have a substantially circular cross-section.

3. In a hair end waver, in combination, a frame, a bearing member secured at one end thereof, a shank pivotally mounted on the bearing member and a clamping tongue cooperative with the shank and also pivotally mounted on the bearing member, said shank and tongue being terminated closely adjacent the bearing member and being adapted to clamp the hair and to serve as a winding core for the hair throughout substantially their entire lengths, said frame being resilient and comprising side members adapted to be spread or bulged by the wound hair, whereby the end of the frame is drawn into firm interlocking engagement with the end of the shank, said end of the frame being provided with a rounded boss, said shank having an open end for receiving said boss, and said side members being adapted, when pressed toward one another, to produce a relative elongation of the frame for releasing the boss from said shank.

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