May 7, 1940. A. W. WOODFORD 2,199,453

CURL FORMING DEVICE

Filed Oct. 5, 1939

Fig. 1.

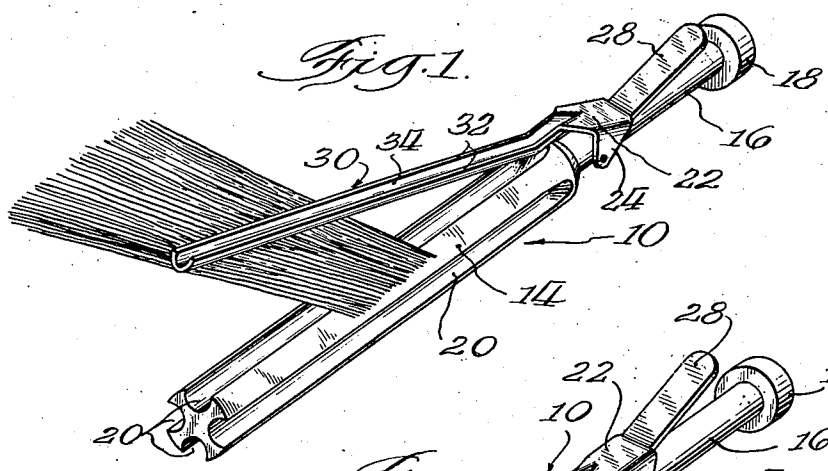



Fig. 2.

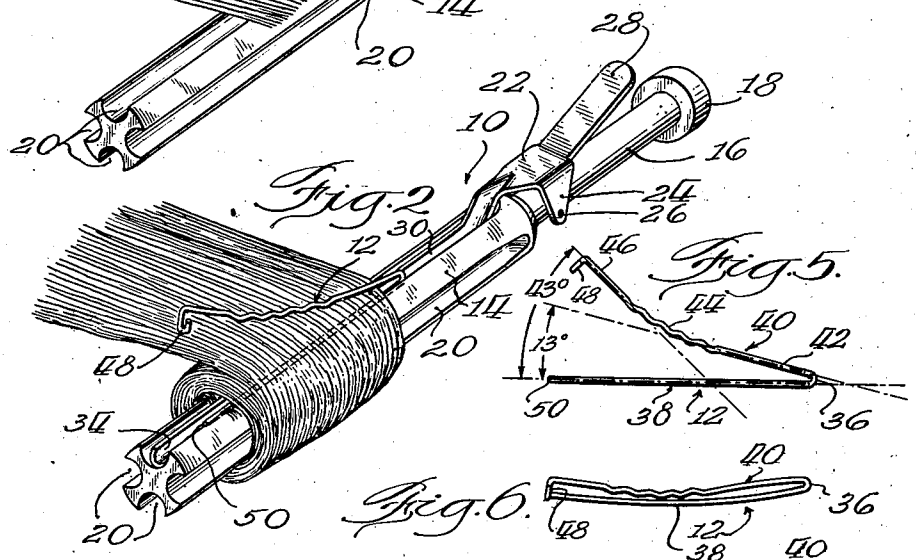



Fig. 5.




Fig. 6.




Fig. 7.

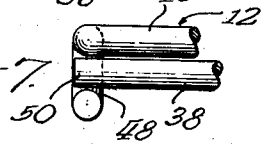



Fig. 3.

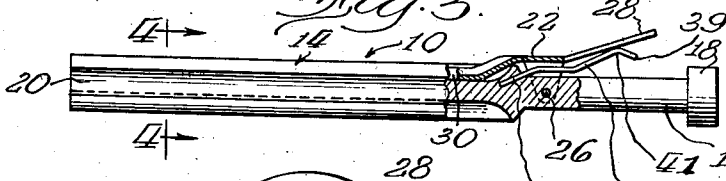



Fig. 8.

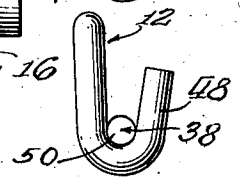
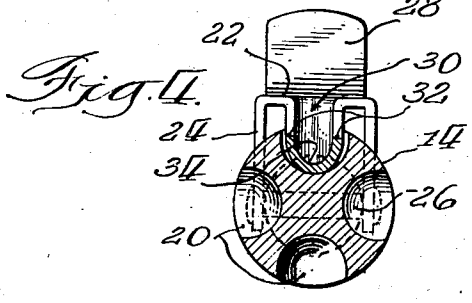



Fig. 4.




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# UNITED STATES PATENT OFFICE

2,199,453

## CURL FORMING DEVICE

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Application October 5, 1939, Serial No. 298,157

2 Claims. (Cl. 132—33)

This invention contemplates and provides an improved device for forming hair curls and is of the type wherein several strands of hair are rolled upon a mandrel and then held in place by a hair pin while the mandrel is withdrawn and used to form more similar curls.

It is an object of my invention to provide an improved hair curler which can be manufactured at low cost and which may be used quickly and easily to form curls of the above-described type.

It is an additional object to provide such a curler the use of which requires no especial training or dexterity.

A further object is to provide a novel hair pin for use with such a mandrel, which cannot accidentally become disengaged from the hair and which is free from projecting points which might become entangled in the hair or which might cause injury to the person.

Other objects and advantages will become apparent from the description and drawing illustrating a preferred embodiment of my invention and in which:

Fig. 1 is a perspective view of my hair curler shown in opened position to receive a lock of hair.

Fig. 2 is a perspective view similar to Fig. 1, but showing the curler after the lock of hair has been rolled upon the mandrel to form a curl. This view also shows my hairpin in the position it assumes when engaging the curl.

Fig. 3 is a front elevation of the curler shown in Figs. 1 and 2 with a portion thereof broken away to show details of its construction.

Fig. 4 is a sectional view which may be considered as taken in the direction of the arrows along the line 4—4 of Fig. 3.

Fig. 5 is a side elevation of my improved hairpin particularly adapted for use with the curler shown in Figs. 1 to 4.

Fig. 6 is a view similar to Fig. 5, but showing the hairpin as it appears when closed.

Fig. 7 is a detailed plan view of the latching ends of the hairpin, and

Fig. 8 is an end view of the latching end of the hairpin.

In the drawing in which similar characters of reference refer to similar elements throughout the several views, my curl forming device comprises two separate units. The first of these units, which for convenience may be referred to as the curler 10, is used to roll a lock of hair into a curl, while the hairpin 12 comprises the second unit and is used to hold the curl in place until the curl sets. Thus, one curler 10 suffices to roll any number of curls, while a separate hairpin 12 is necessary for each of the curls so formed.

The curler 10 comprises a cylindrical mandrel 14 provided with a cylindrical extension or handle 16 of smaller diameter. A knob 18 at the end of the handle serves to improve the appearance of the curler and also aids in its manipulation. For reasons of appearance, lightness and cost of manufacturing, I prefer to form the mandrel 14, handle 16 and knob 18 as a unitary piece of molded plastic, such as "Bakelite" or "Plaskon," for instance.

The mandrel 14 is provided with a plurality of longitudinal flutes 20 extending from near the juncture of the mandrel and handle to the opposite end of the mandrel. The preferred embodiment illustrated shows four of these flutes, but it will be appreciated that a different number could be used.

A clip 22 has downwardly extending wings 24 which straddle the handle 16 and are pivoted thereto by means of a pin 26 extending through the handle and through apertures in the wings 24. This pin 26 should extend through the handle in a direction normal to a plane passing through the axis of the mandrel and the axis of one of the flutes. The rearward portion of the clip is inclined upwardly and outwardly toward the knob 18 to form a button 28 which, when depressed, will rock the clip about the pin 26. The portion of the clip opposite the button 28 forms a slender finger 30 extending almost to the end of the mandrel. This finger 30 is U-shaped in cross-section and lies with its convexly curved surface in comparatively close contact throughout its length with the bottom of one of the flutes 20. The size of this finger 30 is such that when positioned in the bottom of its co-operating flute, the top edges 32 thereof lie somewhat below the top edges of the flute, as best seen in Fig. 4. The reason for this arrangement will appear presently hereafter.

It should be particularly noticed that by providing a finger having a groove 34 therein along its entire length, and by curving this finger in a direction opposite to that usually employed on curlers and curling irons, I, in effect, create an additional flute along the surface of the mandrel similar to the other three flutes 20. That is, with the finger of the clip resting within one of the four flutes 20, the three other flutes 20, plus the concave upper surface 34 of the finger 30, form four equally spaced flutes extending longitudinally of the mandrel.

The finger 30 is normally resiliently pressed into a flute in the mandrel by a spring 35. This spring consists of a bent piece of spring wire, one end of which is press fitted into a hole 37 in the mandrel 14 and the opposite end of which projects downwardly to form a stop 39 to abut against the handle 16 when the button 28 is depressed. An intermediate portion 41 of the spring is curved upwardly to press against the lower

surface of the button 28 to urge this button upwardly.

My improved hairpin 12 comprises a length of steel wire having a U bend 36 near its mid point. The two arms extending outwardly from this U bend may, for convenience, be referred to as a lower arm 38 and an upper arm 40. The pin should be so shaped that when the arms of the pin are free, the lower arm 38 will be straight throughout its length, which is slightly greater than two inches. The upper arm 40 extends from the lower arm at an angle of approximately 13° and is straight for a length of ¾ of an inch or so over a portion 42 adjacent the bend 36, and then is bowed outwardly away from the lower arm over a developed length of another ¾ of an inch at 44. This curvature is such that the remainder 46 of the upper arm, which is straight, makes an angle of about 43° with the lower arm 38.

The free end of the upper arm is bent downwardly at right angles for a short distance, and then is bent around to form a U-shaped hook 48 to engage the free end of the lower arm. The outwardly bowed portion 44 is provided with a plurality of waves or reverse bends to prevent the hair from slipping. I have found that this pin serves its function best when manufactured of spring steel wire of approximately 20 gauge.

When the hairpin is closed, as shown in Fig. 6, the bowed portion 44 is brought into close association with the lower arm 38, and in fact the two arms 38 and 40 are quite close to parallel throughout their lengths, thus preventing bunching of the hair at the center of the pin, as would happen if the two arms of the pin were straight.

It should also be noted that the relative lengths of the upper and lower arms are such that the free end 50 of the lower arm does not project outwardly beyond the U-shaped hook 48. By thus proportioning the two arms, no projecting points are formed which might catch in the hair or cause injury.

For the use to which this hairpin is intended, it is important that the lower arm 38 be straight, as will appear presently.

In use, the curler is opened by depressing the button 28 and the end of the lock of hair is inserted between the mandrel 14 and finger 30, as illustrated in Fig. 1. The button 18 is then released to clamp the end of the lock of hair and the mandrel rotated to wind the hair thereon. When the hair has been wound upon the mandrel to the desired extent, the lower arm 38 of the hairpin is slid along one of the flutes 20, or along the concave surface 34 of the finger 30, and the free ends of the hairpins snapped together to confine the curl between the two arms of the pin. The button 28 is then slightly depressed to free the end of the lock of hair from confinement beneath the finger 30, and the mandrel is pulled from within the curl. This is particularly easily accomplished since the top edges 32 of the finger 30 lie beneath the surface of the mandrel, and consequently the finger may be raised slightly without the necessity of stretching the hair wrapped upon the mandrel. The curler may then be used to form another curl in a like manner.

I have found that the operation of inserting the hairpin into the curl is much more easily accomplished if the lower arm 38 of the hairpin is straight and free from wavy portions as shown.

The reason why I provide several flutes, including the one formed by the concave surface 34 in the finger 30, is that when the curls are formed, it is usually desirable to insert the hairpins as close to the scalp as possible to reduce to a minimum the length of uncurled hair. It is also desirable that the straight portion of any one curl be not substantially greater than the similar portion of another similar curl. Thus, with four flutes, the hairpin need never be inserted through the curl farther from the scalp than one-fourth the distance around the mandrel, whereas, if only one flute were provided, it would be necessary when forming the curls to secure the hairpin a distance from the scalp equal to almost the complete circumference of the mandrel in some instances. The effect of this would be that the variation in the length of the straight portion of the curls would be great, and some curls would not be formed as close to the scalp as is desirable.

What I claim as new and useful and desire to secure by Letters Patent of the United States is:

1. In a hair curling device for use with a cylindrical mandrel having longitudinal flutes extending to one end thereof about which a lock of hair is to be wound to form a curl, a hairpin having an upper arm and a lower arm, said arms being joined by a U-shaped bend at one end, the lower arm being normally straight throughout its length and adapted to slide along one of the flutes of said mandrel and through the curl thereon, the upper arm being substantially straight adjacent said bend with the outer free end portion curved outwardly away from the lower arm to provide a relatively wide gap between the free end portions of said arms when the hairpin is open, the free end of said outwardly curved arm being laterally bent to provide a latch for engagement with the free end of said lower arm when the hairpin is closed, and the degree of curvature of said upper arm being such that when the arms are closed and secured by said latch on a lock of hair the hair is compressed tightly along the entire length of the arms by the flexure tending to straighten the upper arm against the lower arm as a base of resistance so that the two arms will be approximately parallel in latched position.

2. A hairpin intended to secure a wound lock of hair to form a curl, comprising a lower arm, an upper arm, an acute bend connecting said arms, a latch at the free end of said upper arm to engage the free end of said lower arm when the pin is closed, said lower arm being substantially straight throughout its length to facilitate insertion of the hairpin through the curl, the major outer portion of said upper arm being curved outwardly away from the lower arm to provide a relatively wide gap between the free ends of said arms when the hairpin is open, and the degree of curvature of said upper arm being such that when the pin is closed upon a lock of hair, the flexure tending to straighten said upper arm will be compensated for by the flexure tending to curve said lower arm by pressure thereagainst so that the two arms of said hairpin will be approximately parallel throughout their length when locked upon a lock of hair.

ARTHUR W. WOODFORD.