March 19, 1946. S. GRANT 2,396,782

CURLING ROD FOR PERMANENT COLD WAVING OF HAIR

Filed Aug. 14, 1944 2 Sheets-Sheet 1

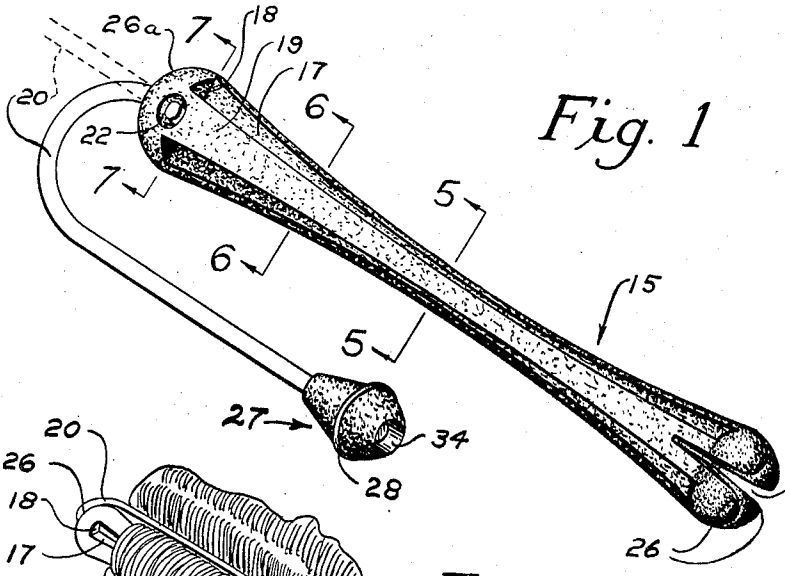

Fig. 1

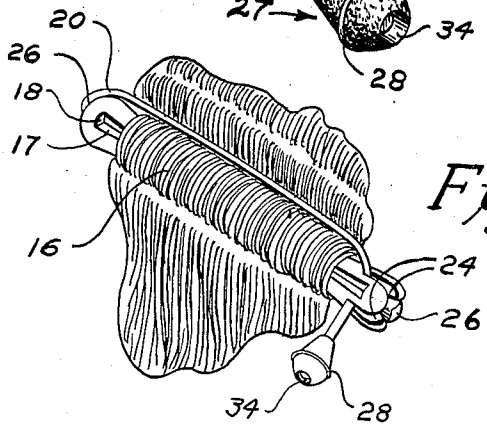

Fig. 3

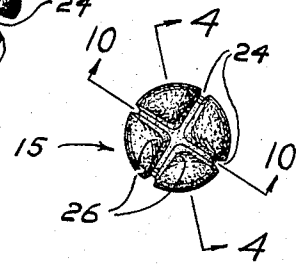

Fig. 2

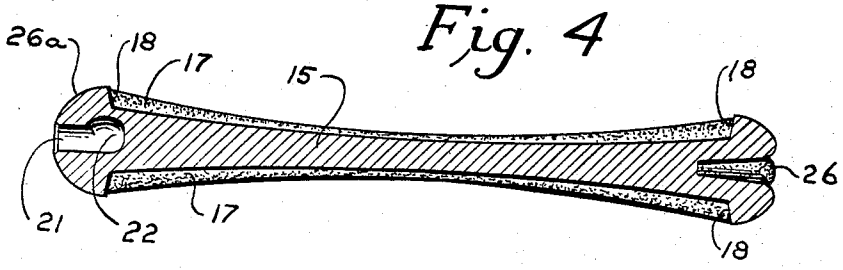

Fig. 4

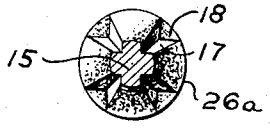

Fig. 5

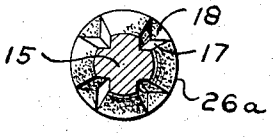

Fig. 6

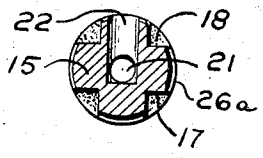

Fig. 7

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March 19, 1946. S. GRANT 2,396,782

CURLING ROD FOR PERMANENT COLD WAVING OF HAIR

Filed Aug. 14, 1944 2 Sheets-Sheet 2

Fig. 8

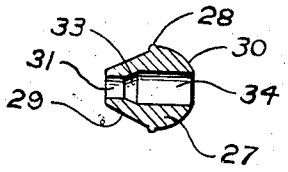


Fig. 9

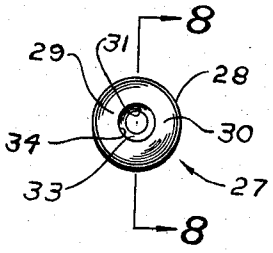
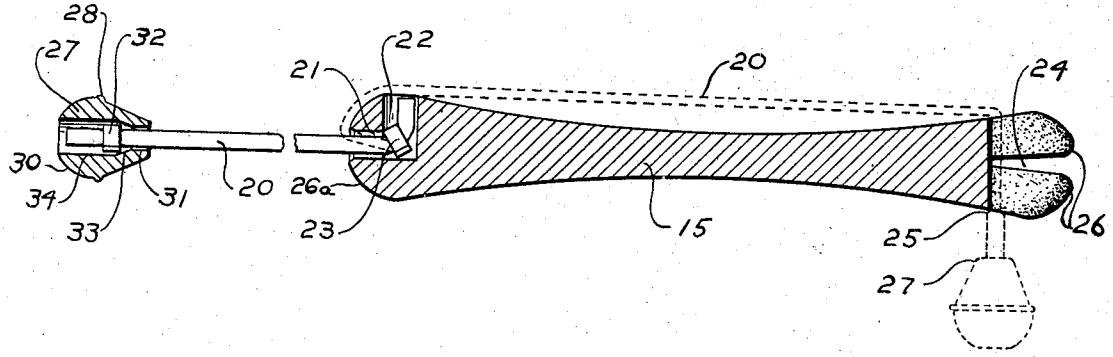


Fig. 10



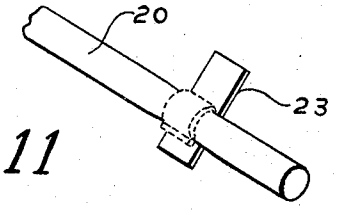


Fig. 11

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CURLING ROD FOR PERMANENT COLD WAVING OF HAIR

Samuel Grant, Chicago, Ill., assignor to Products Development, Inc., Chicago, Ill., a corporation of Illinois

Application August 14, 1944, Serial No. 549,332

5 Claims. (Cl. 132—42)

This invention relates to a new and improved curling rod for permanent waving of hair and more particularly concerns such a rod especially adapted for use in the process commonly referred to as "cold waving" which is practiced with certain chemical solutions that are effective for curling the hair without the use of heat.

One of the important objects of the invention is to provide a hair curling rod for cold permanent waving which is particularly adapted to be molded from a suitable plastic material such as one of the thermo-plastics.

Another object of the invention is to provide a cold permanent hair waving rod of the foregoing character which, although made from a molded plastic material of which the molded surfaces are normally quite smooth and therefore very slippery in the presence of the cold waving solution, is so constructed that the slipperiness is substantially overcome to afford good digital traction and to facilitate winding of the hair tress thereon.

Another object is to provide a curling rod particularly adapted for cold permanent waving of hair and which has been devised to attain an especially thorough distribution of the waving solutions throughout the tress wound upon the rod.

Another object is to provide improved means in a cold wave curling rod for fastening the tress and rod against unwinding.

A still further object of the invention is to provide an improved curling rod assembly which enables winding a tress especially close to the scalp.

Yet another object is to provide improved means for manipulating the fastening strand of a cold permanent hair waving rod.

Other objects, features, and advantages of my invention will be apparent from the following description and the accompanying two sheets of drawings, in which:

Figure 1 is an enlarged perspective view of a cold permanent hair waving rod embodying the features of my invention.

Fig. 2 is an end elevational view of that end of the rod with which the fastening strand is interengageable to secure the rod and a tress against unwinding.

Fig. 3 is a perspective view on a reduced scale showing a tress of hair wound upon the rod.

Fig. 4 is a longitudinal sectional view through the curling rod taken substantially in the plane of line 4—4 of Fig. 2.

Figs. 5, 6 and 7 are cross sectional views of the rod taken in the planes of line 5—5, 6—6, and 7—7, respectively of Fig. 1.

Fig. 8 is a longitudinal sectional view through the manipulating bead for the fastening strand, taken substantially on the line 8—8 of Fig. 9.

Fig. 9 is an end elevational view of the strand-manipulating bead.

Fig. 10 is a longitudinal sectional view through the rod assembly taken substantially in the plane of line 10—10 of Fig. 2.

Fig. 11 is a fragmentary perspective assembly view on an enlarged scale of one end of the locking strand and its anchoring member.

In the permanent cold waving of hair, the hair is divided into a large number of individual tresses, the tresses are individually thoroughly wetted with the cold permanent waving solution and are then wound upon separate curling rods for the duration of the waving process. After the waving solution has acted long enough according to one cold waving system, and while the curled tresses remain wound upon the rods, the hair is subjected to a neutralizing solution which stops further action of the waving solution. In another system, the hair is subjected to a plurality of different waving solutions and then neutralized. With some solutions no neutralizing is required. Finally the tresses are removed from the rods, rinsed, and dried.

Whatever the system, it is necessary in order to attain uniform curling of each tress, that the cold waving solution be thoroughly and uniformly distributed throughout the tress. Such uniformity of distribution of the liquid should persist through the entire period of treatment. Likewise, neutralizing of the waving solution should be effected uniformly and completely. According to my invention these desirable results are assured by the provision of new and improved features in my curling mandrel or rod 15. To this end, the curling rod 15 is characterized as to shape by substantial length and slenderness with the mid portion of uniformly contracted diameter gradually thickening toward the opposite ends of the rod to a substantially longer diameter. This enables a hair tress 16 (Fig. 3) to be wound substantially uniformly upon the rod 15, the thickest portion of the tress normally falling at the center of the rod and thinning out toward the ends of the rod to form a substantially cylindrical or at least only slightly centrally bulging roll upon the rod. In addition the gently curving concave slope towards the center of the rod tends to cause waving solution which is squeezed towards the

ends of the rods in the winding to travel back toward the greater central concentration of hair in the wound tress.

By my invention uniform distribution of the cold waving solution is further substantially enhanced by providing the tress-engaged surface of the rod with a plurality of longitudinal grooves 17 which will extend throughout the width of and preferably beyond each side of the wound tress. By preference four equidistantly spaced grooves 17 are provided, each being relatively narrow and shallow at the narrowest point of the rod (Figs. 4 and 5) and gradually increasing in width and depth and thus in cross-sectional flow area toward each opposite end (Figs. 6 and 7). This formation of the grooves is distinctly advantageous in that as the tress 16 is wound upon the rod excess waving solution which is squeezed laterally as the result of the winding tension on the hair or squeezing manipulation thereof by the operator will flow unrestrictedly along the grooves without capillary or frictional resistance. Abrupt shoulders 18 at the ends of the grooves retain the solution against leaving the respective grooves. In cross-section the grooves 17 may be of any desired contour, round, flat-rooted, or the like, but herein they are shown as V-shaped because that has been found quite desirable for molding purposes. The roots or converging innermost surface edges of the grooves 17 conform generally, though not in parallel relation, to the longitudinal concave curvature of the rods, and this concaveness taken together with the endwise widening and deepening of the grooves gives further assistance in distribution of the solution. When it is necessary to add solution after the tress 16 has been wound upon the rod, the grooves 17 are advantageous for effecting deep penetration of the wound tress by conveying the added solution to the hair most closely embracing the rod.

In addition to the solution-distributing function of the grooves 17 they also serve as slip-resisting or traction means to facilitate winding of the tress 16 onto the rod. That is the grooves function to counteract the tendency of the hair to slip on the rods, especially in the presence of the lubricating effect of the waving solution. For this purpose the longitudinal edges of the grooves 17 are preferably relatively abrupt, that is they meet the outer surface of the rod on angular lines.

As described up to this point, the curling rod 15 could be made of most any suitable material since the features set forth would lend themselves well to the manufacturing processes involved in the use of various materials. However, where the rod 15 is made from a moldable thermo-plastic material such as polystyrene, or the like, a high degree of uniformity in production can be obtained with great facility and high speed mass production methods. One disadvantage of this type of molded plastic is that the surface is normally of such smoothness that the lubricating effect of the hair waving solution thereon renders it quite slick and difficult to manipulate because the hair and the operator's fingers have an undue tendency to slip. This is often true even where irregularities or intentional gripping surfaces are molded directly in the traction surfaces because such molded irregularities are themselves essentially smooth.

According to the present invention this disadvantage of undue initial surface smoothness of the curling rod 15, especially where made of a molded thermo-plastic substance is quite effectively overcome by roughening the smooth molded surface after the rod has been delivered from the mold. There are several ways in which this surface roughening can be accomplished such as by sand blasting or by etching as by spraying with acetone. But another way to secure this important result is by tumbling the rods in the presence of granular particles of thermo-plastic material of a greater degree of hardness than the material of which the rod is made. Thus, where the rod 15 is made from a thermo-plastic material such as polystyrene having characteristic toughness yet relative softness which renders the surface relatively easily subject to abrasion, good results may be secured by tumbling the rods in the presence of a granulated phenolic condensation product such as that known to the trade as Bakelite. A batch of the curling rods 15 and the relatively sharp, harder Bakelite particles is tumbled until the surfaces of the rods have acquired what to the eye appears as a lightly frosted finish. Examined under magnification the rod surface shows multitudinous indiscriminate indentations, scarifications, abrasions, and gougings of ample depth and jaggedness of outline and in such close profusion but yet of relatively superficial character as to afford ample explanation for the frosted or dull appearance of the surface. The superficiality of the roughening is such, however, that it feels and looks pleasantly soft and rich, preferably enhanced as to appearance by a pleasing undertone shade of coloring in the body material itself. For example, various sizes of rods may be appropriately identified by different colors or shades of colors.

One disadvantage of the tumbling method, however, is that the roughening within the depths of the grooves is less than could be desired, for such roughening tends to avoid the formation of flow-retarding menisci of the solution in the grooves. Further, if loose hair strands from the tress lodge in the grooves the surface roughness in the grooves tends to prevent such liquid-induced adherence to such walls as would prevent flow of solution in the grooves. Therefore, an etching or sandblasting type of roughening offers some advantages.

Although Fig. 1 illustrates the surface roughening at 19 by fine stippling, it is to be understood that this is a very imperfect illustration of the true condition which is of a much more uniformly diffused nature than it is possible to illustrate adequately in a pen and ink drawing. A diligent effort has, however, been made to show how the roughening thoroughly covers the traction surfaces of the rod and how the innermost portions of the surfaces of the grooves 17 are at least somewhat roughened. Immediately adjacent to the outer edges of these groove surfaces the roughening is particularly advantageous in supplementing the traction effect of the groove edges for retaining the hair tress against slipping on the rod 15.

After the tress 16 has been fully wound upon the rod 15, it is necessary to fasten it against unwinding. Herein this is accomplished in an improved manner by a flexible fastening element in the form of a strand 20 which is preferably elastic, made from rubber or other rubber-like material, and of a contracted length preferably equivalent to or somewhat shorter than the rod 15, but in any event preferably such as to compel stretching thereof when securing it against the strand as will be described. One end of the fastening strand 20 is secured to one end of the rod 15, which may for convenience be designated the base end, as by having the end of the strand

anchored within the distal end enlargement as best seen in Fig. 10. Accordingly, the strand extends through a short axial bore 21 opening through the extremity of the rod and communicating with a converging transverse, laterally opening entrance bore or lead-in 22 which is preferably of somewhat larger diameter so as to be capable of receiving an anchoring ferrule 23 secured upon the associated end portion of the strand. As shown in Fig. 11 the anchoring ferrule 23 may comprise an initially flat strip of bendable metallic material such as aluminum or non-metallic material such as a pliable plastic, which is curled about the end portion of the strand and clenched in place so that it will not pull off. In assembling the strand 20 with the curling rod 15 the free end of the strand is threaded through the converging bores 21 and 22 by starting it through the lead-in 22 and then drawing the strand out through the axial bore 21 until the anchoring ferrule 23 comes to a stop and is held against further onward movement at the shoulder defining the inner end of the smaller diameter axial bore 21 which is too small to pass it. The fastening strand 20 may be round, square, or any other shape in cross-section and may have any surface characteristics such as ribbing, crinkles, special flutes, or the like desired to meet various requirements. Instead of being equipped with the anchoring ferrule 23, the end of the strand 20 may be tied in a knot or formed with an integrally molded knob or anchoring protuberance or bulb which is large enough to enter the lateral bore 22 and too large to pass through the axial bore 21 even when the strand 20 is stretched to the limit of elasticity.

Fastening of the rod 15 and the wound tress 16 against unwinding is accomplished by stretching the fastening strand 20 across the base portion of the tress 16 and then engaging the strand with means provided for this purpose at the head end of the rod. Herein such means preferably comprises a bifurcated construction of the enlargement of the rod (Figs. 1, 2 and 10). Accordingly, a pair of right angularly related, diametrical strand receiving slots 24 enter relatively deeply into and open axially from the head of the rod. At their mouths the cruciform slots 24 are of ample width to receive the strand 20 freely therein; but the walls of each slot converge wedge-like toward the base to what is, if not complete convergence, at least so close a spacing as to be substantially narrower than the strand and to effect a secure binding of the fastening strand therein even when stretched to its elastic limits. When the stretched fastening strand 20 is secured in the selected slot 24 the strand elasticity permits the strand to be forced well down into, if not entirely to the root of the slot. The deeper the strand is forced toward the root of the slot the more secure will be the grip thereon by the walls of the slot when the strand is released from the operator's fingers. The end portion of the strand which has been drawn beyond the edge of the securing slot will, upon release of the manipulative securing tension, resume its normal diameter or thickness as indicated in broken outline in Fig. 10 and will provide a shoulder 25 engageable with the slot edges which assist in retaining the strand in the secured or fastened position.

Traction against loosening and slipping of the fastening strand 20 in the slots 24 is provided by roughening of the slot surfaces similarly as and preferably coincident with the roughening of the exterior traction surfaces of the rod 15 as hereinbefore described. Should the roughening not cover the slot walls far enough into the slots as a result of tumble-roughening, for example, extension of the roughening may be effected to advantage by sandblasting or dip or spray etching, or by brushing on an etching solution.

An important result of the bisecting relationship of the fastener securing bifurcation slots 24 resides in the ability thus to secure the fastening strand 20 in the closest practicable approach to the scalp at the base of the tress 16 (see Fig. 3). In other words, the beauty operator may enter the fastening strand 20 into the leading side of whichever one of the slots 24 ends up in proper relationship after a winding operation to receive the fastener at the desired position across the base of the tress.

In order to facilitate manipulation of the fastener strand 20 into the selected securing slot 24, the head extremity of the rod is rounded off to avoid resistance to sliding of the fastener strand 20 thereover. The curvature is preferably substantially hemispherical with the base diameter approximately coinciding with the adjacent ends of the grooves 17. In addition the corners of the head at the intersection of the securing slots 24 are neatly rounded off as indicated at 26 (Figs. 1 to 4, inclusive, and 10). This rounding off of the head and the corners 26 more than counteracts the possible retarding effect upon free slipping manipulation of the fastening strand over the roughening 19 of these surfaces, especially when the surfaces are wet and lubricated with the waving solution. Thus, the fastening strand 20 will conveniently slide over the rounded surfaces under the guidance of the operator's fingers while maintained under tension for fastening and can be easily and quickly inserted within either of the securing slots 24, or about the base of one of the finger-like subdivisions of the slotted head, partially within both of the slots as shown in Fig. 3.

Swivelling of the base end portion of the fastening strand 20 about the base end enlargement of the curling rod 15 is facilitated by forming such enlargement hemispherically as indicated at 26a. Thus the fastening strand 20 will readily assume a straight line across the base of the tress 16, substantially parallel to the axis of the rod when stretched into fastening position.

Although the fastening strand 20 is quite securely held within either or a combination of the securing slots 24, under any selective or adjusted degree of tensioning permitted by the elastic limits of the strand, it can be quite readily released merely by digitally withdrawing it from its slot-engaged position so that it may contract resiliently and draw away from the tress 16. By preference the resiliency and body of the strand 20 are such that when free and contracted the strand normally tends to straighten out and extend axially from the distal or base end of the rod 15, as indicated in broken outline in Fig. 1 and full outline in Fig. 10. This feature is of considerable advantage both during winding and unwinding of the tress 16 because at these times the tying strand automatically remains away from the tress and thus avoids becoming tangled with it. Hence the speed with which the winding or unwinding may be accomplished will never be retarded by a need for pulling the strand out of the way as might be a problem if the strand were a limp cord or the like.

Manipulation of the fastening strand 20 is fa-

cilitated by providing the free end thereof with a digitally engageable member such as a bead 27 (Figs. 1, 8, and 9). By preference, the bead 27 is formed from a thermoplastic material similarly as the rod 15. To facilitate manipulation thereof, the bead is preferably of relatively elongated form with its external surface interrupted intermediate its ends by an annular, radially protruding non-slip or traction rib 28, from which the bead periphery recedes rearwardly as a rapidly diminishing frusto-conical finger-engagement surface 29. On the opposite or forward side of the rib 28, the bead periphery sweeps away in a curving, preferably hemispherical, contour to form an attractive head 30. For purposes of digital traction, and uniformity of appearance the surfaces of the bead may be roughened similarly as the traction surfaces of the rod 15.

For assembly of the manipulating bead 27 with the fastening strand 20, the bead is formed with an axial bore 31 into which the free end of the fastening strand 20 extends. Separation of the bead and fastening strand is prevented by an anchoring device such as a ferrule 32 (Fig. 10) which may be secured onto the end portion of the strand in similar manner as the ferrule 23 which is adjacent the opposite end of the strand. The anchoring ferrule 32 is adapted to engage a retaining shoulder 33 at the base of an enlarged portion 34 of the strand receiving bore. Through this arrangement, the fastening strand 20 can very conveniently be manipulated by reason of the firm tensioning grip obtainable thereon through the medium of the bead 27.

While I have illustrated and described a certain preferred embodiment of my invention, it is to be understood that I do not thereby intend to limit my invention to the specific details disclosed, but contemplate that various modifications, substitutions, and alternative construction may be effected without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. In a hair curling rod especially adapted for use in cold permanent waving of hair, an elongated body shaped to facilitate winding of a hair tress thereon, said body having longitudinal grooves adapted to facilitate uniform distribution of the hair waving solution, the surfaces within said grooves being roughened to assure relatively free flow of the solution in the grooves.

2. In a hair curling rod adapted for use in permanent cold waving of hair, an elongated rod body molded from a plastic material presenting initially relatively smooth surfaces which become slippery in the presence of the waving solution, grooves adapted for conducting waving solution and extending lengthwise of the rod body to underlie a hair tress wound upon the body, said grooves being formed to afford winding traction for the tress, the surfaces of the rod body adjacent to the grooves being artificially roughened to supplement the traction of the grooves, and the walls of the grooves being roughened to avoid formation of flow retarding menisci of solution in the grooves and thus facilitate free flow of the solution along the grooves.

3. In combination in a permanent waving hair curling rod assembly, a rod providing a mandrel for receiving a hair tress wound thereon, an elastic fastening strand assembled with one end of the rod, the opposite end of the rod being bifurcated with the bifurcation providing a mouth wide enough to receive the fastening strand freely and a root portion substantially narrower than the strand to receive the latter with a firm squeezing grip when the fastening strand is forced into the bifurcation as an incident to securing the strand in place to fasten the tress against unwinding from the rod, and anti-slip means within the bifurcation for gripping the fastening strand and counteracting the lubricating characteristics of waving solution that may be present when the strand is secured in place.

4. In combination in a permanent waving hair curling rod assembly, an elongated curling rod body adapted to have a tress wound thereon, and a fastening strand connected to one end of the rod body for fastening the wound tress against unwinding, the opposite end of the rod body having intersecting wedge-shape slots adapted to receive the fastening strand wedged into the narrow portions thereof to secure the strand in fastening position and dividing this end into a plurality of finger-like projections, the inside corners of the projections at the intersecting mouths of the slots being free from sharp edges or points and sloping inwardly to facilitate passage of the fastening strand thereover and about any selected one of the projections, thereby enabling the closest possible basal engagement of the fastening strand with the tress.

5. In a hair curling rod structure especially adapted for use in cold permanent waving processes wherein a hair tress while wound on the rod is saturated with one or more solutions, an elongated body providing a winding mandrel, said body having a plurality of longitudinal solution receiving and distribution grooves extending throughout its tress-receiving extent, said grooves being of V-shape cross section, and the walls of the V-shape grooves being superficially roughened to avoid meniscus retardation of solution flow therein.

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