

April 1, 1958

L. E. HALL

2,828,702

MACHINE FOR ROOTING HAIR

Filed Sept. 10, 1953

5 Sheets-Sheet 1

FIG. 1.

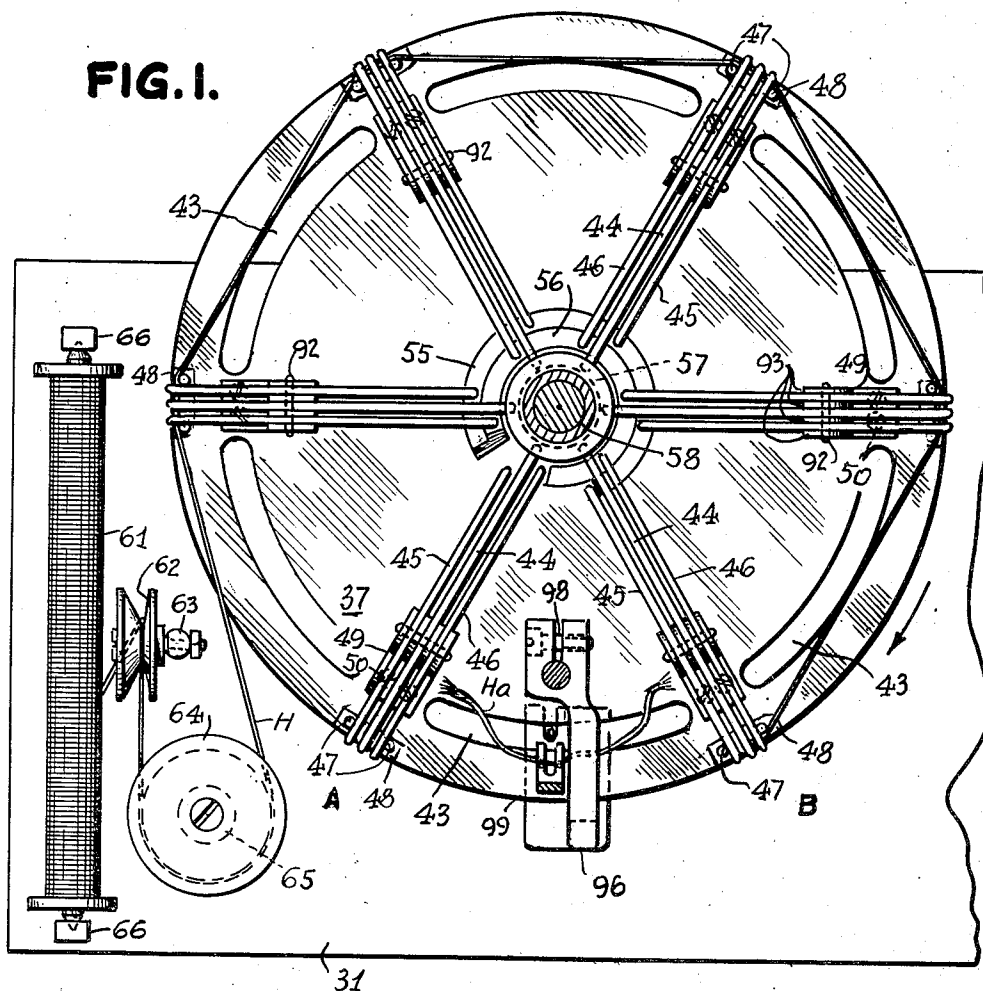


FIG. 3.

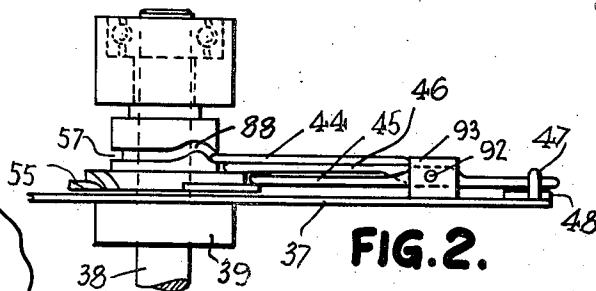
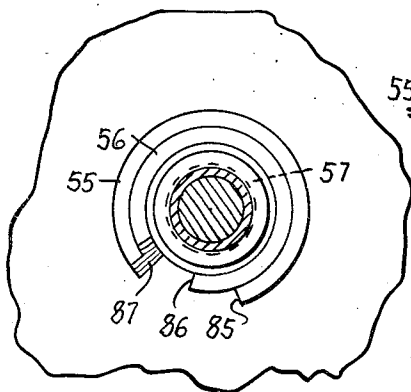


FIG. 2.

INVENTOR.
LAWRENCE EDGAR HALL.

BY

Ervin H. [Signature]
ATTORNEY.

April 1, 1958

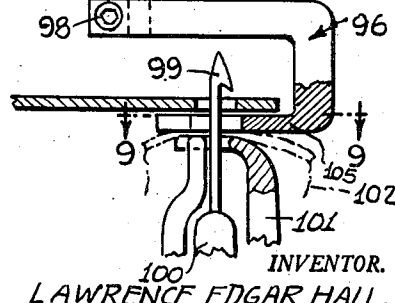
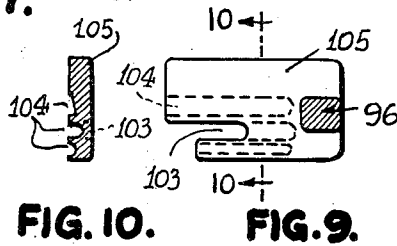
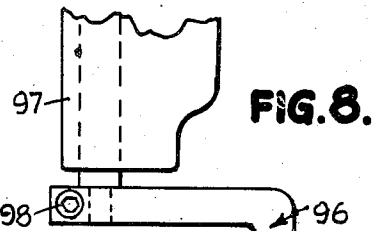
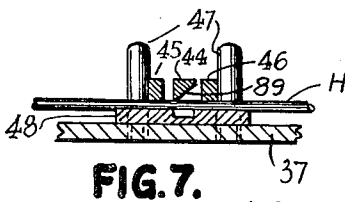
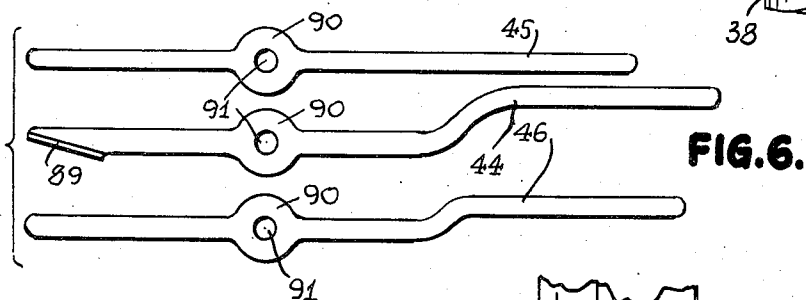
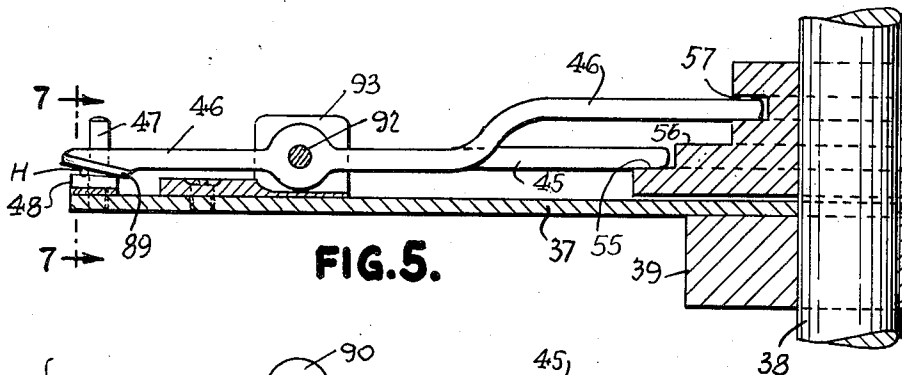
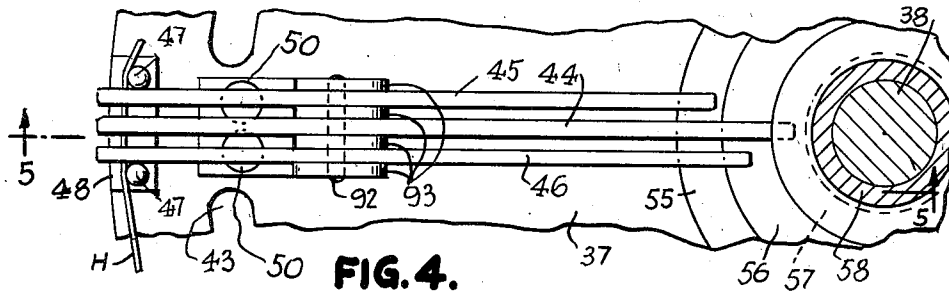
L. E. HALL

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5 Sheets-Sheet 2



100 INVENTOR.
LAWRENCE EDGAR HALL.

BY

BY
Ben Spaulding
ATTORNEY.

April 1, 1958

L. E. HALL

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5 Sheets-Sheet 3

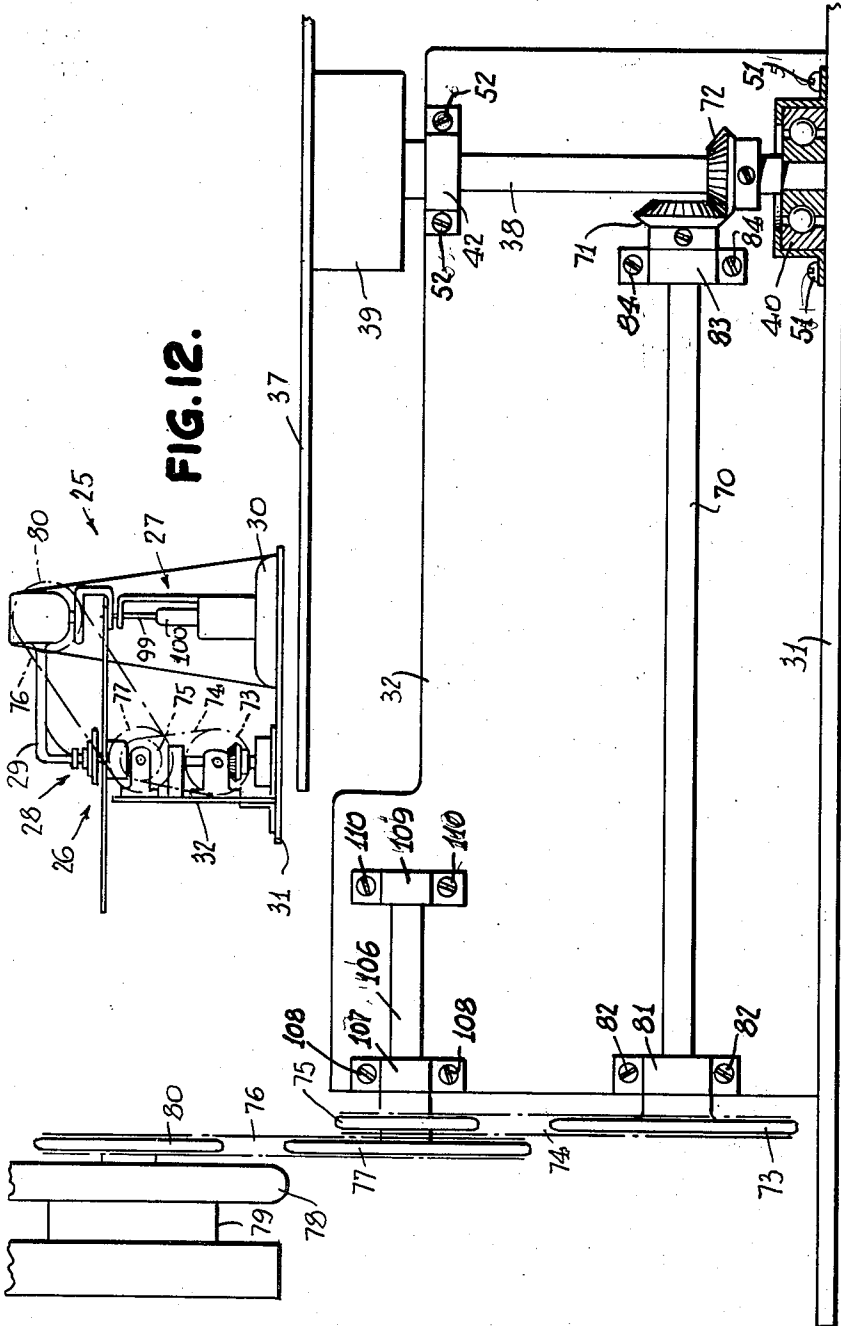


FIG. 12.

FIG. 11.

INVENTOR.
LAWRENCE EDGAR HALL.

BY

John H. McElhiney

ATTORNEY.

April 1, 1958

L. E. HALL

2,828,702

MACHINE FOR ROOTING HAIR

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5 Sheets-Sheet 4

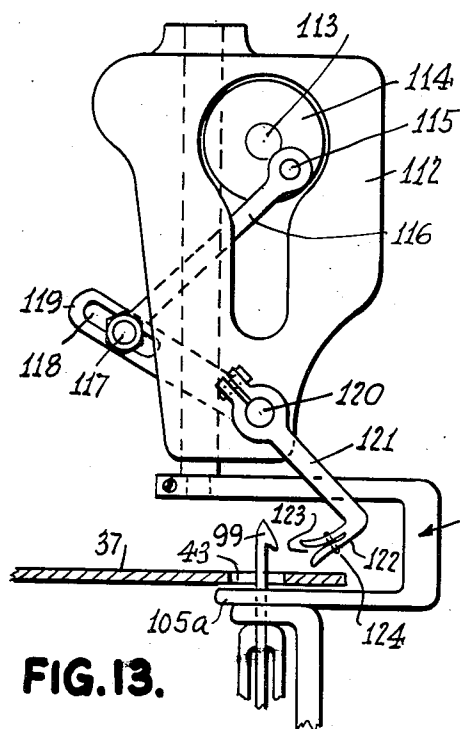


FIG. 13.

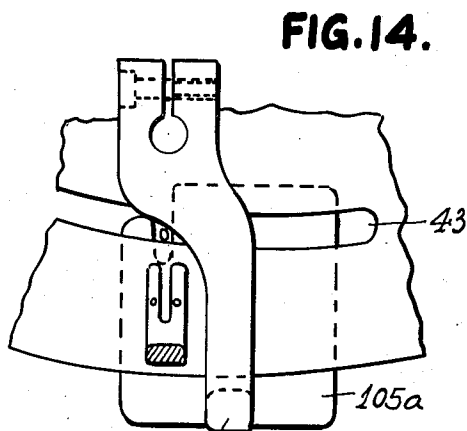


FIG. 14.

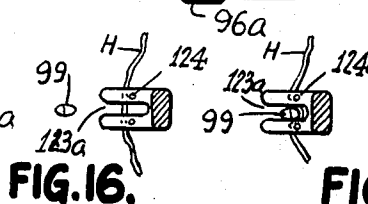


FIG. 15.

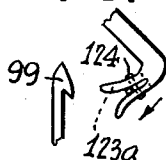


FIG. 16.

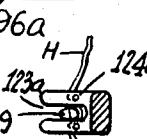


FIG. 17.

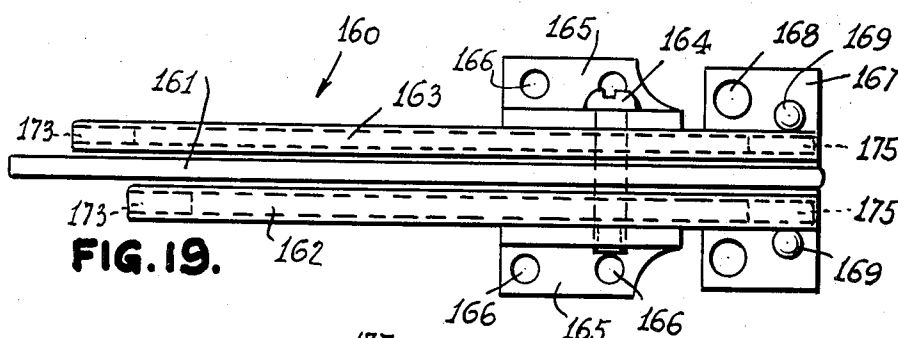


FIG. 18.

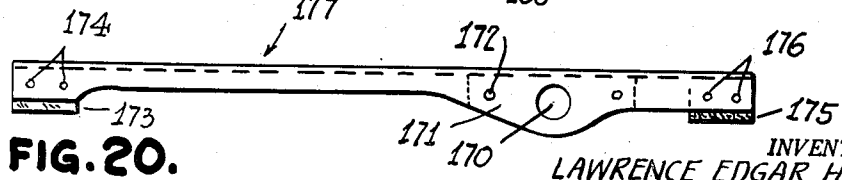


FIG. 19.

INVENTOR.
LAWRENCE EDGAR HALL.

BY

ATTORNEY.

April 1, 1958

L. E. HALL

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5 Sheets-Sheet 5

FIG. 21.

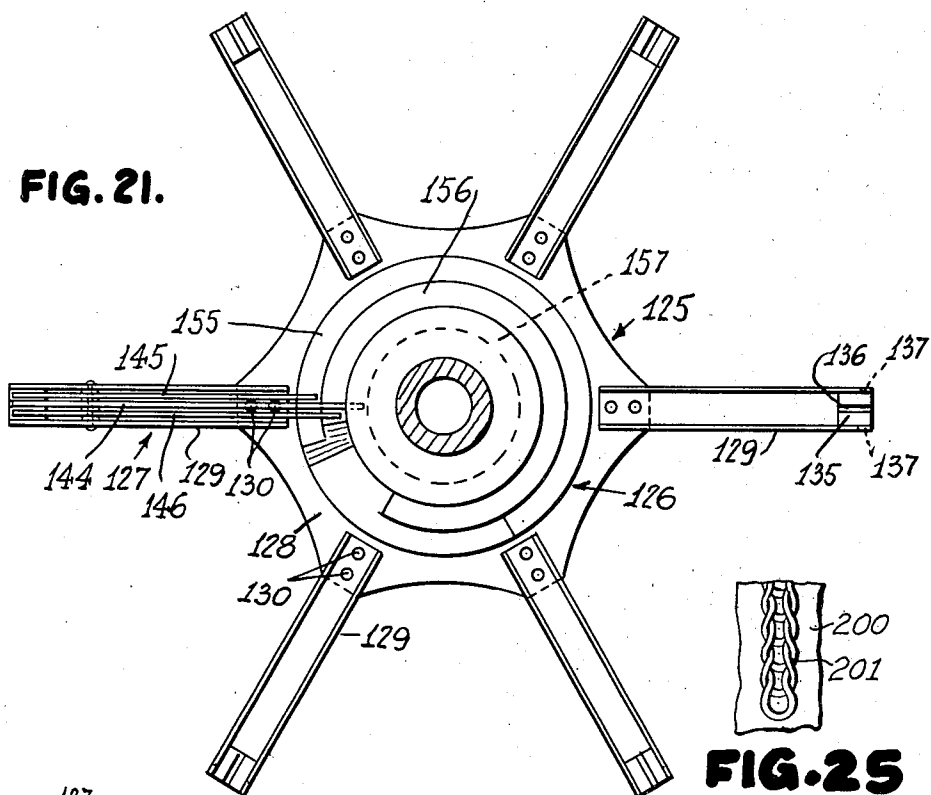


FIG. 25

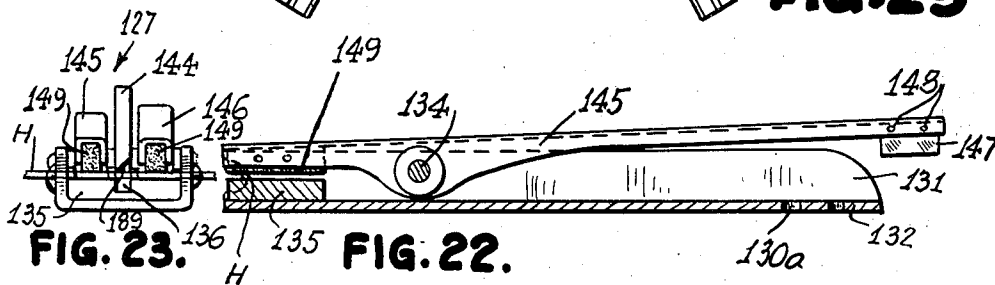


FIG. 23.

FIG. 22.

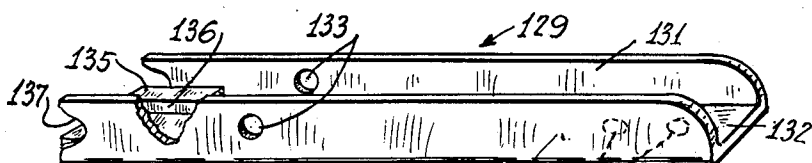


FIG. 24.

INVENTOR.
LAWRENCE EDGAR HALL.
BY

ATTORNEY

1

2,828,702

MACHINE FOR ROOTING HAIR

Lawrence Edgar Hall, Flushing, N. Y.

Application September 10, 1953, Serial No. 379,432

11 Claims. (Cl. 112—79.5)

This invention relates broadly to the provision of a chain-stitch producing mechanism for rooting hair into the scalp of a doll, and it has specific reference to a mechanism whereby a continuous strand of simulated hair-like fibre may be cut at predetermined intervals and the cut fibre may be engaged by the vertically reciprocating hooked needle of the mechanism and rooted in the hollow interior of the scalp.

This invention is a supplement to the invention made by the present applicant for which Letters Patent #2,686,305 has been granted on August 10, 1954. The invention covered by the patent relates broadly to an attachment for use in connection with strands of pre-cut hair. It has been found that doll heads may be provided with rooted hair at a more rapid rate of speed, hence at greatly reduced cost if, instead of using pre-cut hair, hair is cut from a continuous strand.

It is the principal object of the present invention therefore, to provide an attachment for a chain-stitch producing mechanism having a hooked, vertically reciprocating needle, the attachment having means to carry a portion of a strand of hair-like fibre at proper tension to the cutting edge of a blade, where it is cut into segments of predetermined length.

It is a further feature of the present invention to provide an attachment for the chain-stitch producing mechanism hereabove mentioned, which will hold a continuous strand of hair firmly and securely against premature disengagement and which will release the portion of hair to be rooted at the moment of its engagement by the needle.

And it is a still further purpose of the present invention to provide an attachment for a chain-stitch producing mechanism of the character described including a disc having means at predetermined intervals to grip and releasably retain a portion of a strand of continuous hair-like fibre and to carry the fibre into alinement with the vertically reciprocating needle of the mechanism where the fibre is cut, released from the grip of the gripping means, engaged by the hooked end of the vertically reciprocating needle, advanced through the scalp and rooted in the hollow interior of the doll's head.

And yet another aim of the present invention lies in the provision of an attachment for a chain-stitch producing mechanism wherein the rotating disc is provided with means to brush the free ends of rooted hair out of the path of the vertically reciprocating needle.

And yet another feature of the present invention resides in the provision of means synchronized with the movement of the needle, whereby the cut portion of hair will be moved forward into alinement with the needle, the needle being adapted to pass through the holding means to engage the cut hair.

Another feature of the present invention resides in the provision of a method for rooting portions of a strand of continuous hair into a doll's head by the use of a chain-stitch producing mechanism having attachments adapted to produce the result outlined.

2

These and other meritorious aims and advantages, which will become more fully apparent as the description hereof proceeds, are attained by the novel construction, combination and arrangement of parts hereinafter described, and illustrated in the accompanying drawing, forming a part thereof. In the drawing:

Figure 1 is a top plan view of the attachment of the present invention, showing the slotted disc, the means for gripping hair, the release mechanism for the hair, the needle in the process of engaging a portion of cut hair and the presser foot of the mechanism, the view being partly in section.

Figure 2 is a partial and diagrammatic front view of Figure 1 showing in detail the track arrangement for the gripping elements and the blades.

Figure 3 is a top plan view of the track portion of the disc, the arms having been removed for greater clarity.

Figure 4 is a top plan view of one of the groups of arms and the track causing their proper function.

Figure 5 is a sectional view, the section being taken on line 5—5 of Figure 4.

Figure 6 is an exploded view of the two gripping arms and the intermediary cutting arm which comprises one of the several gripping and cutting elements.

Figure 7 is a sectional view of the cutting end of one of the elements, the section being taken on line 7—7 of Figure 5.

Figure 8 is a detail view of a portion of the needle end of the chain-stitch producing mechanism showing the needle having pierced the scalp and entered through the opening in the presser foot and one of the slots in the disc, the needle being shown at the termination of its upward stroke.

Figure 9 is a detail view on line 9—9 of Figure 8 showing the visual guide track of the presser foot.

Figure 10 is a sectional view, the section being taken on line 10—10 of Figure 9.

Figure 11 is a diagrammatic elevational view of the drive arrangement for the attachment of the present invention.

Figure 12 is a front end view, drawn to a reduced scale, of a chain-stitch producing mechanism, which has been provided with the attachment constituting the present invention.

Figure 13 is a front elevational view of an arrangement whereby a cut portion of hair is lifted from the gripping element and carried over and into alignment with the needle.

Figure 14 is a plan view of the presser foot with a portion of the disc and arm shown in section.

Figures 15 through 18 are diagrammatic views showing the relative position of pusher and needle at different stages of the hair rooting process.

Figure 19 is a top plan view of a modified form of gripping assembly.

Figure 20 is a side elevational view of one of the arms shown in Figure 19.

Figure 21 is a top plan view of a modified form of rotating member.

Figure 22 is a sectional view of one of the arms of Figure 21 in operative position.

Figure 23 is an end view of the gripping and cutting members shown in Figure 21.

Figure 24 is a perspective view in detail of one of the arms shown in Figure 21.

Figure 25 is a portion of a doll's scalp, having rooted hair produced by the use of the present invention.

Referring in greater detail to the drawings, the numeral 25 illustrates in general a high post, chain-stitch producing mechanism for which the attachment of the present invention has been made, the numeral 26 refers broadly

3

to the attachment of the present invention, the numeral 27 refers broadly to the needle end of the mechanism, the numeral 28 refers broadly to the gripping arms and the track which constitute a part of the present attachment, the numeral 29 refers to the track support, the numeral 30 refers to the base of the mechanism, base 30 being mounted in any suitable and desirable manner upon one end of a base plate 31 the other end of base plate 31 having an upright wall 32 mounted thereon, all of these parts being broadly illustrated in Figure 12 of the drawing.

Referring to these several parts in more complete detail, the invention comprises a disc-shaped wiper 37 having an opening centrally thereof, on the underside of which there is provided a hub 39, by which the disc 37 is rotatably mounted upon a vertical drive shaft 38, the other end of shaft 38 having a conventional anti-friction box 40 secured to base plate 31 by screws 51 or otherwise, as is illustrated in Figure 11 of the drawings. The upper end of shaft 38 where it engages hub 39 of disc 37 rides in a conventional anti-friction box 42 secured to upright wall 32 in the mechanism or any other suitable and desirable location, by screws 52 or otherwise.

Near its outer edge, disc 37 is provided with a plurality of spaced-apart, elongated, peripheral slots 43, six such slots being illustrated in the drawings. The number of such slots may vary depending upon the requirement of the user. Mounted radially upon disc 37, between each pair of adjacent slots 43 is a cutting arm 44, which is preceded by a lead gripping arm 45 and spaced therefrom, and followed by a follower gripping arm 46, spaced from the cutting arm 44. Inasmuch as there are six slots 43 shown in the drawing, six of the elements 44, 45 and 46 are required and are shown. The number of these elements will obviously vary with the number of slots 43. Adjacent the front end or tip of lead gripping arm 45 and follower gripping arm 46, slightly inside the outer edge of disc 37 are a pair of stops 47 secured to plate 48 by soldering or otherwise, plate 48 being secured at the edge of disc 37 in any desirable and suitable manner. At a point here illustrated as being substantially $\frac{1}{3}$ the distance from the edge of disc 37 is a hinge plate 49 secured to disc 37 by screws 50 or otherwise. The purpose of the stops and the hinge plate will presently become apparent.

Surrounding the shaft 38 is a sleeve member 58 of support arm 29 the other end of support arm 29 being fixed to the head of the mechanism as is illustrated in Figure 12. Secured edgewise to the stationary sleeve is a disc-like cam track 57 for the other end of the knife arm 44, track 57 being of larger diameter than sleeve 58. About the track 57 is a ring-like cam track 56 for the follower gripper 46 of larger diameter than those heretofore mentioned, and about track 56 is a ring-like cam track 55 of still larger diameter. Sleeve 58 as well as the three tracks hereabove referred to are stationarily mounted about shaft 38.

One of the many ways in which hair may be fed from a spool or bobbin to the gripping element of the disc is illustrated in Figure 1. In this illustration, a spool 61 upon which is wound a continuous strand of simulated hair is placed upon a support 66 in a conventional manner, the spool being rotatably held on the support. The support 66 will be positioned in close and convenient proximity to the disc 37. Adjacent the spool substantially midway of its length and spaced therefrom a support 63 for vertically arranged wheel 62 may be provided, beneath which there may be another support 65 for another wheel 64, the function of all of which will be further explained presently. However, applicant will not necessarily use this method, since it may be found to be more desirable and simpler to place the spool containing hair upon the conventional pin conventionally provided upon a chain-stick producing mechanism.

One of the arrangements for activating the attachment

4

of the present invention is illustrated in Figure 11. In this illustration, a horizontal drive shaft 70 has one of its ends rotatably mounted in a conventional anti-friction box 81 which is secured to the inner face of the head of the mechanism by screws 82 or otherwise. Its other end, that is, the end near the needle part of the mechanism is held in a conventional anti-friction mounting 83 which may be secured to the wall of support 32 by screws 84 or otherwise is provided with a vertical gear 71 in mesh with a horizontal gear 72 at the lower end of vertical shaft 38. On the outer face of support 32, the rear end of shaft 70 is provided with a sprocket 73 joined by chain 74 or otherwise to sprocket 75 above and in alignment with sprocket 73. Sprocket 75 is positioned near the end of a rotatably mounted horizontal shaft 106 which is shorter than and parallel with shaft 70 and spaced thereabove. Shaft 106 has one of its ends retained in a conventional anti-friction mounting 107 which is secured to support 32 by screws 108 or otherwise, its other end being also mounted in a conventional anti-friction box 108, secured to support 32 by screws 110 or otherwise. At that end of shaft 106 near which sprocket 75 is positioned, there is another sprocket 77 which has a larger diameter than sprocket 75, sprocket 77 being joined by chain 76 or otherwise to a sprocket 80 thereabove and in alignment therewith, sprocket 80 being spacedly connected to and adapted to be operated by the main drive 78 which is of conventional character and is provided with the conventional clutch 79.

Referring again to the cam tracks for the lead arm 45 and the follower gripper 46, the tracks being identified by the reference numerals 55 and 56 respectively, the said tracks having been described hereabove as being circular in cross-section. However, tracks 55 has a portion cut away, as at 85 and track 56 has a smaller portion thereof cut away, as at 86 which is where the said tracks end. The beginning of the tracks, identified by the reference numeral 87, is slightly tapered for a purpose which will presently become more fully apparent. Upon the disc 37 is provided a cam 88 for the knife arm 44 (see Figure 2), the front end of the knife arm 44 being provided with a blade or cutting edge 89. Near their front ends, elements 44, 45 and 46 are each provided with a pivot 90 having a central opening 91 therein for the passage of a pin 92 therethrough by which each group is secured to a guide 93 retained on disc 37 by screws or otherwise.

Presser foot 96 is here illustrated as being substantially channel-shaped in cross-section as illustrated in Figure 8, the free end of its upper horizontal arm being secured to presser foot support 97 by a set screw 98 or otherwise. Below the lower horizontal arm of presser foot 96 is positioned in a conventional manner the hooked needle 99 of the mechanism, the needle being adapted to pass upwardly through an opening in the lower horizontal arm of the presser foot provided for that purpose during its upward stroke and adapted to recede through that opening during its downward stroke. For the purpose of illustration, there is shown the conventional needle bar 100 also referred to as a needle support, and the conventional post 101. The lower horizontal arm of presser foot 96, referred to by the numeral 105, may be provided with a plurality of slots 103 and grooves 104 for a purpose which will presently be more fully explained.

As can be seen in Figure 1 of the drawing, when the hair is engaged by the several groups of grippers, it will be stretched adjacent the outer longitudinal edge of each of the several slots 43. Since the needle reciprocates near the inner longitudinal edge of each successive slot, a means has been provided to carry the cut strand of hair into position over the hooked end of the reciprocating needle. Towards that end, the pusher illustrated in Figure 13 has been developed. Head 112 is provided with an opening to gain access to the conventional horizontal drive shaft 113. Mounted upon the said drive shaft and

5

rotatable therewith is an eccentric 114 to which is secured by pin 115 a lever 116, the other end of lever 116 being retained by fulcrum 117 in slot 118 at one end of an angularly disposed lever 119, the other end of lever 119 engaging the fulcrum 120 of an arm 121. The free end of arm 121 is bent substantially rectangularly with respect to the rest of arm 121, the part so bent forming a fork 122. The forked end is provided with a transversely extending slot 123 and a horizontal slot 123a, so that the fork 122 actually comprises four pairwise arranged fingers. Near their center, each pair of fingers has a pin 124 extending downwardly therethrough.

The applicant has discussed in the principal embodiment of his invention, the use of a disc-shaped rotating member. However, applicant shows a modified form of rotating member in Figure 21. This modification comprises broadly a hexagon-shaped member 125 having a plurality of cam tracks 126 centrally thereof, and a plurality of radially extending arms 127, one at each of the points of the hexagon. Each of the said arms 127 is secured by rivets 130 or otherwise to rotating member 128, the rivets passing through openings 130a in each of the said arms 129. Each of the said arms 129 is substantially channel-shaped, having a pair of side walls 131 and a bottom 132. Near their inner ends, each side wall 131 is provided with an opening 133. At the front end of each of said channels is a block 135 having a cutting groove 136, the front edges of side walls 131 being provided each with a cut-out 137, the purpose of which will presently be explained.

Extending longitudinally across each of said channels 129 is a cutting arm 144, preceding which there is a lead arm 145 and following which there is a follower arm 146. These three arms are spaced apart and extend parallel to each other. The lead arm and the follower arm are preferably made of spring steel or other resilient material. At its other end, each arm is provided with a fulcrum block 147 preferably made of hardened steel, the said block 147 being secured by rivets 148 to the arm. At the other end of each arm, there may be provided a fiber block 149 to hold down the hair until it is released.

Centrally of member 128 is a ring-like cam track 157 surrounded by a larger cam track 156 which is surrounded by a still larger cam track 155. These tracks are stationary and are identical to the tracks referred to in connection with the principal form of the invention.

The arms may be modified as illustrated in Figures 19 and 20 wherein the numeral 160 refers broadly to a modified form of carriage for the gripping and cutting arms. The knife arm 161 is preceded by a lead gripping arm 162 and followed by a follower gripping arm 163 spaced from each other and parallel to each other. Near their inner ends, the said arms are secured by pins 164 or the like to angle clips 165, the angle clips being provided with openings 166 for the passage of screws or other fastening means therethrough, by which the arms are secured to the angle clips. Spaced from the angle clip 165 is a substantially rectangular plate 167 having a plurality of openings 168 therein for the passage of pins 169 therethrough by which the arms are secured at their inner ends to the said plate 167. At 170 there are indicated the openings in the angle clip through which pins 164 are adapted to be entered. A fulcrum piece 171 is secured to the angle clip over opening 170, the fulcrum piece being secured to the said angle clip by rivets 172 or the like. At the other end of each arm there is provided a fulcrum plate 173, preferably made of steel, secured by rivets 174 or the like to the forward end of each arm, as shown in Figure 20 of the drawings.

Between the steel fulcrum plate 173 and the fulcrum piece 174 is an arm 177 preferably made of flexible material, such as for instance spring steel. At 189 in Figure 23 there is indicated the knife edge positioned at the end of the cutting arm 144.

The modified arms illustrated in Figures 19 and 20

6

may be substituted for the arms shown in Figures 22 and 24 by the simple expedient of securing any of the desired arms to the member 128. Obviously all of the arms must be of uniform construction, so that either arms 129 must be used throughout or arms 177 must be used throughout.

Throughout the description, the letter H refers to a strand of continuous, simulated hair, and Ha refers to the portion of hair which has been cut from the continuous strand of hair.

The manner of attaching the modified wiper to the main drive shaft is identical to the manner in which the disc wiper is attached, therefore no further explanation thereof is made in connection with the modification. It is also apparent that member 128 may be made circular in cross-section instead of hexagon. If a circular member is used, the arms are affixed thereto radially at equal distances from each other.

Figure 25 illustrates a segment of the scalp of a doll, referred to by the numeral 200, showing simulated hair in chain-stitch formation, as at 201.

Continuous hair is rooted in the interior of the hollow head of a doll by the use of the attachments of the present invention in the following manner:

The scalp 102 which is to be worked upon is placed upon the horizontal upper part of post 101 as is shown in Figure 8. The mechanism of the character herein referred to is provided with foot operated means to lower post 101 somewhat so as to increase the space between 101 and 105. Release of pressure upon the foot pedal will return the post to the position illustrated in the drawing. Since this means is conventional, no details of its operation are illustrated or described in detail. For the present purpose it is believed to be sufficient to say that scalp 102 of the doll's head can easily and readily be placed into the position illustrated in Figure 8. Continuous hair H from a spool placed either adjacent disc 37 as illustrated, or atop the head of the mechanism conventionally is now placed in engagement with one of the sets of gripping elements on disc 37. This is done manually by entering the strand of hair between the group of gripping elements and the knife arm and plate 48 nearest the spool at the time of operation. The inward movement of the hair will be limited by the provision of stops 47 against which the hair rests. The mechanism will now be activated in the conventional manner, causing sprocket 80 to rotate, which through chain 76 will cause the rotation of sprocket 77. This will cause the rotation of sprocket 75 mounted on the same shaft as sprocket 77, which in turn will cause the rotation of sprocket 73 through chain 74. Gear 71 at the other end of shaft 70 will rotate and with it gear 72 in mesh with gear 71, at the lower end of shaft 38, the other end of which has disc 37 mounted thereon, thus causing the rotation of the said disc 37. It will be apparent from the relative size of the several sprockets, that disc 37 will complete one revolution to 6 vertically reciprocating movements of the hooked needle 99, since disc 37 is provided with six slots. If the number of slots 43 is altered, the size of the sprockets must obviously be altered correspondingly.

Now disc 37 will rotate in a clock-wise direction as here illustrated, although the direction of rotation may be reversed if desired. The group of gripping elements illustrated at A have had the hair gripped by them released since the follower gripper arm 46 has dropped off track 56 at 86, causing arm 46 to pivot backward, releasing the hair engaged near the tip of arm 46 of that group. At that point, lead arm 45 of group B drops off its track 55 at 85, releasing the hair gripped thereby in the manner just described. At that point, knife arm 44 tilts forward through the action of cam 88, cutting the hair. The timing of the mechanism is such that, at the moment the hair is cut, as at Ha, the vertically reciprocating needle will have pierced the scalp during its upward stroke,

will have completed its upward stroke, the hooked end of the needle will be in position to engage the cut strand of hair substantially midway of its length and draw it downwardly beneath the scalp, and it will be retained through the continuously interlocking action of the lock stitch mechanism. Follower gripper arm 46 of group B will still grip its end of hair, until it reaches the position of group A where it will drop off releasing the hair thereunder, for the next rooting. The beginning of tracks 55 and 56 is tapered as at 87, so that the arms may be positioned upon the tracks in an obvious manner. Continuous rotation of the disc will brush aside the free ends of rooted hair, so that the needle cannot engage the free ends of rooted hair. The guides 103 and the grooves 104 on member 105 of presser foot 96 make it possible for the operator to guide the scalp during the process of rooting so that the operator visually follows the course the stitches are taking.

Figure 1 of the drawings shows that the hair H when engaged by the several groups of grippers, so stretches across the outer edge of each slot, that it is positioned behind the needle. The hair must be moved forward to the center of the slot, so that the needle may engage it. The pusher illustrated in Figure 13 achieves this purpose. The pusher, which performs a rocking motion is so synchronized and mounted to the main drive shaft of the mechanism, that it will move forward when the needle goes up, and backward when the needle goes down. As it moves forward over each successive slot, the cut hair Ha will enter into slot 123a in the fork 122 until it is stopped by pins 124. When the needle has completed its upward stroke and is about to go down, the pusher will have reached its most forward position. In its downward stroke, the needle will pass through slot 123 and the hook of the needle will carry with it the hair Ha stretched thereacross. The pusher will then move backward and forward again when the needle is about to go up.

The modified rotating member illustrated in Figure 21 and the arms illustrated in Figures 19 and 24 are used in the same manner as the grippers of the principal form. Hair from the continuous strand are engaged between the gripping elements in the manner hereabove described. Cut-outs 137 are provided to retain the hair during the rotation of the member. The hair is released and cut in the same manner as hereabove described, and the pusher will move the cut strand of hair forward as explained.

The attachment hereabove referred to has been shown as being adapted for use in connection with a single needle mechanism, but it can obviously be modified for use in connection with a multi-needle mechanism.

There has thus been shown and described a highly efficient attachment for a chain stitch producing mechanism whereby such mechanism may be converted into a mechanism for cutting strands of predetermined length from a strand of continuous, simulated hair for rooting the cut strands in a doll's scalp and for brushing aside the loose ends of rooted hair. Applicant desires to make it clear that he does not intend to use his attachment exclusively in connection with dolls' scalps, since strands of hair or other strands can be rooted with equal effectiveness beneath other suitable and desirable work-pieces.

The present disclosure is to be regarded as descriptive and illustrative only of the best known embodiment of the present invention and not as limitative or restrictive to the exact details shown, applicant reserving the right to make such changes in the construction of the invention as may come within the scope of the appended claims without thereby departing either from the spirit or the scope of the present invention.

Having thus described the invention, what is claimed as new and desired to secure by Letters Patent is:

1. An attachment for converting a chain-stitch type sewing machine into a machine for cutting strands of pre-

determined length from a continuous strand of simulated hair, for rooting the cut strands successively into a work-piece and for brushing aside the loose ends of the rooted hair, said sewing machine having a vertically reciprocating needle, a post and a presser foot above the post, said presser foot having a pair of vertically spaced horizontal arms; said attachment comprising a disc adapted to be rotatably mounted between the horizontal arms of the presser foot, means on said disc for gripping a strand of continuous hair and for carrying the gripped strand of hair into alignment with said needle, means for releasing the gripped hair when the hair is disposed over the needle, means for cutting a strand of predetermined length from said continuous strand of hair when said strand of predetermined length is over the needle, and means on said disc for brushing aside the free ends of rooted hair.

2. An attachment for converting a chain-stitch type sewing machine into a machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a work-piece and for brushing aside the loose ends of the rooted hair, said sewing machine having a vertically reciprocating needle and a post; said attachment comprising a disc adapted to be rotatably mounted above said post, means on said disc for gripping a strand of continuous hair and for carrying the gripped strand of hair into alignment with said needle, means for releasing the gripped hair when the hair is disposed over the needle, means for cutting a strand of predetermined length from said continuous strand of hair when said strand of predetermined length is over the needle, and means on said disc for brushing aside the free ends of rooted hair.

3. An attachment for converting a chain-stitch type sewing machine into a machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a work-piece and for brushing aside the loose ends of the rooted hair, said sewing machine having a vertically reciprocating needle and a post, said attachment comprising a wiper adapted to be rotatably mounted above said post so that it engages said loose ends of rooted hair for brushing said loose ends away from the needle, means on said wiper for gripping a strand of continuous hair and for carrying the gripped strand of hair into alignment with said needle, means for releasing the gripped hair when the hair is disposed over the needle, and means for cutting a strand of predetermined length from said continuous strand of hair when said strand of predetermined length is over the needle.

4. An attachment for converting a chain-stitch type sewing machine into a machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a work-piece and for brushing aside the loose ends of the rooted hair, said sewing machine having a vertically reciprocating needle and a post; said attachment comprising a disc adapted to be rotatably mounted above said post, a plurality of groups of gripping elements operatively mounted on said disc, said groups of gripping elements being circumferentially spaced from one another and each group including a leading and a following gripper element movable toward and away from said disc for gripping and releasing said strand of simulated hair, respectively, and a plurality of cutting means, one for each group of gripper elements, disposed between their associated leading and following gripper elements and adapted to move toward and away from said disc for cutting strands of predetermined length from said continuous strand.

5. An attachment for converting a chain-stitch type sewing machine into a machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a work-piece and for brushing aside the loose ends of the rooted hair, said sewing machine having a vertically reciprocating needle and a post; said attachment comprising a disc

adapted to be rotatably mounted above said post, said disc being provided with a plurality of circumferentially extending and circumferentially spaced slots through which the needle may pass, a plurality of groups of gripper elements, each of said groups of gripper elements comprising a leading and a following radially extending gripper element both disposed between two adjacent slots and being both pivotally mounted on said disc intermediate their two ends for pivotal movement toward and away from said disc for gripping and releasing, respectively, said strand of simulated hair, and a plurality of cutting arms, one for each group of gripper elements, each of said cutting arms being disposed between its associated gripper elements and being operatively pivotally mounted on said disc for movement toward and away from said disc for cutting said strand of simulated hair, and means for imparting pivotal movement to said gripper elements and said cutter arms in timed relation.

6. An attachment for converting a chain-stitch type sewing machine into a machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a workpiece and for brushing aside the loose ends of the rooted hair, said sewing machine having a vertically reciprocating needle and a post; said attachment comprising a disc adapted to be rotatably mounted above said post, said disc being provided with a plurality of circumferentially extending and circumferentially spaced slots through which the needle may pass, a plurality of groups of gripper elements, each of said groups of gripper elements comprising a leading and a following radially extending gripper element both disposed between two adjacent slots and being both pivotally mounted on said disc intermediate their two ends for pivotal movement toward and away from said disc for gripping and releasing, respectively, said strand of simulated hair, and a plurality of cutting arms, one for each group of gripper elements, each of said cutting arms being disposed between its associated gripper elements and being operatively pivotally mounted on said disc for movement toward and away from said disc for cutting said strand of simulated hair, and means for imparting pivotal movement to said gripper elements and said cutter arms in timed relation, said last mentioned means being adapted to move each of said leading gripper elements away from said disc as each of said leading gripper elements approaches said needle and to move each of said leading gripper elements toward said disc when each of said leading gripper elements moves a predetermined distance away from said needle, and to move each of said trailing gripper elements away from said disc as each of said trailing gripper elements moves away from said needle and to move each of said trailing gripper elements toward said disc as each of said trailing gripper elements moves said predetermined distance away from said needle, and to move each of said cutting members toward said disc as each of said cutting members approaches said needle and to move each of said cutting members away from said disc before each of said cutting members has moved said predetermined distance away from said needle.

7. An attachment for converting a chain-stitch type sewing machine into a mechanism for rooting hair into a doll's scalp, the chain-stitch type sewing machine including a post comprising an upright having a rectangularly turned upper end adapted to support the scalp, the rectangularly turned upper end of the post having an opening therein, a vertically reciprocating hooked needle passing partly through the opening in the rectangularly turned upper end of the post to pierce the scalp during the upward stroke of the needle, a presser foot above and in alignment with the needle, the presser foot having two horizontal bars and a vertical bar by which the horizontal bars are joined edgewise, a receptacle adapted to carry a continuous strand of simulated hair from which successive segments are adapted to be engaged by the hooked

end of the needle at the beginning of its downward stroke, the needle being adapted to draw segments of hair through the pierced openings in the scalp during the downward stroke of the needle to stitch the hair securely against the underside of the scalp; said attachment comprising a disc, said disc being adapted to be rotatably mounted in a horizontal plane between the horizontal arms of the presser foot, means on said disc adapted to grip the strand of continuous hair and carry the gripped strand of hair into alignment with the needle, means carried by the disc adapted to release the gripped hair above the needle, means on the disc adapted to cut that segment of hair which is above the needle so that the said segment of hair may be engaged by the needle to be drawn downwardly through the scalp thereby, and means on the disc for brushing aside the free ends of the hair.

8. A machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a workpiece and for brushing aside the loose ends of the rooted hair, said machine comprising a vertically reciprocating needle, a post and a presser foot above the post, said presser foot having a pair of vertically spaced horizontal arms, a disc rotatably mounted between the horizontal arms of the presser foot, means on said disc for gripping a strand of continuous hair and for carrying the gripped strand of hair into alignment with said needle, means for releasing the gripped hair when the hair is disposed over the needle means for cutting a strand of predetermined length from said continuous strand of hair when said strand of predetermined length is over the needle, and means on said disc for brushing aside the free ends of rooted hair.

9. A machine for cutting strands of predetermined length from a continuous strand of simulated hair, for rooting the cut strands successively into a workpiece and for brushing aside the loose ends of the rooted hair, said machine comprising a vertically reciprocating needle, a post, a horizontal disc rotatably mounted above said post, means on said disc for gripping a strand of continuous hair and for carrying the gripped strand of hair into alignment with said needle, means for releasing the gripped hair when the hair is disposed over the needle, means for cutting a strand of predetermined length from said continuous strand of hair when said strand of predetermined length is over the needle, and means on said disc for brushing aside the free ends of rooted hair.

10. A machine for rooting hair into a doll's scalp, comprising a vertically extending post having a rectangularly turned upper end adapted to support the scalp, the rectangularly turned upper end of the post having an opening therein, a vertically reciprocating hooked needle passing partly through the opening in the rectangularly turned upper end of the post to pierce the scalp during the upward stroke of the needle, a presser foot above and in alignment with the needle, the presser foot having two horizontal bars and a vertical bar by which the horizontal bars are joined edgewise, a receptacle adapted to carry a continuous strand of simulated hair from which successive segments are adapted to be engaged by the hooked end of the needle at the beginning of its downward stroke, the needle being adapted to draw segments of hair through the pierced openings in the scalp during the downward stroke of the needle to stitch the hair securely against the underside of the scalp, a horizontal disc rotatably mounted between the horizontal arms of the presser foot, means on said disc adapted to grip the strand of continuous hair and carry the gripped strand of hair into alignment with the needle, means carried by the disc adapted to release the gripped hair above the needle, means on the disc adapted to cut that segment of hair which is above the needle so that the said segment of hair may be engaged by the needle to be drawn downwardly through the scalp thereby, and means on the disc for brushing aside the free ends of the hair.

11. A machine for rooting hair into a doll's scalp, comprising a vertically extending post having a rectangularly turned upper end adapted to support the scalp, the rectangularly turned upper end of the post having an opening therein, a vertically reciprocating hooked needle passing partly through the opening in the rectangularly turned upper end of the post to pierce the scalp during the upward stroke of the needle, a presser foot above and in alignment with the needle, the presser foot having two horizontal bars and a vertical bar by which the horizontal bars are joined edgewise, a receptacle adapted to carry a continuous strand of simulated hair from which successive segments are adapted to be engaged by the hooked end of the needle at the beginning of its downward stroke, the needle being adapted to draw segments of hair through the pierced openings in the scalp during the downward stroke of the needle to stitch the hair securely against the underside of the scalp, a vertically extending shaft, a horizontal disc rotatably mounted on said shaft, said disc having a plurality of circumferentially extending and circumferentially spaced slots movable into and out of registry with said needle, a plurality of pairs of gripper elements extending radially from said vertical shaft to adjacent the circumferential edge of said disc, said elements being operatively pivotally mounted on said disc, each of said pairs of gripper elements being disposed between two adjacent slots in said disc for releasably holding said continuous strand, one of said gripper elements from each pair being a leading element and the other of said gripper elements from each pair being a following element, a plurality of cutter members for cutting said continuous strand into a plurality of strands of predetermined length, one of said cutter members for each pair of gripper elements, each of said cutter members extending radially from said vertical shaft to adjacent the circumferential edge of said disc between its associated gripper elements, each of said cutter members being operatively pivotally mounted on said disc, means for rotating said disc about said vertical shaft, cam

means on said vertical shaft in engagement with said gripper elements for pivotally moving said gripper elements into and out of engagement with said strand to grip and release, respectively, said strand, and other cam means on said vertical shaft in engagement with said cutter members for pivotally moving said cutter member toward and away from said disc for cutting said continuous strand into strands of predetermined length, said first mentioned cam means moving each of said leading gripper elements away from said disc as each of said leading gripper elements approaches said needle and moving each of said leading gripper elements toward said disc when each of said leading gripper elements moves a predetermined distance away from said needle, and moving each of said trailing gripper elements away from said disc as each of said trailing gripper elements moves away from said needle and moving each of said trailing gripper elements toward said disc as each of said trailing gripper elements moves said predetermined distance away from said needle, and said other cam means moving each of said cutting members toward said disc as each of said cutting members approaches said needle and moving each of said cutting members away from said disc before each of said cutting members has moved said predetermined distance away from said needle.

References Cited in the file of this patent

UNITED STATES PATENTS

30	1,000,525	Kubelka	Aug. 15, 1911
	1,090,198	Butler	Mar. 17, 1914
	2,224,866	Gladish	Dec. 17, 1940
	2,253,635	Mann	Aug. 26, 1941
	2,626,619	Sievers	Jan. 27, 1953
35	2,667,879	Mann et al.	Feb. 2, 1954
	2,670,570	Gnaizda	Mar. 2, 1954
	2,686,305	Hall	Aug. 10, 1954
	2,698,019	Sotzky	Dec. 28, 1954