Jan. 6, 1925. 1,522,348

M. L. VICTORIUS

LOOPER FOR HOSIERY

Filed Dec. 30, 1922 3 Sheets-Sheet 1

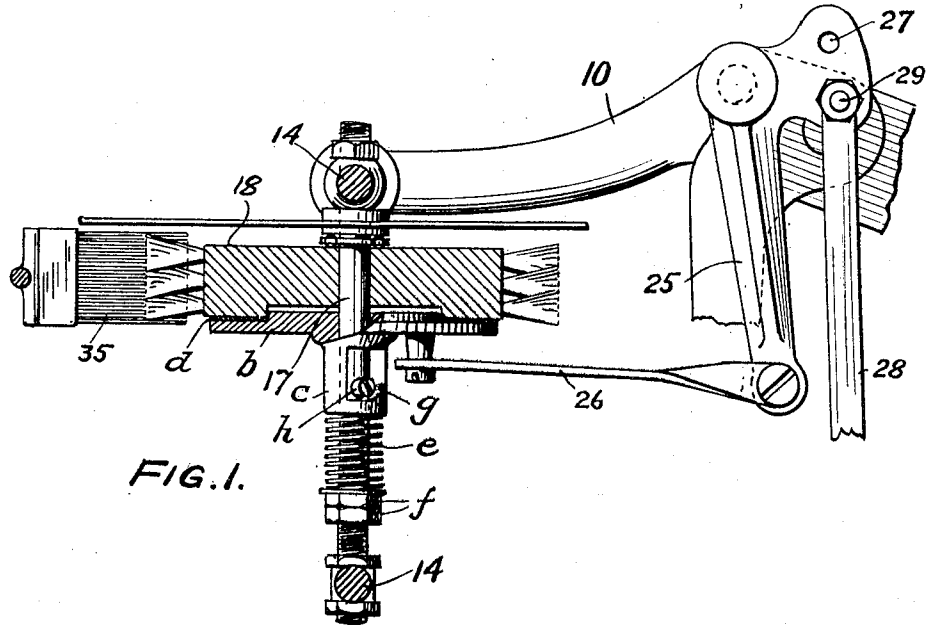


FIG. 1.

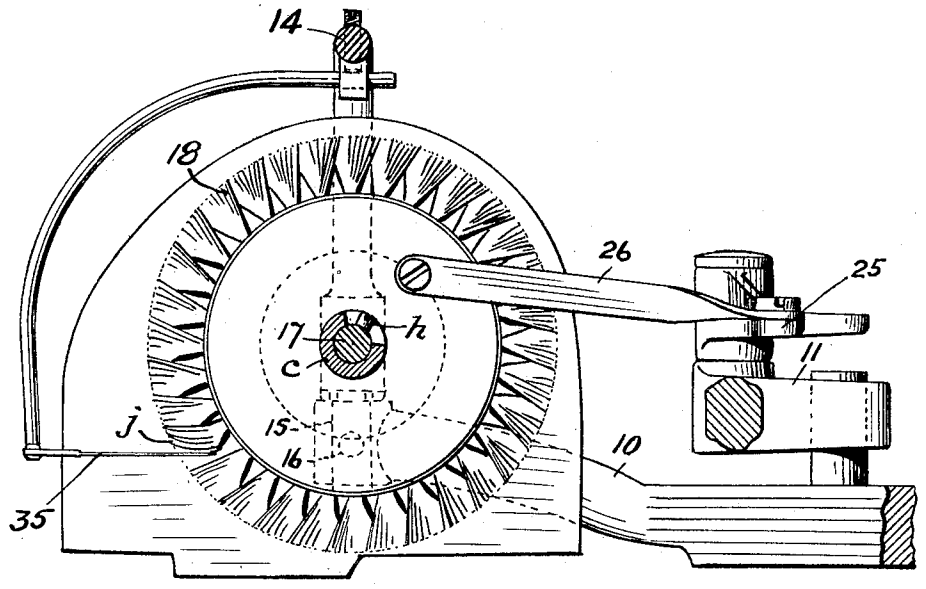


FIG. 2.

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BY

Frank L. Busser

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WITNESS:

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Jan. 6. 1925. 1,522,348

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LOOPER FOR HOSIERY

Filed Dec. 30, 1922 3 Sheets-Sheet 2

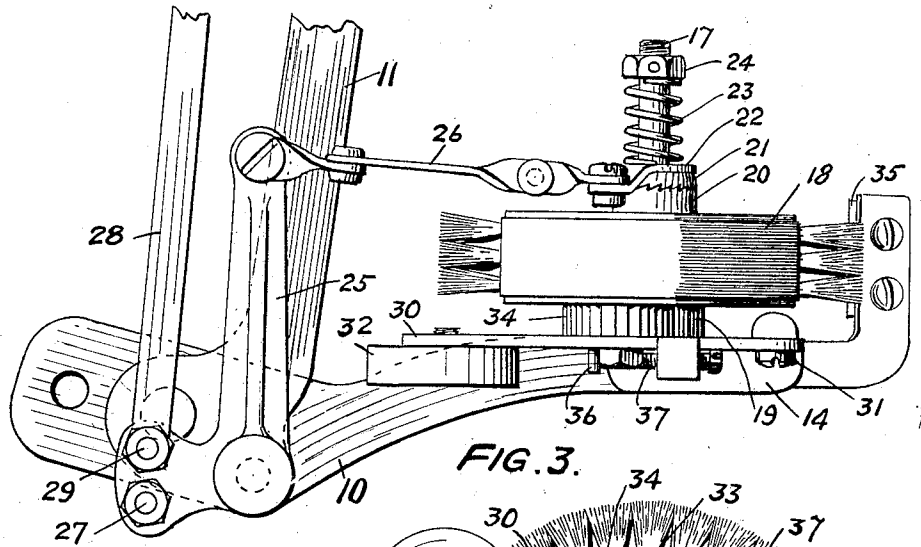


FIG. 3.

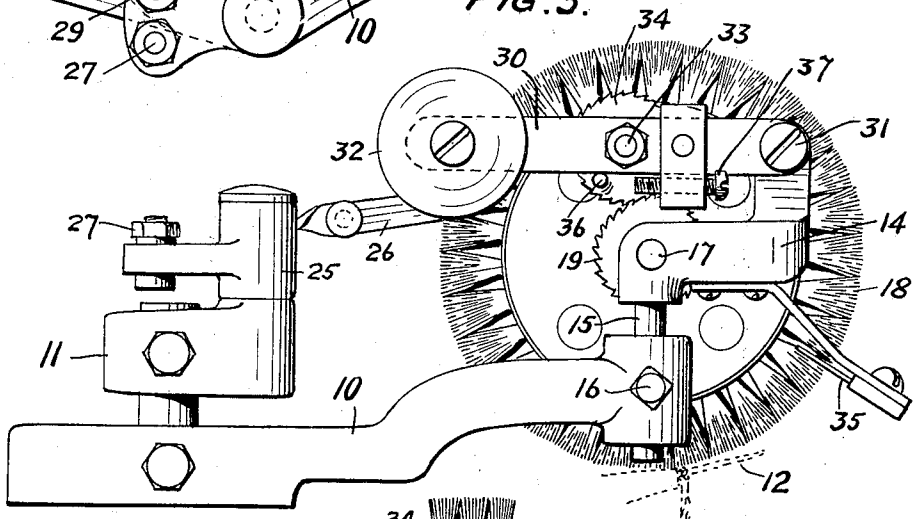


FIG. 4.

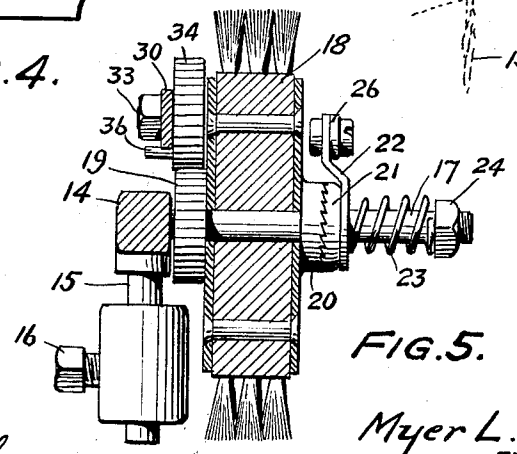


FIG. 5.

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LOOPER FOR HOSIERY

Filed Dec. 30, 1922 3 Sheets-Sheet 3

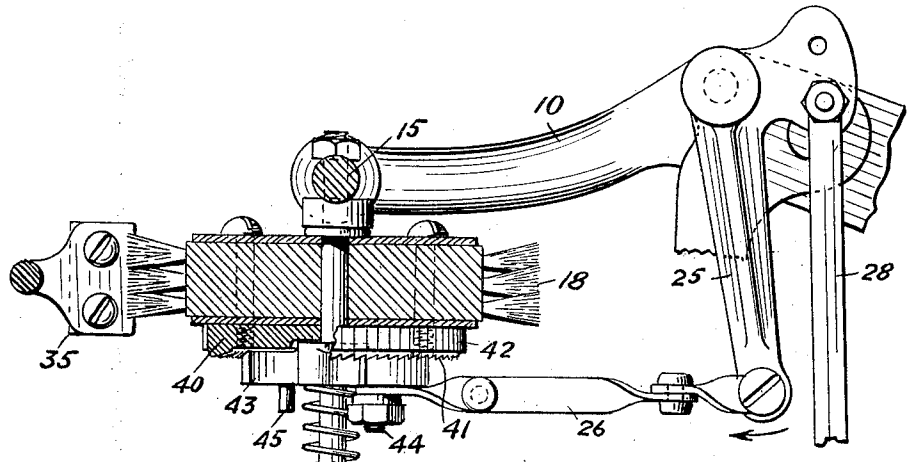


FIG. 6.

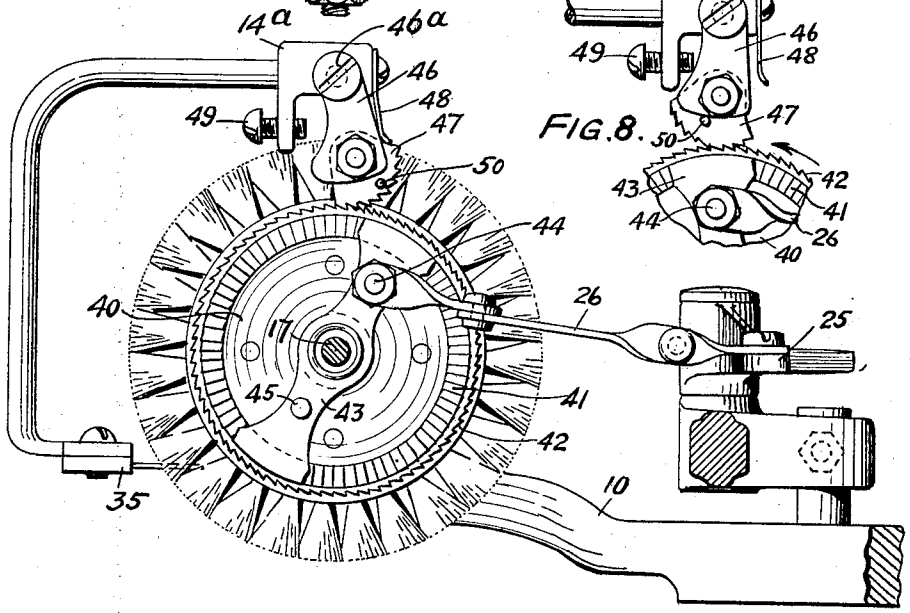


FIG. 7.

FIG. 8.

WITNESS:

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Patented Jan. 6, 1925.

1,522,348

UNITED STATES PATENT OFFICE.

MYER L. VICTORIUS, OF NEW YORK, N. Y.

LOOPER FOR HOSIERY.

Application filed December 30, 1922. Serial No. 609,830.

To all whom it may concern:

Be it known that I, MYER L. VICTORIUS, a citizen of the United States, residing at New York city, county of New York, and State of New York, have invented a new and useful Improvement in Loopers for Hosiery, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to an improvement in loopers for closing the open toe of stockings as they come from the knitting machine.

In the manufacture of hosiery or stockings, and particularly stockings knit on circular machines, the stockings as they come from the machine have an opening at the toe which is closed on what is known as a looper or looping machine. The looper is provided with the disc having a plurality of spaced points extending from the periphery thereof and a sewing attachment. The open toe end of each stocking as it comes from the knitting machine is provided with what is known as a looper round, which is nothing more than superfluous fabric extending beyond the round of loops which are to be looped to each other to close the toe, and which forms a handhold for the operator for positioning the loops on the points of the looping machine. The round of loops which are to be looped to each other are usually somewhat longer than the loops of the other rounds, so as to permit looping without straining the loops, as well as to indicate to the operator the loops which are to be joined to close the toe.

In closing the toe, the operator holds the toe portion of the stocking and places loops of the round to be looped on the looper points, in the usual manner, while grasping the stocking by the looper round and the toe forming portion. The surplus material or looper round is then cut close to the looper points, either by shears connected to the looping machine or by means of hand shears. When the surplus material is cut from the loops on the looper points, there is still retained in the loops on the points thread ends or what might be termed ravelings of the cut loops, and if said loose thread ends are not removed from the loops they would be interlocked with the stitching when the loops on the points are joined to each other and form an irregular welted or heavy seam.

In the earlier loopers, these ravelings were removed by hand, while in the later machines they are removed by means of a circular brush which is oscillated by the looping machine actuating mechanism.

In machines of the later type, the brush is secured in an adjustable manner to an oscillating shaft, and the brush is oscillated within fixed limits to present the same surface thereof to the looper points, and the material supported thereby. This portion of the brush soon becomes clogged with lint or thread ends. When the actuating portion of the brush becomes clogged, the operator releases the brush from the shaft, rotates the brush a slight degree on its shaft, and then secures it in position to present a fresh or clean brush surface to the looper points. After the entire surface of the brush has become clogged, the brush is removed, cleaned or replaced by a clean brush.

When the brushes are adjusted by the operator or the machine fixer to present a clean portion to the looper points, as above described, the brush is not adjusted so that the beginning of the clean portion of the brush is that portion immediately following the clogged portion. In other words, after a brush has been adjusted a complete cycle and is removed for cleaning, it will be found that there are clean brush portions between the clogged portions. This may not appear to be material, but after the brush has been cleaned it will be found that the bristles at those portions which were clogged are shorter than those portions which were not clogged. This unequal length of bristles in the different portions of the brush was caused by the wearing away of the bristles at the previously clogged portions when brushing the ravelings from the loops on the points, and as some portions of these previously clogged portions were subjected to greater wear than other portions, such worn portions are also of unequal length. When a cleaned brush is placed on the machine, it is difficult to adjust the brush to give the proper brushing action to clear the ravelings as the bristles vary in length, so that great care must be exercised in adjusting the brush.

The object of my invention is to so mount and actuate the brush for removing the cut

ends or portions of the cut loops as to automatically and continuously clear the brush of lint and thread ends so that a substantially clean brushing surface is always presented to the points without changing the general construction of the brush actuating mechanism.

A further object of my invention is to so actuate the brush that the bristles around the entire brush will be subjected to the same wear, so that the bristles will be maintained at substantially the same length over the entire circumference of the brush. This is accomplished by causing the brush to move a greater distance in one direction than the other so that as the brush is oscillated it is advanced step by step in relation to a lint-removing comb properly positioned relative to the brush to continuously comb the lint therefrom, and to present a cleaned portion of the brush each oscillation.

The precise nature of my invention will best be understood by reference to the accompanying drawings, which will now be described, it being premised, however, that various changes may be made in the details of construction without departing from the spirit and scope of my invention as defined in the appended claims.

Fig. 1 is a plan view, partially in section, of one form of brush actuating mechanism constructed in accordance with my invention.

Fig. 2 is a side elevation of Fig. 1, partially in section.

Fig. 3 is a plan view of another form of brush actuating mechanism constructed in accordance with my invention.

Fig. 4 is a side elevation thereof.

Fig. 5 is a sectional view through the brush.

Fig. 6 is a sectional plan view of still another form.

Fig. 7 is a side elevation of the mechanism shown in Fig. 6.

Fig. 8 is a detail view of the stop mechanism shown in Fig. 7.

In my preferred construction shown in Figs. 1 and 2, the reference character 10 designates the supporting bracket for the brush mechanism and 11 an adjustable bracket carried by the first bracket for supporting the shear mechanism (not shown) for shearing the superfluous material or looper round from the loops after the stocking has been positioned on the points of the looping machine.

12 are looper points indicated in dotted lines on Fig. 4, and 13 is the fabric hanging therefrom by the loops, which are to be joined to each other on the looping machine.

Adjustably mounted on bracket 10 is a U-shaped bracket 14 having a cylindrical stem 15 within a bored opening in bracket 10, and which is adjustably secured thereto by a set screw 16. Secured at both ends within bosses on the legs of the U-shaped bracket 14 is a shaft 17, and mounted for movement on the shaft 17 is the raveling removing brush 18.

Mounted for oscillation on shaft 17 is a disc *b* having a hub *c*. *d* is a ring of friction material, such as leather, secured to disc *b* and which is normally held in driving relation with one side of the body of brush 18 by a compression spring *e* on shaft 17. This spring is interposed between hub *c* and adjusting nuts *f* on a threaded portion of shaft 17, and which nuts are arranged to adjust the pressure of the spring and thereby adjust the friction between the disc *b* and brush 18. The hub *c* is provided with a cut-away portion having a cam surface *g* therein, which is arranged to coact with a fixed pin *h*, extending from shaft 17 into the cut-away portion. The cam surface and pin are arranged to withdraw the disc *b* from the brush for the purpose hereinafter described.

Pivotally mounted on bracket 11 is a bell crank 25, and 26 is a link having universal joints and is connected to the long arm of the bell crank 25 and disc *b*. The short arm of the bell crank is connected to the looper actuating mechanism by means of a link which is connected to the short arm of the bell crank at 27, and 28 is a link connected to the short arm of the bell crank by a screw 29. The link 28 is arranged to actuate the shears for trimming the surplus material from the loops on the looper points. 35 is a brush cleaning comb adjustably supported from bracket 14.

In the operation of the device, the bell crank 25 is continuously oscillated by the looper actuating mechanism connected to the point 27, and the material to be looped is placed on the points in advance of the shears, not shown. As the placed fabric passes the shears, the surplus material or looper round is cut from above the loops on the points. The points with the loops thereon and the loose ends hanging thereto are passed under the brush after passing the shears in a step-by-step manner well known in the art. The brush is oscillated through the medium of link 26 to brush the loose threads from the loops on the points. The pressure of spring *e* is adjusted so as to cause the brush 18 to move with disc *b* when the disc and brush are in engagement with each other. As the device is illustrated in Fig. 2, the brush and disc are being moved counter-clockwise and will be so moved until the cam surface *g* rides over pin *h* for a short distance. As cam surface *g* rides over pin *h*, disc *b* will be withdrawn from brush 18. As brush 18 is moved through comb 35, the teeth of which are very close to each other, the bristles of the brush will be de-

flected as shown at *j*, and as soon as disc *b* is drawn from the body of brush 18, the tension of the bristles against the comb at *j* will cause the brush to move clockwise a short distance while the disc is completing its counterclockwise movement.

In the clockwise movement of disc *b*, it will be forced against brush 18 after the cam surface *g* leaves pin *h* and will move the brush during its full return stroke (clockwise) after engagement of the brush by the disc. It will therefore be seen that for each reciprocation of the mechanism, the brush will be moved a slightly greater distance in a clockwise direction than in the other direction, and thereby present at least a portion of clean brushing surface to the fabric. As the brush is shifted clockwise in a step-by-step manner about the same distance for each reciprocation, the brush is not only continuously cleaned, but is actuated in such a manner that all of the bristles will be subjected to substantially the same wear, so that the length of the bristles will all be maintained substantially the same over the entire brush regardless of the wear to which the brush is subjected. As all of the bristles are subjected to substantially the same wear, it will readily be understood that the brush can readily be adjusted toward the fabric to compensate for such wear by adjusting stem 15 in bracket 10.

In the construction shown in Figs. 3–5, the reference character 10 designates the supporting bracket for the brush mechanism and 11 the adjustable bracket for the shear mechanism.

Adjustably mounted on the bracket 10 is a bracket 14 having a cylindrical stem 15 within a bored opening in the bracket 10 and which is adjustably secured thereto by a set screw 16.

Secured to the bracket 14 is a shaft 17 and loosely mounted on said shaft is a brush 18 having a central portion formed of wood and which is clamped between two metal discs. Connected to one of the discs is a wheel 19 having radially disposed ratchet teeth, and 20 is a similar wheel having laterally extending teeth connected to the other disc. The wheel 20 is engaged by a similar wheel 21 on the shaft 17 and is provided with an actuating lever 22 for the purpose hereinafter described. The wheel 21 is held in engagement with wheel 20 by means of a spring 23 surrounding shaft 17 and interposed between a nut 24 and said wheel 21. The tension of the spring 23 may be varied by adjusting the nut 24 along shaft 17.

Pivotally mounted on bracket 11 is a bell crank 25, and 26 is a link having universal joints and which is connected to the long arm of the bell crank and lever 22 of wheel 21. The short arm of this bell crank lever 25 is connected to the looper actuating mechanism by means of a screw 27 whereby the bell crank is oscillated, and 28 is a link connected to the bell crank lever by a screw 29 and is arranged to actuate the shear for trimming the surplus material from the loops of the fabric on the points 12 above the fabric 13 suspended from the points.

30 is a lever pivotally connected to the bracket 14 at 31, and which carries a weight 32 at its outer end. Rotatably mounted on a stud screw 33 extending laterally from lever 30 is a wheel 34 having ratchet teeth which engage the teeth of wheel 19 on brush 18. Supported from bracket 14 is a comb 35 having teeth which extend between the bristles of the brush 18 and arranged to clean the lint from the brush as the brush is advanced, as hereinafter described.

Extending laterally from wheel 34 and under lever 30 is a pin 36, and 37 is an adjustable stop for the pin 36 carried by a lug on lever 30, and which stop limits the movement of wheel 34 in a counterclockwise direction.

In the operation of the device, the bell crank lever is continuously oscillated by the looper actuating mechanism connected to screw 27, and the material to be looped is placed on the points in advance of the shears not shown. As the placed fabric passes the shears, the surplus material is cut from above the points and the points with the loops thereon and the loose ends hanging thereto are moved under the brush 18 in a step-by-step manner well known in the art. The brush 18 is oscillated through its various connections as hereinafter described and is moved a slightly greater distance in a counterclockwise direction, as viewed in Fig. 4, than it is moved in a clockwise direction, for each complete reciprocation, so that the brush is moved step by step in a counterclockwise direction to remove the loose ends from the loops on the points and to also remove the loose ends from the brush.

Assuming the parts to be in the positions shown in Figs. 3 and 4 and the brush is being moved counterclockwise, all of the parts associated with the brush will move together until pin 36 engages the under side of lever 30. This engagement of pin 36 will arrest the further movement of wheel 34, and wheel 19 will move, for example, the distance of one tooth more than the movement of wheel 34. As the teeth in these wheels 19 and 34 are cut as shown in Fig. 4, wheel 19 can readily move counterclockwise after the movement of wheel 34 is arrested. On the return stroke of bell crank 25, the frictional engagement between wheels 20 and 21 is sufficient to move the brush in a clockwise direction until pin 36 engages stop 37 and thereby arresting the movement of brush 18 and wheels 19 and 34, which now form a positive lock against further clockwise move-

ment of the brush. During the further movement of the bell crank lever for moving the brush in a clockwise direction, the teeth of wheel 21 will slide over teeth of wheel 20 the distance of one tooth so that the clockwise movement of the brush is slightly less than its counterclockwise movement so that the brush is advanced step by step in a counterclockwise direction with relation to the comb 35 and the looper points passing under the brush. If it is desired to increase the advance movement of the brush, it is only necessary to shorten the movement of wheel 34 by adjusting stop 37 to cause a slip of two teeth instead of one as above described.

In Figs. 6–8, I have shown another form in which I have applied the same reference characters for designating similar parts. In this form I also provide two clutches which perform the same functions as the clutches in the other form. In this form, the diameters of the toothed wheels are greater than those in the other form and as the teeth are about the same pitch a greater number of teeth are provided so that a larger number of adjustments can be made between the maximum and minimum advance movement of the brush over its return movement.

The brush 18 is provided with a wheel 40 having side teeth 41 and peripheral teeth 42. The side teeth 41 correspond to the teeth on wheel 20 of the device shown in Figs. 3–5, while the teeth 42 correspond to the teeth on wheel 19 of said device. The teeth 41 are engaged by the oppositely disposed teeth on a clutch member 43, which is oscillated by link 26 connected to either crank pin 44 or 45 on member 43. As these crank pins are different distances from the center of shaft 17, the throw of member 43 may be decreased by connecting the link 26 to pin 45. If desired, an adjustable crank pin may be provided in either device, so that the throw of driving clutch members of either device may be adjusted within predetermined limits.

The adjustable stop mechanism and comb for cleaning the brush in this construction are also supported from bracket 14^a which also supports shaft 17.

The stop mechanism comprises a lever 46 pivoted to bracket 14^a at 46^a, and pivoted to the lower end of lever 46 is a toothed sector 47. The teeth of this sector engage teeth 42 of the wheel carried by the brush 18. 48 is a spring which forms a stop for segment 47 and prevents its movement in a counterclockwise direction beyond a predetermined limit, as shown in Fig. 7, and also returns lever 46 in a clockwise direction to the position shown in said Fig. 7. 49 is an adjustable stop for lever 46 which limits its movement in a clockwise direction.

Assuming the parts in the position shown in Figs. 6 and 7, with link 26 moving to the right to rotate brush 18 clockwise, when the parts are in the position just described, further rotation of segment 47 about its pivotal connection with lever 46 is arrested by the end of spring 48. Lever 46, however, may swing about its axis 46^a in a counterclockwise direction as the brush is rotated clockwise by link 26 and clutch member 43, which now positively drives the brush. During the further clockwise movement of brush 18 from that shown in Fig. 7, teeth 42 will slip over the teeth of sector 47 the distance, for example, of two teeth. On the return movement (to the left) of link 26, the parts will move together as the frictional engagement between clutch member 43 and teeth 41 is sufficient to rotate brush 18 in a counterclockwise direction until pin 50 engages the under side of lever 46 and lever 46 engages stop 49, as shown in Fig. 8. When the position just described is reached, the further movement to the left of link 26 will cause clutch member 43 to slip over the same number of teeth 41 as the number of teeth 42 slipped over the teeth of segment 47 on the previous throw of link 26. So that in this form the advance movement of brush 18 is greater than its return movement whereby the brush is advanced step by step, while the extent of the advance movement over the return movement may be varied by adjusting stop 49.

The advantages of my invention result from the provision of a thread end removing brush for a looping machine which is oscillated in a continuous manner when the looper is in operation and in which its movement in one direction is greater than in the other direction, together with a cleaner therefor, whereby the brush is slowly rotated in the direction of its greatest movement in a step-by-step manner, through the cleaner, so that the brush is cleaned continuously in a step-by-step manner, thus providing means for automatically cleaning the brush, as well as providing means for subjecting all portions of the brush to substantially the same wear so that the bristles of all portions of the brush will be of substantially the same length regardless of wear.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. A thread end removing device for looping machines and the like, comprising in combination a brush, mechanism for oscillating the brush and means for rotating the brush.

2. A thread end removing device for looping machines and the like, comprising in combination a brush, means for cleaning the brush, mechanism for oscillating the brush and means for rotating the brush with relation to the cleaning means.

3. A thread end removing device for looping machines, and the like, comprising in combination a brush, means for cleaning the brush, mechanism for oscillating the brush and means for advancing the brush peripherally in relation to the cleaning means in a step by step manner.

4. A thread end removing device for looping machines and the like, comprising in combination a brush, means for cleaning the brush, mechanism for oscillating the brush, and means whereby the brush is moved a greater peripheral distance in one direction than in the other.

5. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb, mechanism for oscillating the brush, and means for rotating the brush in relation to the comb in a step-by-step manner.

6. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb, mechanism for oscillating the brush, and means for advancing the brush in a step by step manner with relation to the comb.

7. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb, mechanism for oscillating the brush, and means whereby the brush is moved a greater distance in one direction than in the other.

8. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb in engagement with the bristles of the brush, mechanism for oscillating the brush including a clutch, and means to release the clutch for a portion of the movement of the mechanism in one direction.

9. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb in engagement with the bristles of the brush, mechanism for oscillating the brush, a clutch in the oscillating mechanism, and clutch releasing means for releasing the clutch, to render the brush independent of the oscillating mechanism.

10. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb in engagement with the bristles of the brush, mechanism for oscillating the brush, a clutch in the oscillating mechanism, and clutch releasing means for releasing the clutch near the end of the movement in one direction of said oscillating mechanism to permit the spring of the bristles in engagement with the comb to move the brush in a reverse direction to that of the movement of the oscillating mechanism to cause the brush to be advanced peripherally in a step by step manner with relation to the comb during its oscillation.

11. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb in engagement with the bristles of the brush, mechanism for oscillating the brush, a clutch in the oscillating mechanism, a spring for retaining the clutch members in engagement with each other, and cam means for separating the clutch members during a portion of the movement of the oscillating mechanism in one direction.

12. A thread end removing device for looping machines and the like, comprising in combination a brush, a cleaning comb in engagement with the bristles of the brush, mechanism for oscillating the brush, a clutch in the oscillating mechanism, means for releasing the clutch during a part of the movement of the oscillating mechanism in one direction, a spring for retaining the clutch in engagement, and means for adjusting the clutch releasing means to vary the point of release.

13. A thread end removing device for looping machines and the like, comprising in combination a shaft, a brush turnably mounted on the shaft, a disc provided with a hub turnably mounted on the shaft, means to oscillate the disc, a spring adapted to press the disc into contact with the brush and cause it to oscillate, a cam surface in the hub of the disc and a pin in the shaft adapted in the oscillation of the disc to contact with the cam surface and cause the disc to be withdrawn from contact with the brush.

14. A thread end removing device for looping machines and the like, comprising in combination a shaft, a brush, turnably mounted on the shaft, a disc provided with a hub turnably mounted on the shaft, means to oscillate the disc, a spring adapted to press the disc into contact with the brush and cause it to oscillate, means to vary the tension of the spring, a cam surface formed in the hub of the disc and a pin in the shaft adapted in the oscillation of the disc in one direction to contact with the cam surface and cause the disc to be withdrawn from contact with the brush against the action of the spring, and means for varying the relative positions of the pin and cam surface..

In testimony of which invention, I have hereunto set my hand, at New York, N. Y., on this 27th day of December, 1922.

MYER L. VICTORIUS.