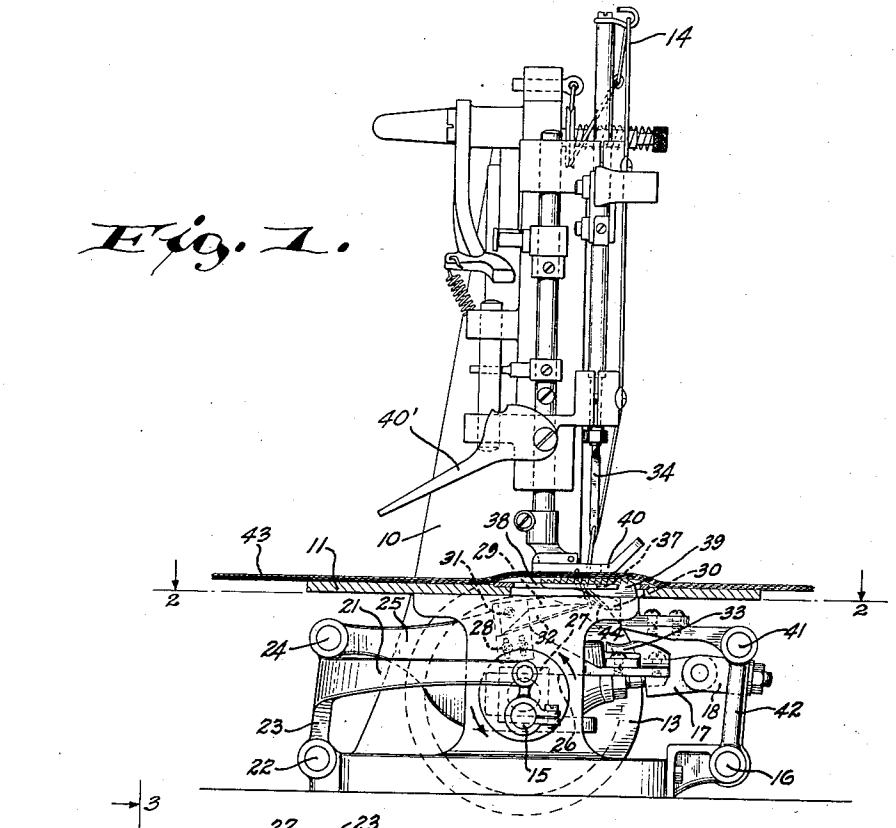
Nov. 20, 1934. W. F. SCHMIEDEL 1,981,252

TUFTING ATTACHMENT FOR SEWING MACHINES

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Fig. 1.



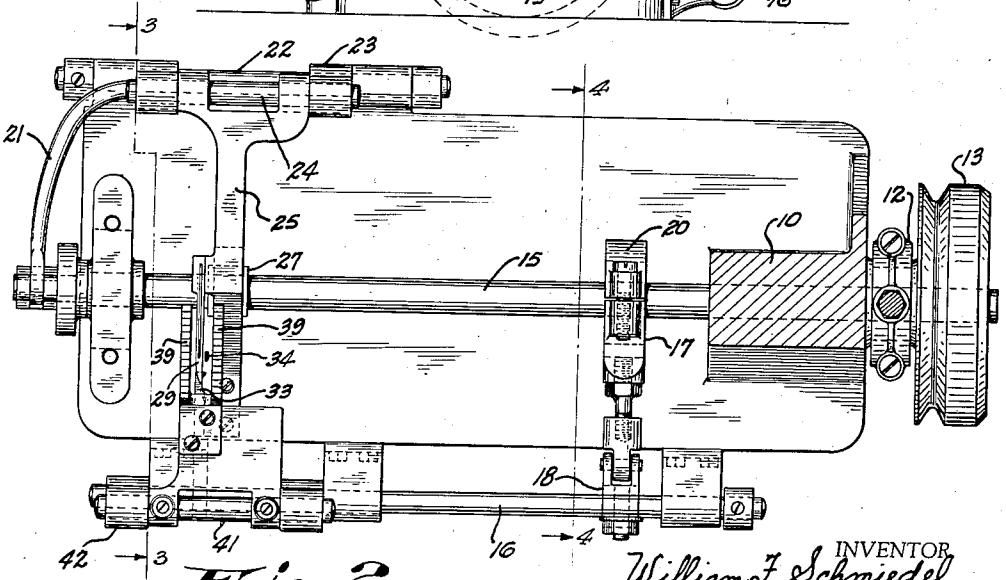


Fig. 2.

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Fig. 3.

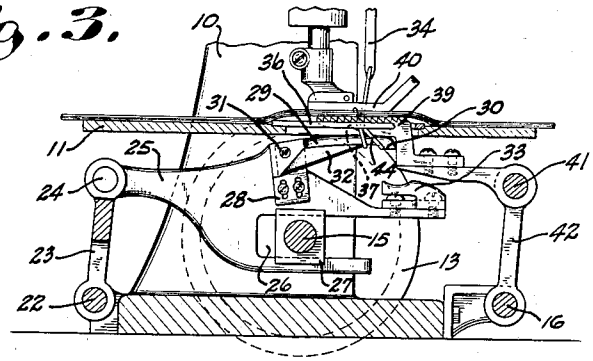
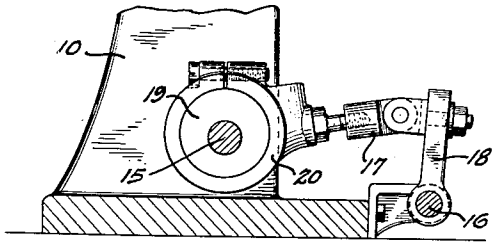


Fig. 4.



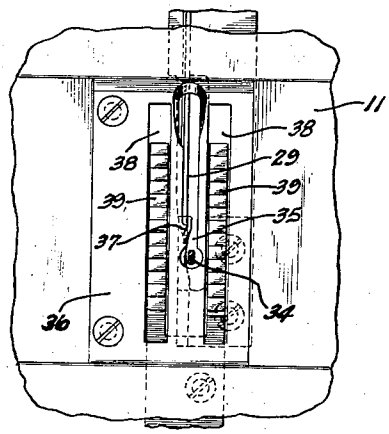


Fig. 5.

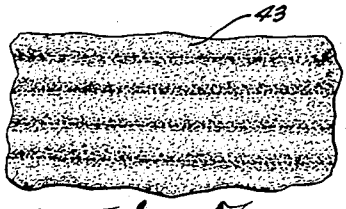


Fig. 7.

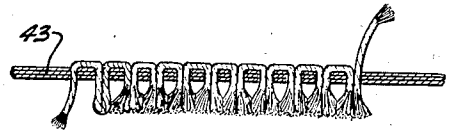


Fig. 6.

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UNITED STATES PATENT OFFICE

1,981,252

TUFTING ATTACHMENT FOR SEWING MACHINES

William F. Schmiedel, Oshkosh, Wis., assignor to Deltox Rug Company, Oshkosh, Wis., a corporation of Wisconsin

Application September 18, 1933, Serial No. 689,926

11 Claims. (Cl. 112—79)

This invention relates to improvements in tufting attachments for sewing machines.

It is one of the objects of the present invention to provide a tufting attachment for sewing machines which is very simple and employs a minimum number of parts, and in which the strand looping member and cutting means are combined.

A further object of the invention is to provide a tufting attachment for sewing machines wherein the strand loop cutting means is arranged to sever the loops with a long drawing cutting motion instead of a chopping motion whereby higher speed of operation is attained and wear on one point of the cutter is eliminated.

A further object of the invention is to provide an attachment of the class described wherein a previously engaged loop on the looper is severed by a reciprocation of the looper in one direction and at the same time another loop is being engaged and formed so that upon each complete operation one loop is severed and one other loop is formed and held.

A further object of the invention is to provide a tufting attachment for sewing machines having a cutter replaceably carried directly by the looper, permitting easy removal of the cutter for sharpening or for replacement.

A further object of the invention is to provide a tufting attachment for sewing machines having a vertically adjustable combination looper and cutter whereby the lengths of the loops to be formed may be easily controlled.

A further object of the invention is to provide an attachment of the class described wherein the work supporting plate is formed with an elongated serrated slot for the purpose of engaging the outwardly extending length of yarn and holding it tightly in relation to the looper during certain portions of the reciprocation of the needle and looper.

A further object of the invention is to provide a tufting attachment for sewing machines which is of very simple construction, which will operate at an unusually high rate of speed, which is strong and durable and inexpensive, and which is well adapted for the purposes set forth.

With the above and other objects in view the invention consists of the improved tufting attachment for sewing machines, and its parts and combinations as set forth in the claims, and all equivalents thereof.

In the accompanying drawings in which the same reference characters indicate the same parts in all of the views:

Fig. 1 is an end elevation of a sewing machine showing the improved tufting mechanism incorporated therein, the base plate of the machine being in section;

Fig. 2 is a horizontal sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a transverse vertical sectional view taken on line 3—3 of Fig. 2;

Fig. 4 is another transverse vertical sectional view taken on line 4—4 of Fig. 2;

Fig. 5 is a fragmentary plan view of the work supporting plate with the needle shown in section;

Fig. 6 is a sectional detail view of a piece of material illustrating the formation of the pile members, one of the strand loops being shown before severance; and

Fig. 7 is a top view of a fragmentary portion of a completed rug.

Referring now more particularly to the drawings it will appear that a sewing machine head is indicated generally by the numeral 10 and said head includes a base portion 11 having extended therefrom an arm 12 equipped with the usual drive shaft 15 and pulley 13 journaled thereon. The thread or strand feeding means 14 and the fabric feed control mechanism 40' are of usual construction, so will not be described in detail. Motion is transmitted from the drive shaft 15 to a forward rock shaft 16 through eccentrically mounted discs 19 and 20, a pitman 17, and connecting link 18. A motion translating mechanism 21, between the end of the drive shaft 15 and a rear rock shaft 22, causes rocking motion of said latter rock shaft.

The rear rock shaft 22 carries a bifurcated frame 23 having a rod 24 mounted in its upper end portions. The inner end portion of a looper frame 25 is pivotally mounted on said rod. The free end portion of the looper frame 25 is enlarged and the lower outer portion thereof is formed with an outwardly opening slot 26 slidably engaging a block 27 in which the drive shaft 15 turns, whereby said looper frame is slidably supported.

The upper outer portion of the looper frame 25 vertically adjustably carries a plate 28 and projecting substantially right angularly from the upper portion of the plate is a looper 29 having a shoulder 30 at its outer end portion. There is removably held to the plate 28 and looper 29, by means of a screw 31, a cutter 32, whose cutting edge is disposed at an angle with respect to the edge of the looper. The cutter terminates short of the shouldered portion of the

looper but is arranged to form an angularly disposed extension of the effective edge of the looper. Formed on the looper frame 25, below the looper, is a needle guide 33.

As shown best in Fig. 2 the inner face of the looper 29 is substantially straight and flat for its horizontal reciprocation alongside of the needle 34 which reciprocates vertically through a needle slot 35 provided in a work supporting plate 36 forming part of the base portion 11. The needle slot 35 extends parallel to the reciprocal movement of the looper frame 25 and is positioned thereabove. An important feature of the invention resides in the formation, along one side of the needle slot 35, of notches or serrations 37 for engaging an upward extension of the thread or yarn, as will later be described more in detail. On both sides of the needle slot 35 the plate 36 is formed with elongated parallel slots 38 through which serrated work feeding plates 39 project, which plates cooperate with a conventional fabric feeding foot 40 for intermittently advancing the fabric as the sewing progresses, in the usual manner. The plates 39 are carried by a rod 41 in the upper end of a rock arm 42, the rock arm being mounted on and rocked by the forward rock shaft 16.

A piece of fabric 43, of a predetermined size to form a rug, is positioned on the base 11 and work supporting plate 36 and the strand of yarn or other material to be used is threaded through the needle and when sewed through the material forms the pile of the rug.

The outer free end of the looper is beveled, as shown in Fig. 2, to permit easy entrance between the needle side and the strand in forming the loops, and the shoulder 30, at the outer end of the looper prevents the loops from slipping off when the looper is reciprocated rearwardly. In the formation of a loop the yarn has an upwardly extending portion 44 which engages with a notch 37 of the plate slot 35 to hold the formed loop tightly on the looper against slippage when the looper and feed reciprocate forwardly during the upward reciprocation of the needle.

In operation, the needle 34 having the strand threaded therethrough reciprocates downwardly through the fabric and through the needle slot of the plate 36. At the lower end of its reciprocation the needle enters the groove of the needle guide 33 to prevent any lateral flexure of the needle. The upward movement of the needle will cause the yarn strand to slacken, and at the same time the looper frame, carrying the looper and cutter, will move forwardly, to cause the outer end of the looper to move between the strand and the needle to a point where the looper shoulder 30 has passed beyond the strand. As the needle rises out of the fabric, the feeding members 39 move to push the fabric rearwardly and the looper frame also reciprocates rearwardly and during this movement the portion of yarn 44, forming one side of the loop, is caught on a notch 37. After reaching its highest point the needle starts downwardly and at the lowest point of the needle, the looper frame starts to move forwardly. During this forward movement of the looper frame, while the needle is moving upwardly, the loop is held taut by its engagement with a notch, but the cutter 32 engages the lower closed end of the loop, as in Fig. 3, and severs it, with a relatively long drawing action. At the same time that the severing of the previously formed loop is taking place, the end of the looper is moving into and engaging the next loop. Therefore, the action of the combined looper and cutter is such that one loop is being severed as the next loop is being caught so that only one complete loop is engaged by the combined looper and cutter at any given period. The cut loops form tufts on the fabric and as the work progresses said tufts move rearwardly in the elongated needle slot and are accommodated thereby. When the tufts reach the end of the needle slot they are withdrawn therefrom by the rearward movement of the fabric.

As previously brought out the cutter 32 may be easily removed from the plate 28 for sharpening or replacement and by shifting said plate 28 vertically the length of the loops and tufts may be easily varied, as desired.

It will be further understood that a number of said tufting attachments may be mounted on the same sewing machine to permit sewing a plurality of rows of stitches at the same time.

From the foregoing description it will be seen that the improved tufting attachment is of simple and novel construction, and is well adapted for the purposes described.

What I claim as my invention is:

1. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle, comprising a transversely reciprocal frame positioned below the fabric and carrying a looper arm and a cutter adjacent an edge portion of the looper arm, the looper arm being arranged to engage the strand to form loops below the fabric, means for reciprocating the needle and the frame member, the cutter being arranged to sever a previously formed loop during reciprocation of the frame to engage another loop on the looper arm, and means independent of the looper for holding a portion of the yarn of a loop taut during reciprocations of the frame member and the needle.

2. A tufting attachment for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle, comprising a transversely reciprocal frame positioned below the fabric, a looper arm having a lower engaging edge portion and vertically adjustably carried by said frame, a cutter adjustably and removably carried by said frame adjacent the looper arm and forming an angular continuation of the lower edge thereof, the looper arm being arranged to engage the strand to form loops below the fabric and the cutter being arranged to cut a previously formed loop engaged by the arm during reciprocation of the frame member, and means for reciprocating the needle and the transverse frame member.

3. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle, comprising a transversely reciprocal member positioned below the fabric and having a shouldered arm which engages the strand to form loops below the fabric, a cutter rigidly carried directly by the reciprocal member adjacent the shouldered arm and at an angle thereto and operable with the reciprocal member to sever previously formed loop while another loop is being caught by the shouldered arm, and means for reciprocating the needle and the transverse member.

4. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle, com-

prising a transversely reciprocal combination looper arm and cutter positioned below the fabric, and means for reciprocating the needle and the combination looper arm and cutter, a reciprocation of said latter member in one direction causing it to engage a strand to form a loop below the fabric and to simultaneously cut a previously engaged loop.

5. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle, comprising a transversely reciprocal combination looper arm and cutter positioned below the fabric, and means for reciprocating the needle and the combination looper arm and cutter, a forward reciprocation of said latter member causing it to engage a strand to form a loop below the fabric while simultaneously cutting a loop just previously engaged.

6. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle and a slotted work supporting plate through which the needle reciprocates, comprising a transversely reciprocal frame positioned below the fabric and carrying a looper arm and a cutter adjacent an edge portion of the looper arm, the looper arm being arranged to engage the strand to form loops below the fabric, and means for reciprocating the needle and the frame member, the cutter being arranged to sever a previously formed loop during reciprocation of the frame to engage another loop on the looper arm, there being means on said work supporting plate for engaging and holding a portion of the yarn of a loop taut during reciprocation of the frame member and the needle.

7. A tufting attachment for sewing machines having a reciprocating needle for penetrating a fabric and carrying a strand which is passed through the fabric by the needle, comprising a transversely reciprocal frame positioned below the fabric, a looper arm having a lower engaging edge portion and vertically adjustably carried by said frame, a cutter rigidly adjustably and removably carried by said frame adjacent the looper arm and forming an angular continuation of the lower edge thereof, the looper arm being arranged to engage the strand to form successive loops below the fabric and the cutter being arranged to successively cut each previously formed loop engaged by the arm during reciprocation of the frame member, and means for reciprocating the needle and the transverse frame member.

8. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating and carrying a strand through a fabric, comprising transversely reciprocal shouldered means below the fabric for forming the strand into loops, the shoulder preventing slippage of a loop from said means, a cutter rigidly carried by the reciprocal means for severing a loop while another is being formed, means momentarily engaged by the lower end portion of the needle for laterally reinforcing the needle, and means for reciprocating the needle and transverse member in timed relationship.

9. A tufting attachment mechanism for sewing machines having a reciprocating needle for penetrating and carrying a strand through a fabric, comprising a looper member below the fabric and movable transversely of the path of movement of the needle for engaging the strand and holding the same while a loop is being formed by an upward reciprocation of the needle, means rigidly carried by the looper member for severing the last formed loop to form pile members while the looper member is engaging the strand to form another loop, and means for reciprocating the needle and the looper member.

10. In a sewing machine having the usual needle, work feed, and means for guiding a strand to the needle, a fabric supporting plate having an elongated needle slot with a notch formed on one side of said slot, the needle reciprocating through the slot and fabric to successively carry the strand through both of the same, a looper member having a shouldered means below the plate opening to successively pass into and engage loops formed during upward reciprocations of the needle, a reciprocation of the needle and an advance movement of the work feed causing the strand to slacken and shift on one side of the needle and to engage in the notch of said slotted plate, means carried by the looper member for successively severing engaged loops to form piles, the notch of said plate holding the strand taut and against slippage during severing operations, and means for reciprocating the needle and the looper member.

11. A tufting machine attachment mechanism for sewing machines, comprising a transverse reciprocal member having an arm with a substantially horizontal lower engaging edge and a loop holding shoulder adjacent the free end of the arm, and a cutter rigidly removably carried by the reciprocal member inwardly of the outer end of the arm and forming an angular continuation of the engaging edge of said arm to cut material worked inwardly of the outer end of said arm.

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