June 19, 1934. E. E. BOYCE 1,963,349

SEWING MACHINE

Filed Nov. 28, 1931

Fig. 1

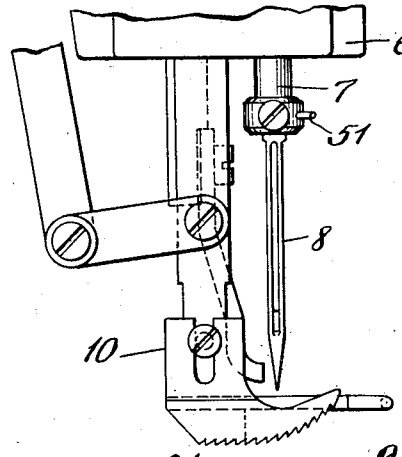
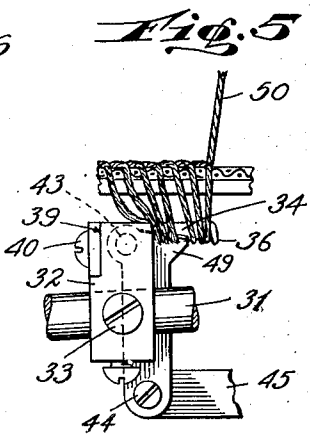


Fig. 5



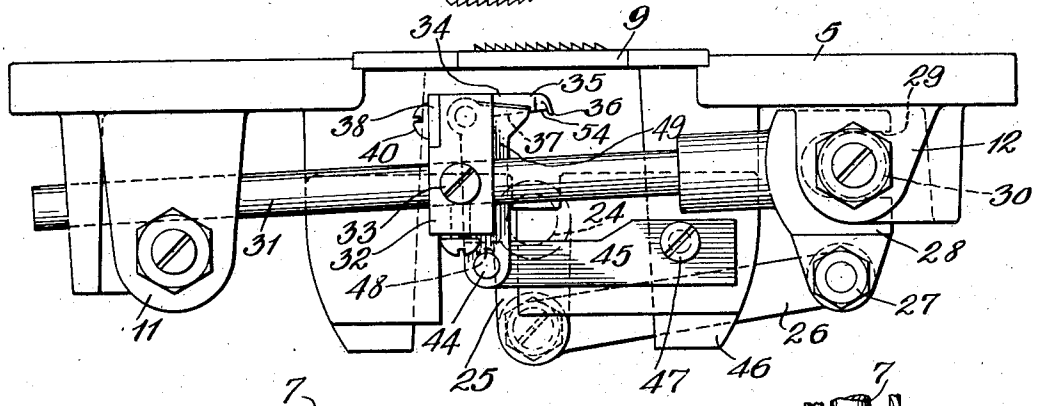


Fig. 2

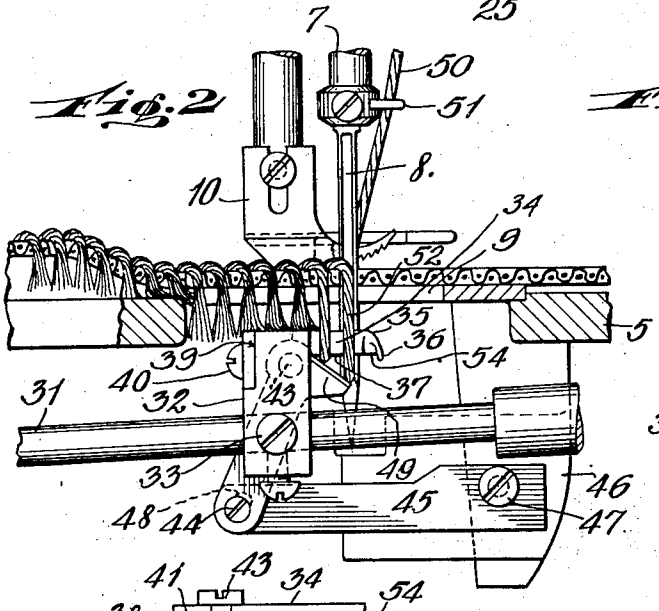


Fig. 3

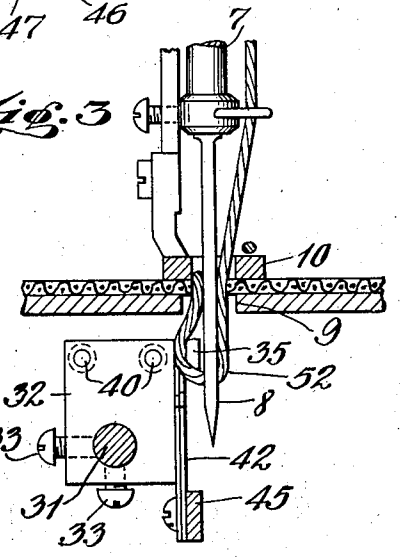
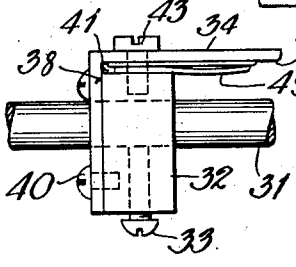


Fig. 4



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1,963,349

SEWING MACHINE

Erskine E. Boyce, Gastonia, N. C.

Application November 28, 1931, Serial No. 577,817

12 Claims. (Cl. 112—79)

My invention relates to sewing machines and particularly to improvements in tufting attachments for sewing machines for the production of pile fabrics, such as, bath mats, rugs, and the like, in which the loops formed in the thread when the needle passes through the fabric are received by a member and severed thereon to form the piling on the fabric.

The present invention aims chiefly to provide a tufting attachment comprising a loop receiving member and cutting blade to sever the loops, and in one form is embodied in the provision of a finger provided with a cutting edge and hooked end, the finger being carried on a reciprocating mounting for movement transverse to the reciprocating movement of the needle, and the cutting blade being pivoted to the mounting or finger in such a manner that it is operated by movement of the finger to cause its cutting edge to pass across the cutting edge of the finger to sever the loops with an extremely effective scissor like action. Provision is made for various adjustments in the relation of the attachment, and the parts thereof relative to the operating parts of the machine and to each other.

The above arrangement is particularly adapted for use on sewing machines provided with feed dogs or the like for moving the fabric. There are sewing machines though which are equipped with mechanism for causing the needle to move the fabric. In such machines the needle has not only an up and down reciprocating movement but also a back and forth movement whereby it pierces the fabric at a predetermined point in its downward movement and then moves backward or forward carrying the fabric with it. In applying the invention to such a machine the loop receiving finger would be positioned to receive the loops from the needle as the needle moves longitudinally of the finger, and, of course, the cutting blade would cooperate with the finger to sever the loops.

The objects of the invention include the provision of tufting attachments of the above type characterized by a simplicity of construction, which can be cheaply produced and operated, which function accurately and wherein the parts are readily accessible for repair, replacement, and adjustment.

A specific object of the invention is to provide simple and effective means for maintaining the cutting edges of the finger and blade in proper relative position to neatly and evenly sever the loops.

The foregoing and other objects and advantages of the invention will become apparent as the details of construction are pointed out during the course of the following description of the accompanying drawing wherein I have shown a preferred illustrative embodiment of the invention, and in which

Fig. 1 is a side elevation of portions of a sewing machine equipped with a tufting attachment embodying my invention;

Fig. 2 is an enlarged fragmentary side elevation of the apparatus shown in Fig. 1;

Fig. 3 is a fragmentary front elevation of the apparatus showing the parts in the position of Fig. 2; and

Fig. 4 is a top plan view of the loop receiving finger and cutting blade and their mounting.

Fig. 5 is a fragmentary view similar to Fig. 2 showing a possible modification.

Referring to the drawing, the numeral 5 designates the table of a sewing machine above which is the head 6 carrying the needle bar 7 which in turn supports the needle 8, it being understood that the needle bar 7 reciprocates within the head 6 so that the needle will reciprocate through the opening 9 over which the fabric is fed across the table of the machine. I have also shown a usual presser foot and its associated parts all indicated generally by the numeral 10. Brackets 11 and 12 are connected to the bottom of the table 5. A shaft 24, which is oscillated by mechanism, not shown, is connected by a link 25 to the arm 26 which is pivotally connected at 27 to frame 28, the frame 28 having a recess 29 which receives a pin 30 supported by the bracket 12. A shaft 31 is connected to the frame 28 at one end and its other end is mounted through an opening in the bracket 11 so that when the shaft 24 operates to reciprocate the link 25 and arm 26 the frame 28 will also be reciprocated with its recessed end moving back and forth on the pin 30 and thus imparting a reciprocating movement to the shaft 31.

A block 32 is secured on the shaft 31 for movement therewith by the set screw 33, and a loop receiving member 34, which comprises a finger portion 35 having a hook 36 at its free end and a cutting edge 37 between the hook 36 and the block 32, is secured to the block. The loop receiving member may have a portion 38 extending off of the finger 35 to be received in a seat 39 on the block 32 and held thereto by means of the screw 40. This arrangement provides a space 41 between the block and the finger 35 within which is disposed the upper end of a cutting blade 42 which is pivotally connected to the block 32 by

the screw 43 and the lower end of the blade 42 is pivotally connected at 44 to a fixed support such as an arm 45 which is secured to the bracket 46 by the screw 47, it being noted that in the embodiment shown, the cutting blade is provided with an enlarged opening or slot 48 through which the screw 44 is mounted for a reason hereinafter explained.

It is preferable to provide a spring 49 between the cutting blade 42 and the block 32 to bias the blade 42 toward the finger 35 and maintain them in face to face contact so that the cutting edges on the blade and the finger will have nice engagement when one is moved across the other during the operation of the device which is as follows:

The parts being assembled as shown in Fig. 1, a thread 50 is inserted through the usual eye 51 on the needle bar and through the needle. The fabric to be tufted is then placed under the presser foot above the opening 9 and the machine set into operation. When the needle pierces the fabric it assumes the position shown in Fig. 2 where a loop, such as indicated at 52, is formed beneath the fabric and as the needle brings the loop down the rod 31 is reciprocated in the manner above explained, so that the finger 35 passes through the loop and retains the loop when the needle ascends to the position shown in Fig. 1. I would have it understood that a portion 54 of the finger, indicated in Fig. 4, between the hook 36 and the end of the cutting blade 42 may be formed without a cutting edge to serve with the hook 36 as a loop retainer. When the needle again descends and pierces the fabric, the loop which has been caught on the portion 54 will be moved back on to the cutting edge 37 of the finger and as the block 32 advances the upper end of the cutting blade also moves forward and during such movement the blade pivots on the screws 43 and 44 so that the cutting edge of the blade is brought to the position of Fig. 2. Obviously, when the rod 31 moves backwardly as the needle ascends, the block 32 also moves backward and the loop or loops on the portion 54 are carried therewith and as the block advances such loops move on to the cutting edge of the finger and at the same time the blade 42 pivots on screws or pins 43 and 44 so that its cutting edge is brought to the position of Fig. 1. As the cutting edge of the blade meets or passes the cutting edge 37 of the finger the loop or loops therebetween are neatly and quickly severed.

The finger and blade are always maintained in close face to face engagement by the spring 49, and the action of the blade is quick and forceful due to its actuation by the reciprocating block.

It should be obvious that the block 32 can be constructed of any suitable material and can be of any shape or size and proportions, and may be secured to the shaft 31 by any means whatever. Although it is preferable to have the block secured to the shaft in a manner which will permit of adjustment on the shaft to position the finger relative to the needle, it may be formed as an integral part of the shaft. In fact, I contemplate and deem it possible to have the finger and block formed as one piece.

It should also be obvious that instead of providing the slot 48 it is possible to allow for slight movement of the arm 45 to compensate for the arc of movement through which the cutting blade passes when the part to which it is pivoted is reciprocated.

It is possible to either lengthen the member 35 or to make the blade 42 narrower so that a plurality of loops can be carried at one time on the portion of the member 34 beyond the blade, such an arrangement being shown in Fig. 5, where three loops are retained on the member in advance of the cutting blade to be fed back far enough to be severed evenly by the cooperating cutting edges on the blade and member as the member reciprocates.

I claim:

1. In a sewing machine of the character described including mechanism for reciprocating a needle, a member mounted to reciprocate in a plane intersecting the plane in which the needle reciprocates, a finger extending from said member across the path of movement of the needle and having a hook at its end and a cutting edge between said member and hook, a fixed support, and a cutting blade pivotally connected to said member and said support and operable by movement of said member to bring its cutting edge into cutting relation with the cutting edge of the finger.

2. In a sewing machine of the class described including mechanism for reciprocating a needle, a shaft mounted for reciprocation, a mounting on said shaft for movement therewith, a finger on said mounting movable therewith across the path of movement of the needle to receive loops from the needle, a support, and a cutting blade pivotally connected to said support by a fixed pivot, and said cutting blade being pivotally connected to said mounting by a movable pivot whereby reciprocating movements of said mounting swing the cutting edge of the blade to and away from the finger.

3. In a sewing machine of the class described including a table having an opening therein and mechanism for reciprocating a needle through said opening, a rod mounted for reciprocation beneath said table, a mounting adjustably mounted on said rod for reciprocation therewith, a finger carried by said mounting to reciprocate across the path of movement of the needle to receive loops therefrom, a fixed support, a cutting blade pivotally secured to the mounting and to said support, said cutting blade being operable by movements of the mounting, and means for adjusting said mounting and finger relative to said needle.

4. In a sewing machine of the class described including mechanism for reciprocating a needle, a block having a finger to extend across the path of movement of the needle, a cutting blade pivotally connected to said block in face to face relation with a portion of the finger, said finger and blade having cooperating cutting edges, a fixed support, said cutting blade being also pivotally connected to said support whereby reciprocating movement of said block will cause said cutting blade to move on its pivots to bring its cutting edge into open and closed positions with respect to the finger.

5. A tufting attachment for sewing machines comprising a mounting for connection with a reciprocating part, a loop receiving finger carried by said mounting, a cutting blade pivotally connected to said mounting adjacent one end, and a support pivotally connected to the cutting blade adjacent its other end, said first pivotal connection being movable and said second pivotal connection being fixed.

6. A tufting attachment for sewing machines comprising a mounting for connection with a reciprocating part, a loop receiving finger carried by said mounting, a cutting blade pivotally connected to said mounting and disposed between

portions of said mounting and said finger in face to face relation with said finger, and a fixed support pivotally connected to the other end of the cutting blade.

7. The structure of claim 6 wherein means is interposed between said cutting blade and mounting to urge said cutting blade against a surface of said finger.

8. The structure of claim 6 wherein the finger extends beyond the cutting blade and has a cutting edge substantially coextensive with the cutting edge of the blade, and is provided with a hook at its end beyond said cutting blade.

9. A tufting attachment for sewing machines comprising a rod for connection with a reciprocating part, a block mounted on said rod, a finger extending from said block said finger having a cutting edge, and a cutting blade pivotally connected to said block and operable by movement of said block to bring its cutting edge into cutting relation with the cutting edge on the finger to sever loops on the finger with a scissor-like action.

10. A tufting attachment for sewing machines comprising a rod for connection with a reciprocating part, a block adjustably mounted on said rod, a finger extending from said block, said finger having a cutting edge, and a cutting blade pivotally connected to said block and having a cutting edge cooperating with the cutting edge on the finger to sever loops on the finger, a support for connection with a fixed part, said cutting blade being pivotally connected at its other end to said support whereby reciprocating movement of said block will move said blade on said pivots to swing its cutting edge across the cutting edge on the finger.

11. In a sewing machine of the character described, including mechanism for reciprocating a needle, a loop receiving member including a finger movable back and forth in a path intersecting the path in which the needle reciprocates, said finger having a cutting edge, a cutting blade carried by and pivotally connected to said member and having a cutting edge cooperating with the cutting edge of the finger, said pivoted cutting blade having a depending portion, and a pivotal connection between said portion and a fixed part on the machine to cause the said two cutting edges to be moved into and out of cutting relation solely by the movement of said member.

12. A sewing machine of the character described including mechanism for reciprocating a needle, a loop receiving member including a finger having back and forth movement in a path intersecting the path in which the needle reciprocates, said finger having a cutting edge, a cutter member carried by and pivotally connected at its upper end to the loop receiving member and having a cutting edge cooperating with the cutting edge of the finger, said cutter member having a depending portion, a blade spring pressing upon a face of the said pivoted cutter member, and means pivotally connecting the depending portion of the pivoted cutter member to a fixed part for causing the said two cutting edges to be moved into and out of cutting relation solely by the backward and forward movement of the loop receiving member.

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