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LOOP SHEDDER

Filed June 23, 1958

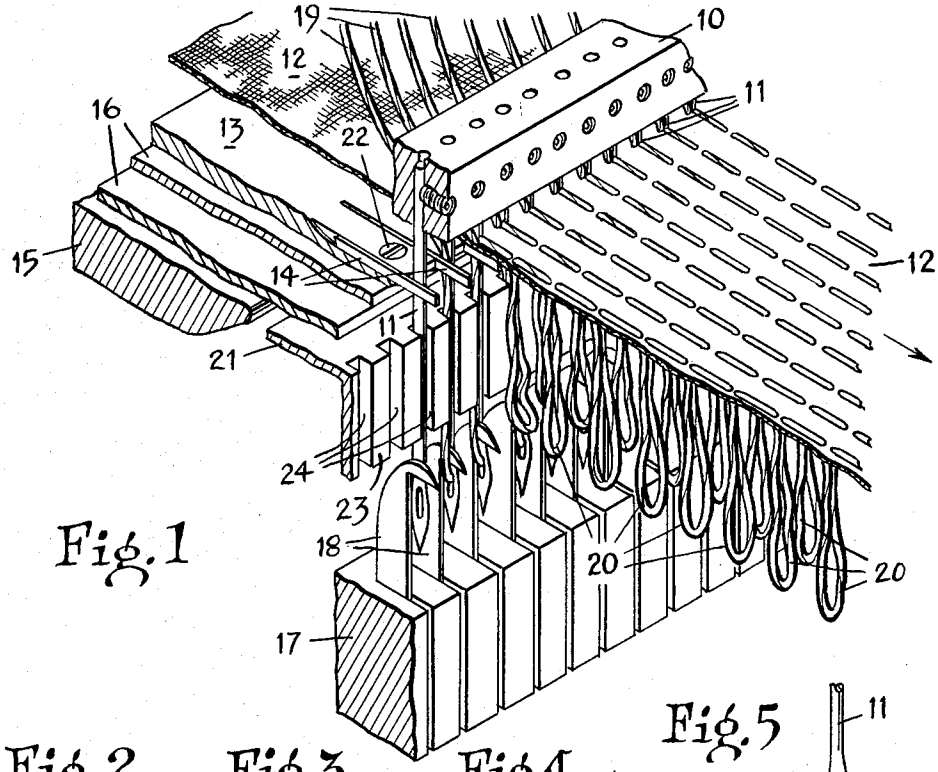
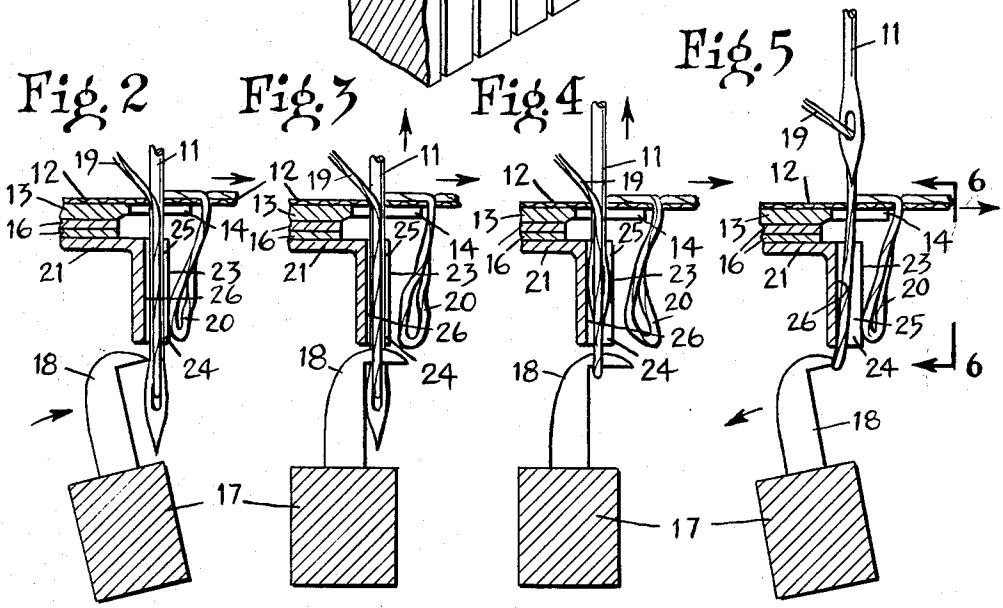


Fig. 1

Fig. 2 Fig. 3 Fig. 4 Fig. 5



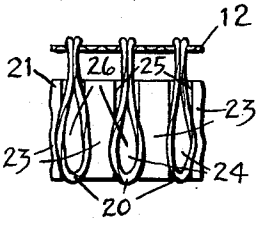


Fig. 6

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LOOP SHEDDER

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3 Claims. (Cl. 112—79)

This invention relates to a loop pile tufting machine and more particularly to a device for preventing the needles from "tagging" the loops formed by a tufting machine.

Heretofore in the formation of loop pile by tufting, methods have been sought to prevent a loop of yarn formed by a tufting needle through a base fabric from entering the path of the reciprocating needle upon its next successive stroke. Such occurrences permit the needle to spear or "tag" the yarn loop formed on the previous stitch causing the point of the needle to drive the loop down and make that particular loop longer than the other loops and also more ragged in appearance. Such unsightly defects in rugs or other fabrics result in "rejects" which are quite costly to the manufacturer. The problem of "tagging" has been particularly acute in the formation of long loops, that is where the nap height is approximately ¾ inch or higher.

One method of overcoming the problem of "tagging" is to provide in a tufting machine a second set of loopers or loop hooks to which may be transferred the loops formed by the first set of loop hooks. Such a solution is quite expensive and limits the versatility of the tufting machine.

It is therefore an object of this invention to overcome the disadvantages enumerated by providing a loop pile tufting machine having a comparatively simple mechanism for preventing loops from being speared or "tagged" by the needles on their next successive stitch or stroke. Another object of this invention is to provide in a loop pile tufting machine a guard member for preventing a loop formed in the base fabric from reentering the path of the reciprocating needle.

Another object of this invention is to provide a device for positively stripping the loop formed by a needle through a base fabric from the loop hook and to prevent the return of the loop into the path of the needle.

A further object of this invention is to provide in a loop pile tufting machine a device for simultaneously positively stripping and stretching the loop formed by a needle through a base fabric and a guard member for preventing a spread loop released from the tension of the loop hook from entering the path of the reciprocating needle.

Another object of this invention is to provide in a loop pile tufting machine a guard member containing a passage for a needle therethrough and permitting the exit of a loop therefrom but preventing reentry of the loop into the path of the needle.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the drawings, wherein:

Fig. 1 is a perspective view of the invention;

Fig. 2 is a fragmentary side elevational sectional view disclosing the needle in its lowermost position and the loop hook moving toward the needle;

Fig. 3 is a view similar to Fig. 2 in which the loop hook has crossed the needle to begin the formation of a loop;

Fig. 4 is a view similar to Fig. 3 in which the loop hook retains the loop while the needle moves upward;

Fig. 5 is a view similar to Fig. 4 disclosing the operation of the invention to release the loop from the loop hook and prevent the previously formed loop from reentering the path of the needle; and

Fig. 6 is a section taken along the line 6—6 of Fig. 5.

Referring now to the drawings in more detail, Fig. 1 discloses a needle bar 10 containing a row of needles 11 and adapted to be reciprocated in a well known manner by push rods and eccentric mechanisms, not shown, in a conventional multiple needle tufting machine. The needles 11 are adapted to be reciprocated through a base or backing fabric 12 fed through the machine in a well known manner in the direction of the arrow from the front to the rear of the machine. The base fabric 12 is supported on the throat plate or needle plate 13 having prongs or fingers 14 extending between the needles 11 to support the fabric. The needle plate 13 is mounted to the machine frame or bed plate 15 in the usual manner and may be elevated above the bed plate 15 by means of shims 16 in order to provide the proper nap height.

A loop hook block or holder 17 carries a loop hook or looper 18 for each needle 11 and is mounted below the needle plate 13 to reciprocate the hooks 18 across the needles 11 in their lowermost position in order that the hooks may engage the pile yarns 19 to form loops 20 thereby, in a manner well known to the art.

The mechanisms thus far described are old in the art of multiple needle loop pile tufting.

The improvements for positively shedding or stripping the loops 20 from the hooks and preventing the loops from re-entering the path of the reciprocating needles 11 comprises a rigid guard member 21 stationarily mounted between the needle plate 13 and the loop hooks 18 and extending transversely of the machine. The guard member 21 may be secured to the needle plate 13 by means of screws 22 or may be secured to any other part of the machine which is convenient. The rear face 23 of the member 21 is substantially flat and has formed therein a plurality of vertically disposed channel-shaped slots 24, each slot being axially aligned with a reciprocating needle 11. Each slot 24 has a pair of side walls 25, a front wall 26 and is open in the rear. The dimensions of each slot 24 is just sufficient to permit the free passage therethrough of a needle 11 and the yarn 19 carried thereby. The bottom of each slot 24 is proximately spaced above the top of the loop hook 18, so that the top of the reciprocating hook 18 just barely clears the bottom of the guard member 21.

The operation of the machine is as follows:

With the needle bar 10, the fabric feed mechanism and the hook bar 17 in synchronous operation for forming loop pile 20 in the base fabric 12, each needle 11 will descend through the fabric 12 carrying a yarn 19 while its corresponding loop hook 18 is in its forward retracted position (Fig. 2). As the needle descends through the fabric 12 with a yarn 19, it passes through its corresponding slot 24 in the guard member 21. When the needle 11 reaches its lowermost position, the loop hook 18 is reciprocated toward the rear of the machine and between the needle 11 and the yarn 19 to begin the formation of a loop 20 thereby, as disclosed in Fig. 3. As the needle 11 reciprocates upward through the slot 24 and the fabric 12 to its uppermost position, the loop hook 18 retains the yarn 19 to form a loop 20, as disclosed in Fig. 4. After the needle 11 has risen above the fabric 12, the loop hook 18 begins to travel forward to release the loop formed thereby. In order to positively strip the loop 20 from the loop hook 18 and also to create an additional amount of tension in the

loop, the position of the front wall **26** of the slot **24** is such that it arrests the forward movement of the loop **20** caused by the forward motion of the loop hook **18** and consequently removes the loop of yarn within the slot **24** from the loop hook **18**, as disclosed in Fig. 5. When the loop of yarn under tension within the slot **24** is suddenly released from the loop hook **18** by the proximately spaced front wall **26**, the loop immediately snaps upward and is carried out of the slot **24** through the rear opening by the movement of the fabric **12**. As soon as the newly formed loop **20** is clear of the slot **24**, the reaction of the loop to the excess tension created by the loop hook **18** and the front wall **26** of the slot **24** causes the loop **20** to crinkle or spread out, so that its greatest transverse dimension is greater than the width of the slot **24**. Consequently, once the loop **20** has been expelled from the slot **24**, it cannot re-enter the slot into the path of the reciprocating needle **11**.

Thus the loops **20** are positively stripped from the loop hooks **18** and also effectively prevented from returning to the paths of the needles **11** in order to prevent spearing or "tagging" of the loops which causes unsightly defects in the tufted fabric.

Although this invention may be adapted to the formation of tufted loop pile of various nap heights, it has been found to be particularly effective in the prevention of "tagging" of long loops of nap heights ¾ inch or higher.

It will be apparent to those skilled in the art that various changes may be made in the invention, without departing from the spirit and scope thereof, and therefore the invention is not limited by that which is shown in the drawings and described in the specification, but only as indicated in the appended claims.

What is claimed is:

1. In a tufting machine including a reciprocable needle, a support for a fabric in the path of said needle, means for feeding said fabric in a direction transverse to said needle and a loop hook for forming loops in yarn stitched through said fabric by said needle, a guard member for preventing the loop from re-entering the path of said reciprocable needle comprising a pair of members spaced transverse of the direction of fabric feed apart from and on opposite sides of the path of said needle and spanning the major portion of the distance between said fabric support and said loop hook, each member having a co-extensive loop engaging surface substantially parallel to the needle axis and facing in the direction of fabric feed, said surfaces being spaced from said needle axis less than a stitch length in the direction of fabric feed and spaced apart sufficiently to permit the passage therebetween of a closed loop but to block the re-entry of a spread loop.

2. In a tufting machine including a reciprocable needle, a support for a fabric in the path of said needle, means for feeding said fabric in a direction transverse to the needle, a loop hook pointing in the direction of fabric feed, and means for reciprocating said hook in the direction of fabric feed to form loops in yarn stitched through the fabric by the needle, a guard member for preventing the loop from re-entering the path of the needle comprising a slot of uniform cross-section axially aligned with said needle to permit free reciprocation therethrough of said needle and yarn carried thereby, said slot having side walls spaced transverse of the direction of fabric feed on opposite sides of the path of said needle and spanning the major portion of the distance between said fabric support and said loop hook, said side walls terminating in spaced apart loop engaging surfaces parallel to and spaced beyond the path of the needle less than a stitch length in the direction of the fabric feed, the spacing between said loop engaging surfaces being greater than the width of a closed loop but less than the maximum spread of an open loop.

3. The invention according to claim 2 in which said slot comprises a wall connecting said side walls on the opposite side of said needle path from said loop engaging surfaces, said connecting wall being spaced proximate to said loop hook and adapted to strip a loop from a hook reciprocating away from said needle.

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