

Dec. 16, 1930.

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1,785,625

RUG TUFTING MACHINE

Filed July 31, 1928

3 Sheets-Sheet 1

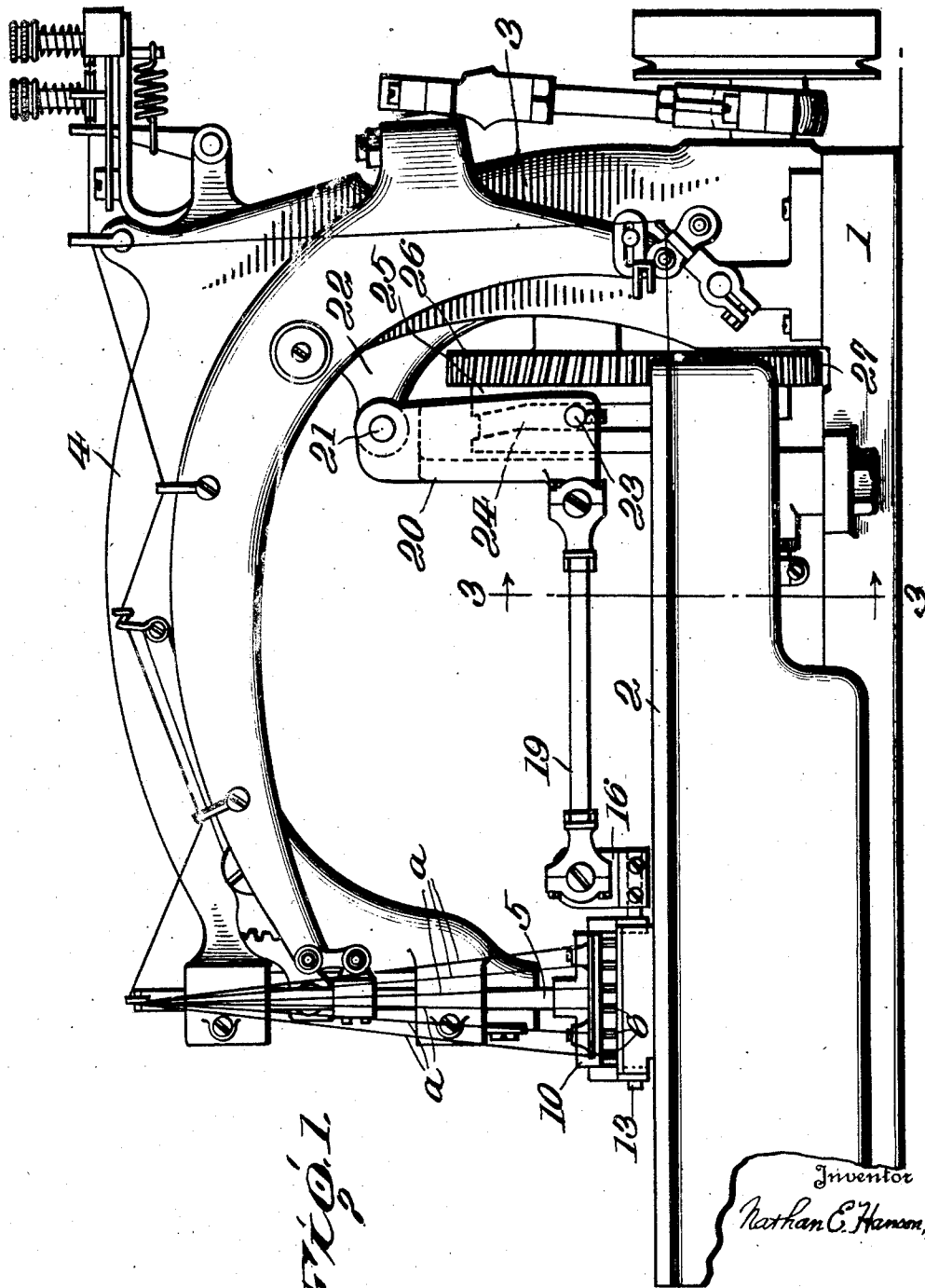


FIG. 1

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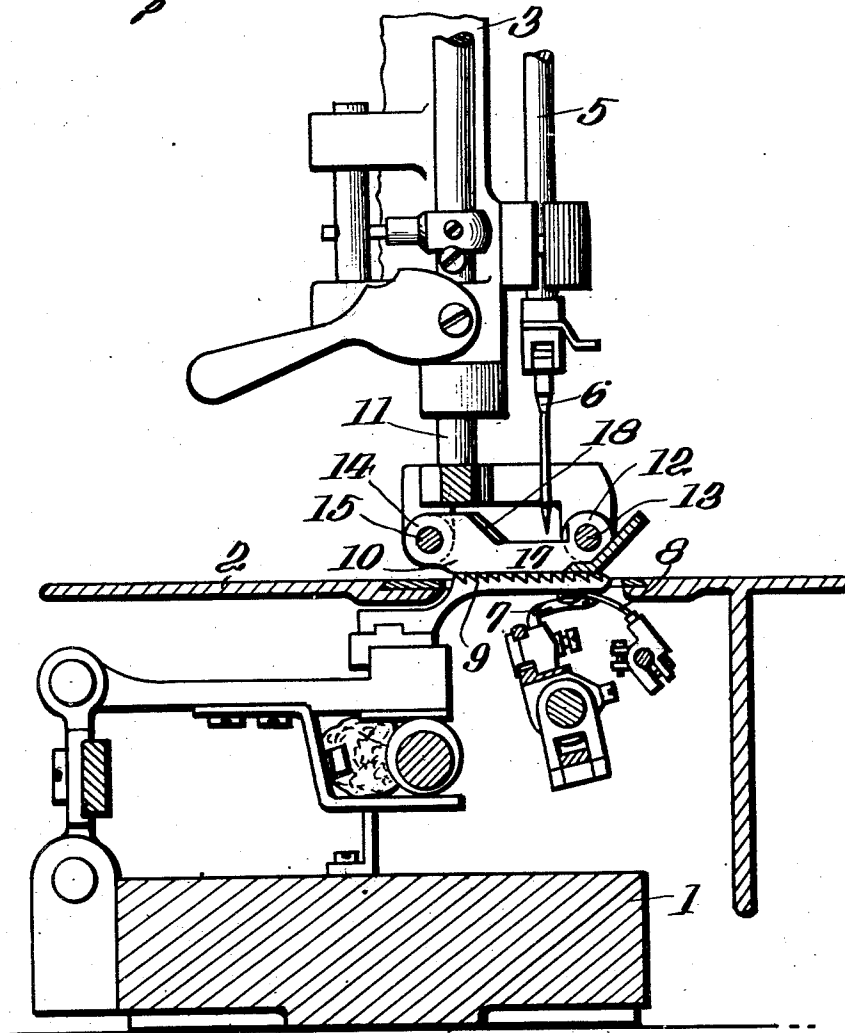
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Filed July 31, 1928

3 Sheets-Sheet 2

FIG. 2.



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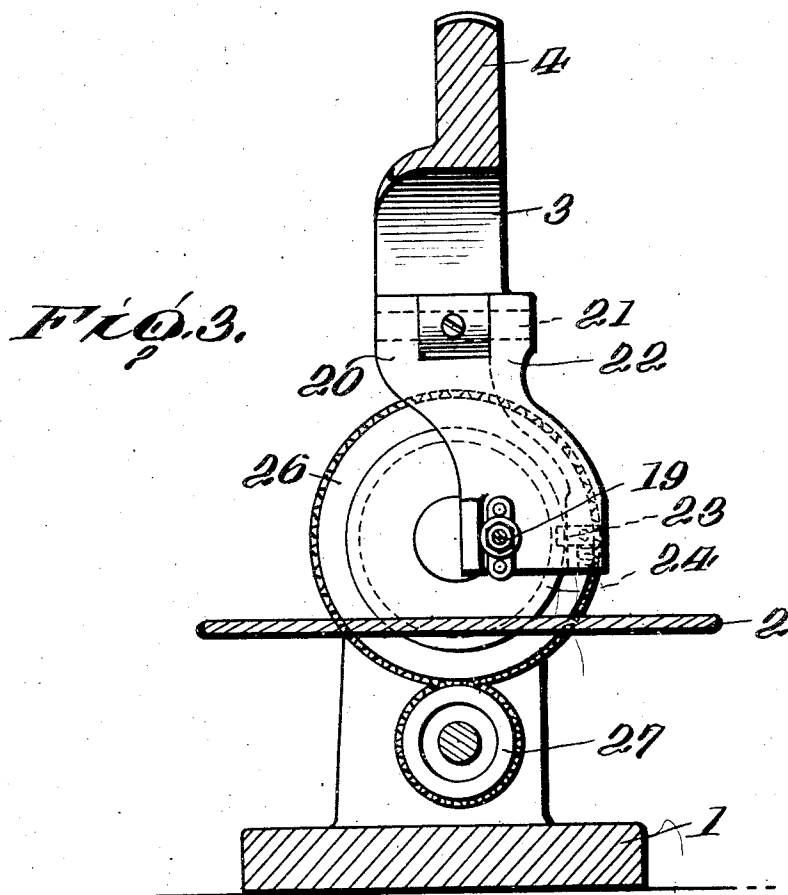
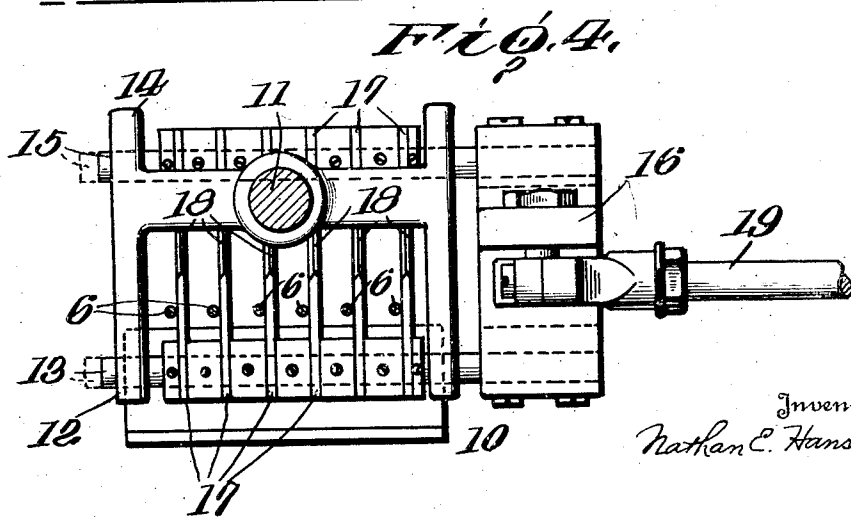
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Filed July 31, 1928

3 Sheets-Sheet 3



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RUG-TUFTING MACHINE

Application filed July 31, 1928. Serial No. 296,522.

The invention relates to new and useful improvements in a sewing machine, and more particularly to a sewing machine which is adapted to make a rug by tufting a fabric base.

An object of the invention is to construct a machine having a plurality of needles for forming a plurality of rows of stitches wherein means is provided for forming tuft lengths between consecutive stitches and severing the tufting thread to form tufts.

A further object of the invention is to provide a machine of the above type wherein tuft lengths between consecutive stitches are formed by a forming plate associated with each needle, which forming plate is shifted laterally to a position first on one side of the needle at one stitch, and on the other side of the needle at the next stitch so as to engage the tufting thread between stitches for forming the tuft lengths and for severing the tufting thread to form the tufts.

These and other objects will in part be obvious and will in part be hereinafter more fully described.

In the drawings which show by way of illustration one embodiment of the invention:—

Figure 1 is a front view of the machine embodying the invention.

Fig. 2 is a vertical sectional view through a portion of the machine at one side of the needles;

Fig. 3 is a vertical sectional view on the line 3—3 of Fig. 1;

Fig. 4 is a view partly in section, and partly in plan showing the means for supporting and shifting the forming plates on the presser foot.

The invention is directed to a sewing machine having a plurality of needles each of which is threaded with a tufting thread. Cooperating with each needle beneath the work support is a looper which passes an interlocking loop through the loop formed in the tufting thread for securing the tufting threads to the fabric base. Associated with each needle is a forming plate. This forming plate lies alongside of the needle. The forming plates are all mounted on a shiftable head which is moved laterally after each stitch

formation. The forming plate is moved across the path of the needle with which it is associated when the needle is at the upper end of its stroke, and thus the tufting thread between consecutive stitches in each stitching line is laid over this forming plate and thus a definite tuft length formed. When the fabric is fed these threads laid over the forming plates are moved rearwardly on the plates and brought into engagement with a knife associated with each forming plate so that the tufting thread is severed midway between the loops formed therein, thus it is that the tufts are formed.

Referring more in detail to the drawings, the sewing machine to which the invention is applied includes a supporting bed 1 carrying a cloth plate 2, a standard 3 having an overhanging arm 4 in which a needle bar 5 is reciprocated. This needle bar 5 as shown in the drawings is provided with a plurality of needles. These needles are all similar and are indicated by the numeral 6. Cooperating with each needle beneath the work support is a threaded looper 7 and a retainer 8. The loopers move in the line of feed and the stitch forming mechanism operates in the usual way. Each needle is provided with a tufting thread, indicated at *a* in the drawings. The needle punctures the fabric base and forms therethrough a loop in its tufting thread. The looper enters this loop in the tufting thread and secures the same to the fabric base. This is the usual form of stitch forming mechanism for forming independent lines of stitching, and it is not thought necessary to describe in detail the operating mechanism for the various parts.

The material is fed across the work support 2 by means of a feed dog 9. The material is held on the work support by a presser foot 10 carried by a presser bar 11 mounted in the overhanging arm 4. The presser foot 10 is provided with lugs 12 disposed on the presser foot well in front of the needles 6. A rod 13 passes through these lugs 12 and lies in a line at right angles to the line of feed. The presser foot is also provided with lugs 14 at the rear side thereof, and a rod 15 is mounted in these lugs and located at right angles to

the line of feed. The two rods 13 and 15 are joined by a cross head 16. Mounted on these rods are forming plates 17, one for each needle. The plates 17 are spaced substantially the same distance as the spacing of the needles. As shown in Figure 4 all of these forming plates are on the right side of the needles 6. When the cross head is shifted to the left it will move the rods to the dotted line position and will move the forming plates to the other side of the path of the needles. This of course takes place when the needles are all the way up. As a result the thread between consecutive needle punctures will be laid over this forming plate, and the forming plate determines the length of the tuft. As the feed moves the fabric base it will carry these tufting thread lengths laid over the forming plate rearwardly and cause said threads to engage a knife 18 which is associated with each forming plate and is preferably formed integral therewith. This knife 18 is inclined, and is provided with a sharp cutting edge so that it severs the tufting thread brought into contact therewith by the feed of the fabric base. The knife of course shifts with the shifting of the forming plate.

At each reciprocation of the needle bar loops are formed in a series of tufting threads which are inserted through the fabric base, and each loop is secured by the looper thread on the under face of the fabric base. As the needles reach the upper end of their stroke, the forming plate crosses the path of the needle and engages the tufting thread so that in effect a loop is formed in each tufting thread which extends upwardly over the fabric base. These loops are then severed as the fabric base is fed through the machine, and thus it is that the individual tufts are formed.

The cross head is reciprocated by means of a link 19 connected to a lever 20 pivoted at 21 to a bracket arm 22 carried by the standard 3 of the machine. This lever is provided with a roller 23 which runs in a cam groove 24 formed in a drum 25. The drum is mounted on a stub shaft and is provided with a gear 26 meshing with a gear 27 on the main shaft of the machine. These gears are so proportioned that the cross head can be moved in one direction on one stroke of the needle and in the opposite direction on the next stroke of the needle.

It is obvious that a series of tufts will be formed at each reciprocation of the needle bar, and a series of rows of tufts formed as the stitching progresses. These tufts are so close together in their rows and the rows are so close together that the tufts when completed will mat together and completely cover the upper face of the fabric base. I lay no claim to the article, or broadly to the method of making the same which includes forming plates, as these features are the invention of Albert S. Riviere, and are shown, described

and claimed in his application Serial No. 291,550, filed July 10, 1928.

The present invention is directed particularly to a machine having a plurality of needles for forming a plurality of tufts simultaneously, and to the shifting of the forming plate for the forming of loops between consecutive stitches and the severing of the same, although from certain aspects of the invention a single needle may be used.

It is obvious that minor changes in the details of construction and the arrangement of parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus fully described my invention, what I claim as new and desire to secure by Letters Patent, is:—

1. A rug tufting machine comprising a feeding mechanism, a thread carrying needle, a complemental stitch forming mechanism cooperating therewith, a forming plate extending in the direction of feed over which the needle thread is laid between consecutive stitches, means for shifting said plate across the path of the needle for each reciprocation thereof, and a cutter associated with said plate for cutting the threads laid over the plate.

2. A rug tufting machine comprising a feeding mechanism, a presser foot, a tufting thread carrying needle, a complemental stitch forming mechanism cooperating therewith, a forming plate mounted on the presser foot and extending in the direction of the feed, a severing device associated with said forming plate, and means for shifting the forming plate across the path of the needle for each reciprocation thereof whereby the thread between consecutive stitches is laid over said plate in loop form and is carried by the feed against the severing device where it is severed.

3. A rug tufting machine comprising a plurality of thread carrying needles operating in fixed lines, a complemental stitch forming mechanism cooperating with each needle, and a separate means associated with each needle for forming loops in the needle thread between consecutive stitches and severing the same to form tufts.

4. A rug tufting machine comprising a feeding mechanism, a plurality of thread carrying needles, a complemental stitch forming mechanism cooperating with each needle, a forming plate associated with each needle and extending in the direction of feed, means for moving said forming plates laterally across the paths of the needles so that the needle threads between consecutive stitches are laid over the forming plates, and means for severing the loops formed on the forming plates so as to provide tufts.

5. A rug tufting machine comprising a feeding mechanism, a presser foot cooperat-

ing therewith, a plurality of thread carrying needles, a thread carrying looper cooperating with each needle, a forming plate associated with each needle and extending in the direction of feed, means for supporting the forming plates and for shifting the same across the paths of the needles after each reciprocation of the needles, and means associated with each forming plate for severing the threads laid over the forming plates.

6. A rug tufting machine comprising a feeding mechanism, a presser foot cooperating with the feeding mechanism, a plurality of thread carrying needles, a thread carrying looper cooperating with each needle, rods mounted on said presser foot and shiftable at right angles to the line of feed, a series of forming plates one for each needle on said rods and shiftable across the path of the needles at each reciprocation thereof, and means associated with each forming plate for severing the threads laid over the forming plate.

7. A rug tufting machine comprising a feeding mechanism, a presser foot cooperating with the feeding mechanism, a plurality of thread carrying needles, a thread carrying looper cooperating with each needle, rods mounted on said presser foot and shiftable at right angles to the line of feed, a series of forming plates one for each needle on said rods and shiftable across the path of the needles at each reciprocation thereof, means associated with each forming plate for severing the threads laid over the forming plate, a cross head attached to said rods, a tufting lever, a link connecting said lever to said cross head, and a rotating cam drum for shifting said lever, said drum being timed so as to shift the cross head to move the forming plates across the path of the needles for each reciprocation thereof.

8. A rug tufting machine comprising a feeding mechanism, a presser foot cooperating with the feeding mechanism, a plurality of tufting thread carrying needles, means cooperating with each needle for securing the loop formed in the tufting thread thereby, rods mounted on the presser foot one in front of the needles and the other in rear thereof for endwise movement in a direction at right angles to the line of feed, a series of forming plates carried by said rods and associated with each needle, said forming plates in rear of the needles having cutting edges, a cross head attached to said rods, and means for moving said cross head to carry the forming plates across the paths of the needles for each reciprocation thereof.

9. A rug tufting machine comprising a feeding mechanism, a presser foot cooperating with the feeding mechanism, a plurality of tufting thread carrying needles, means cooperating with each needle for securing the loop formed in the tufting thread thereby,

rods mounted on the presser foot one in front of the needles and the other in rear thereof for endwise movement in a direction at right angles to the line of feed, a series of forming plates carried by said rods and associated with each needle, said forming plates in rear of the needles having cutting edges, a cross head attached to said rods, means for moving said cross head to carry the forming plates across the paths of the needles for each reciprocation thereof, said last named means including a cam drum, a lever oscillated by said cam drum, and a link connecting said lever to said cross head.

In testimony whereof, I affix my signature.
NATHAN E. HANSON.

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