Feb. 9, 1932. W. MYERS 1,844,435

LOOP CUTTING DEVICE FOR FABRIC PILE FORMING MACHINES

Filed June 26, 1930

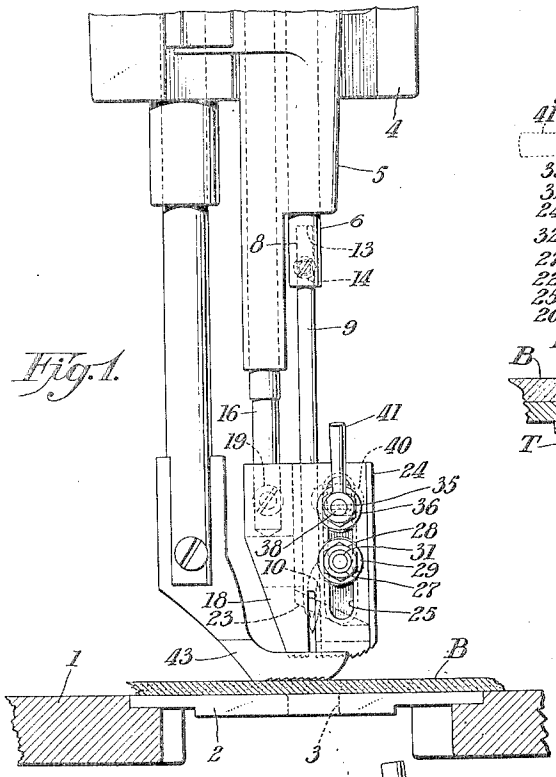


Fig. 1.

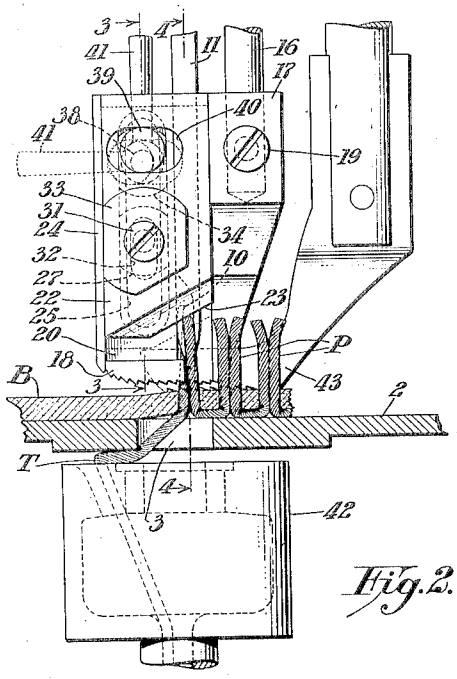


Fig. 2.

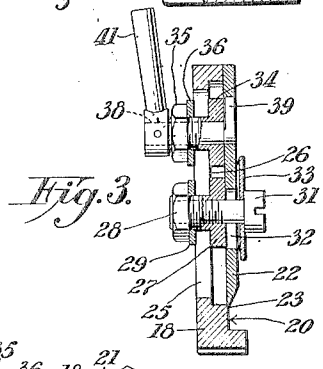


Fig. 3.

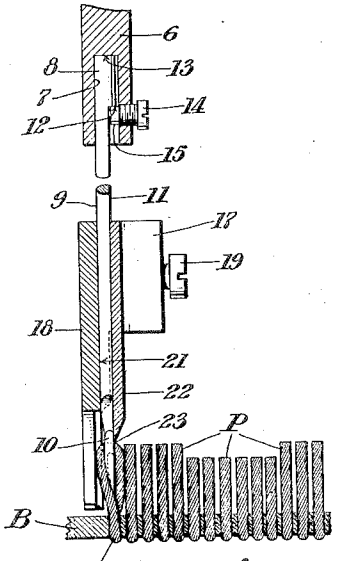


Fig. 4.

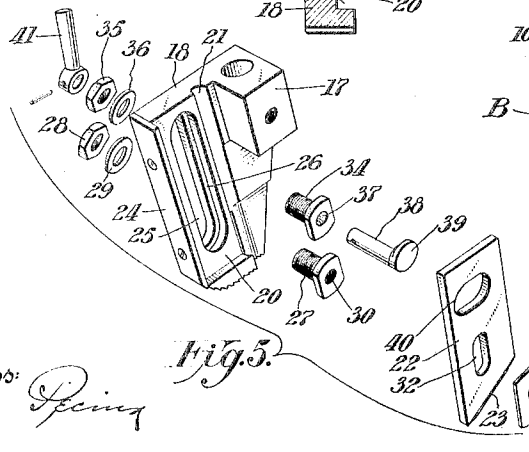


Fig. 5.

Inventor
Walter Myers
By Henry J. Miller
Attorney

Witness:
Godfrey Spring

Patented Feb. 9, 1932 1,844,435

UNITED STATES PATENT OFFICE

WALTER MYERS, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, OF ELIZABETH, NEW JERSEY, A CORPORATION OF NEW JERSEY

LOOP-CUTTING DEVICE FOR FABRIC-PILE FORMING MACHINES

Application filed June 26, 1930. Serial No. 463,861.

This invention relates to improvements in machines for producing pile fabrics which comprise a base material from at least one face of which project cut-open loops of thread, yarn and the like.

The primary object of the present invention is to provide a fabric-pile forming mechanism with convenient means for rapidly changing from the production of a pile of one length to another length. A further object of the invention is to provide adjustable means for predetermining the range of effective action of the pile-length changing means.

The foregoing and other objects and advantages in view, together with means whereby the same may be carried into effect, will best be understood from the following description of a preferred embodiment thereof illustrated in the accompanying drawings, in which:

Fig. 1 is a front end elevation, partly in section, of a portion of a sewing machine comprising a fabric-pile forming mechanism having the present improved pile-length controlling device. Fig. 2 is an elevation of the pile forming mechanism viewed from the side opposite to that shown in Fig. 1, with the throat-plate in section and including the thread-presenting looper. Fig. 3 is a vertical section of the knife-carrying feeding foot, substantially on the line 3—3 of Fig. 2. Fig. 4 is a vertical section of the feeding foot and the lower portion of the needle-bar substantially on the line 4—4 of Fig. 2. Fig. 5 represents in perspective the feeding foot and the loop-severing knife, together with the knife adjusting and shifting elements.

The present improvement has been embodied in the sewing machine forming the subject of my prior patent application filed April 25, 1930, with Serial No. 447,174, to which application reference may be had for a more complete disclosure of details of construction of the machine. The present invention is, furthermore, in the nature of an improvement in the thread loop cutting device of my U. S. Patent No. 1,793,866, issued Feb. 24, 1931.

Referring to the drawings, the sewing machine in which the present improvement has been embodied has the usual cloth-plate 1 upon which is suitably secured a throat-plate 2 provided with a needle-aperture 3 elongated in the direction of seam-formation. Overhanging the cloth-plate 1 is a bracket-arm terminating at its free end in a head 4 in which a vibratory frame 5 is pivotally supported for swinging movements in the line of feed.

Journaled for endwise reciprocation in the frame 5 is a vertically disposed needle-bar 6 having in its lower end a socket 7 receiving the round butt end 8 of a loop-forming implement, comprising in the present instance a needle 9 provided with a thread-loop seizing hook 10. The needle 9 is cut away or slabbed at one side from the needle point throughout the greater part of the needle length to provide a flat surface 11 terminating in a shoulder 12 formed by the round butt end 8 of the needle. The butt end of the needle is in engagement with the end wall 13 of the needle-bar socket 7 and is confined in said socket by a teat-screw 14 threaded into the needle-bar in position so that the reduced end 15 of the screw 14 underlies the needle-shoulder 12 and slightly clears the slabbed surface 11 of the needle. The described needle-securing means permits the needle to turn slightly about the longitudinal axis of the needle-bar and thereby to assume a position with its slabbed surface 11 disposed flatwise in engagement with a thread-loop severing knife-blade hereinafter described.

Also journaled for endwise reciprocation in the vibratory frame 5 is a vertically disposed feed-bar 16 upon the lower end of which the vertically socketed shank-block 17 of a feeding-foot 18 is secured by means of a screw 19. One of the side faces 20 of the feeding foot is provided with a vertically disposed groove 21 slidingly receiving the rounded side of the needle 9 and of sufficient depth whereby the flat face 11 of the needle is substantially flush with the side face 20 of the feeding foot.

Adjustably carried by the feeding foot 18 is a knife-blade 22 disposed flatwise in engagement with the side face 20 of the feeding foot so as to be slidingly engaged by the flat

face 11 of the needle. The lower end of the knife-blade 22 has a cutting edge 23 inclined to the path of and slidingly traversed by the needle hook 10. The knife-blade 22 is confined to vertical adjustment upon the feeding foot between the adjacent face of the shank-block 17 and a guide-flange afforded by a plate 24 suitably secured upon the front edge of the feeding foot, it being of course obvious that the guide-flange 24 might be formed integrally with said foot.

The feeding-foot 18 has a vertical slot 25 disposed adjacent to the groove 21 and providing a guide-shoulder 26 facing the knife-blade. Adjustably seated upon the guide-shoulder 26 is a T-bolt 27 projecting through the slot 25 and secured by a nut 28 and a washer 29. The bolt 27 has a threaded aperture 30 for receiving a stop-screw 31 passing through a vertically elongated slot 32 in the knife-blade. A friction washer 33 is interposed between the knife-blade and the head of the stop-screw 31, the latter being tightened to an extent insuring that the knife-blade is maintained in its selected thread-cutting position during the operation of the machine.

Another T-bolt 34, disposed above the bolt 27, is seated upon the guide-shoulder 26 and is secured by a nut 35 and washer 36 for vertical adjustment in the slot 25. The bolt 34, lengthwise thereof, has an aperture 37 providing a bearing for a short spindle 38 having at one end an eccentric head or cam 39 disposed within a horizontally elongated slot 40 in the knife-blade 22. The opposite end of the spindle 38 projects beyond the nut 35 and carries a crank-arm 41 suitably pinned upon the spindle.

As in the machine of my patent application Serial No. 447,174, the needle 9 is reciprocated vertically to penetrate a base-fabric B on its downstroke, and upon its upstroke to seize the thread T presented by the rotary looper 42, whereupon the needle carries the thread in the form of a loop upwardly through the base-fabric. Before completing its upstroke, the needle carries the thread-loop against the cutting edge 23 of the knife-blade, whereupon the thread-loop is cut open substantially at the middle of the loop bight to form separated loop-limbs constituting a fabric pile P.

For certain classes of work it is desirable to change the length of the fabric pile P and preferably at regular intervals, whereby a ridged or ribbed effect is obtained. The present improvement is particularly adapted for conveniently and rapidly determining the fabric-pile length by including provision for relatively shifting the loop-forming means and the loop-severing device into successively different but predetermined positions. In this present case, it is the severing device which may be shifted by manually turning the crank-arm 41 whereby the cam 39 of the crank-arm spindle 38 acts to raise or lower the knife-blade 22 in its vertical guideway in the feeding foot 18.

The extent of turning movement of the crank-arm 41, i. e., the range of effective action of the knife-shifting means, may be limited by vertical adjustment of the T-bolt 27 in the slot 25, to thereby determine the position of the stop-screw 31 in the vertical slot 32 of the knife-blade. For instance, when the crank-arm 41 is in its extreme upper position and the stop-screw 31 is adjusted toward the lower portion of the knife-slot 32, the crank-arm may be manually turned to its extreme lower position, thereby shifting the knife-blade its maximum distance. It will thus be understood that in the operation of the machine, a plurality of severed loops or rows of severed loops may, for example, be formed with the knife occupying its extreme upper position upon the feeding foot, whereby a fabric pile is produced of the maximum length within a definite field of pile length. The knife-blade may then be shifted to its lowest position by merely turning the crank-arm 41 a half revolution, whereupon a fabric pile of the minimum length within said field of pile length may be produced for a period again determined by the operator. The different positions into which the crank-arm is turned are maintained during the operation of the machine by the action of the friction-washer 33 upon the knife-blade.

By adjusting the T-bolt 27 to position the stop-screw 31 substantially in the middle of the length of the knife-slot 32, the crank-arm can be turned only a quarter revolution and accordingly the knife is shifted a less distance than before and the difference in the lengths of the pile produced within said field is correspondingly less. It will therefore be understood that, by means of the present improvement, there may be produced a fabric pile P which as illustrated in Fig. 4 of the drawings differs at intervals in length with a uniformity requisite in certain kinds of work and also that, when desired, the difference in the pile length may be changed within a definite field of pile length. Furthermore, the pile-length field may be itself changed by vertical adjustment of said T-bolt 34, whereupon by corresponding adjustments of the T-bolt 27, the knife has the same definite range of shiftable movement as before, but in a different field. It is of course obvious that the described adjustments also provide for resetting the knife in any desired position after the knife has been shortened by regrinding for sharpening purposes.

As in the machine of my prior patent application, Serial No. 447,174, the needle 9 is vertically reciprocated independently of the vertical movements of the feeding foot 18 and partakes of the lateral movements of

said foot. Furthermore, the feeding foot 18 rises and falls alternately with vertically reciprocatory movements of a presser-foot 43. It is to be understood, however, that the present invention, in its broader aspects, is not limited to any particular form of work-feeding mechanism or in fact to any particular type of pile-loop forming mechanism.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A fabric-pile forming machine comprising, loop-forming means, a loop-severing device cooperating with said loop-forming means in the severing of the formed loops, means for shifting the cooperative position of the loop-forming means and the loop-severing device from one point to another in a limited field to thereby effect the production of different lengths of severed loop-limbs constituting the fabric pile, means for adjustably limiting the range of effective action of said shifting means within said field to thereby predetermine the difference in the fabric-pile length, and adjustable means for changing the field of effective action of said shifting means.

2. A fabric-pile forming machine having a reciprocatory loop-forming implement, a loop-severing knife cooperating with the loop-forming implement to cut open the loops successively formed by said implement, a knife support including adjustable means for repositioning the knife in the direction of the path of travel of the loop-forming implement, a rotatable crank-arm carried by said knife-support, and an operative connection between said crank-arm and the knife for shifting said knife from one predetermined point to another in said direction of the path of travel of the loop-forming implement.

3. A fabric-pile forming machine having a reciprocatory loop-forming implement, a loop-severing knife cooperating with the loop-forming implement to cut open the loops successively formed by said implement, a knife support having a guideway confining said knife to movements upon the knife support in the direction of the path of reciprocation of said loop-forming implement, means for adjustably supporting the knife upon said knife support, and means including a rotatable cam for shifting the knife in the support guideway between spaced loop-severing positions to effect the production of different lengths of severed loop-limbs constituting the formed fabric-pile.

4. A fabric-pile forming machine having a reciprocatory loop-forming implement, a loop-severing knife cooperating with the loop-forming implement to cut open the loops successively formed by said implement, a knife support having a guideway confining said knife to movements upon the knife support in the direction of the path of reciprocation of said loop-forming implement, means for adjustably supporting the knife upon said knife-support, means for shifting the knife in the support guideway to effect the production of different lengths of severed loop-limbs constituting the formed fabric-pile, and adjustable means for predetermining the limits of shifting movements of said knife.

5. A fabric-pile forming machine having a reciprocatory loop-forming implement, a loop-severing knife cooperating with the loop-forming implement to cut open the loops successively formed by said implement, a knife-support, a rotary spindle adjustably mounted upon said support and operatively connected with said knife to shift the knife upon its support, means adjustably secured upon said support for limiting the extent of shifting movement of the knife effected by rotation of said spindle, and yielding-means for maintaining said knife in fixed position upon said support while coacting with the loop-forming implement to sever the formed loops.

6. A fabric-pile forming machine having a loop-severing knife, a slabbed loop-forming implement reciprocable across the cutting edge of said knife having its slabbed face disposed flatwise in sliding engagement with a face of said knife, a reciprocatory carrier for said implement including means permitting the implement to turn slightly about its longitudinal axis to accommodate flatwise engagement with said knife, and yielding means urging the loop-forming implement and the knife into sliding engagement with each other.

7. A fabric-pile forming machine comprising, a loop-forming implement having a prescribed path of movement, means for actuating said implement, a loop-severing knife cooperating with said loop-forming implement to sever the formed loops, a knife-support, a manually operable device for shifting said knife between spaced loop-severing positions upon said support, adjustable means for predetermining the loop-severing positions between which said knife may be shifted, and means yielding upon operation of said manually operated device for maintaining said knife in fixed position upon said support while coacting with said loop-forming implement.

In testimony whereof I have signed my name to this specification.

WALTER MYERS.