May 29, 1956 J. P. ENOS 2,747,533

THREAD-SEVERING DEVICES FOR SEWING MACHINES

Filed Oct. 29, 1951

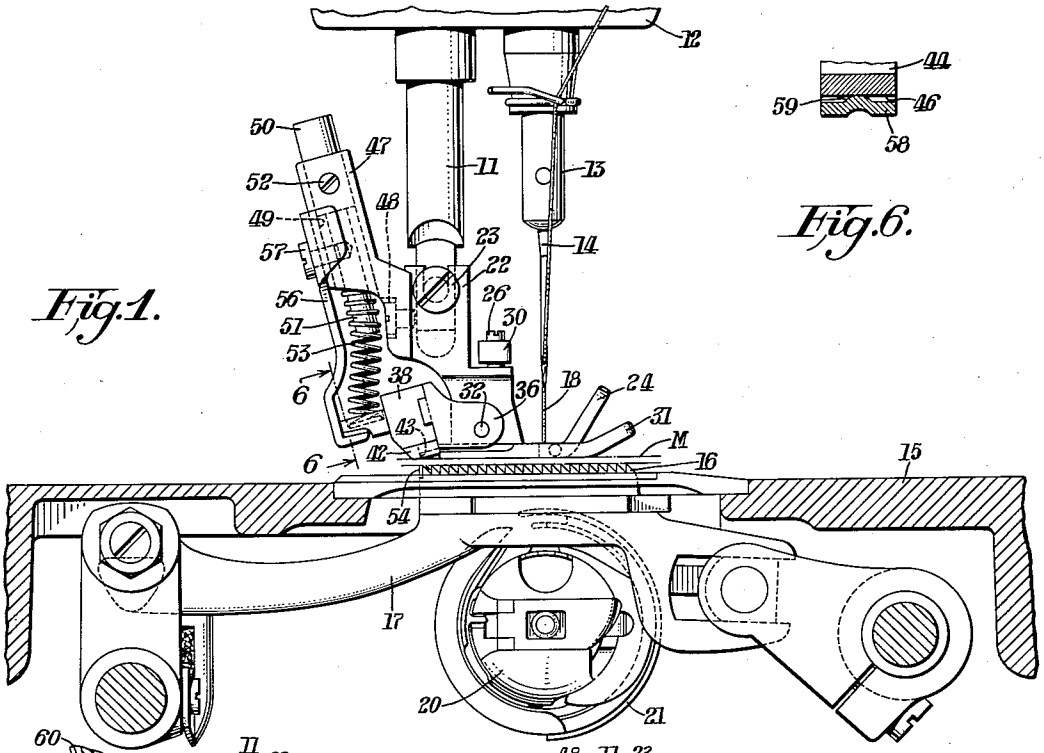


Fig. 1.

Fig. 6.

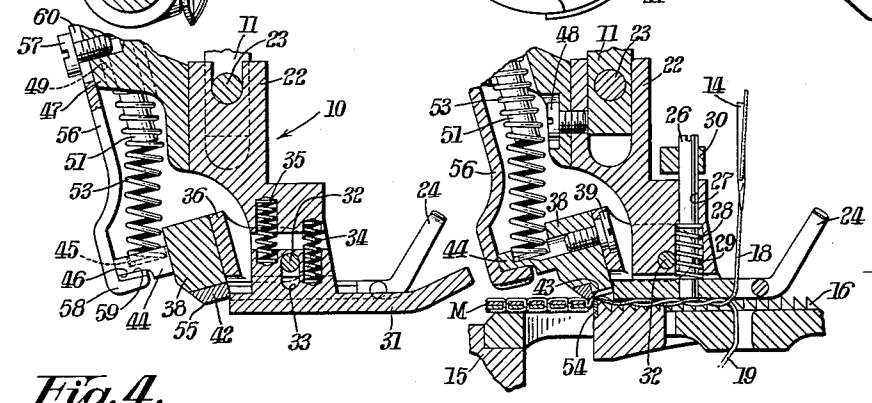


Fig. 4.

Fig. 5.

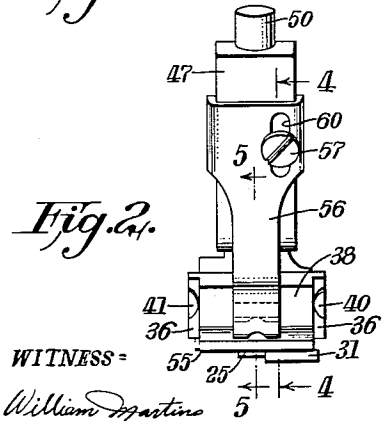


Fig. 2.

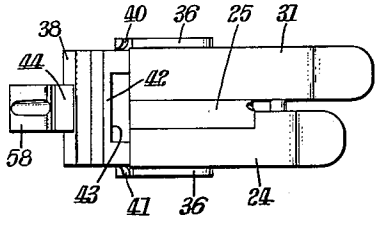


Fig. 3.

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United States Patent Office 2,747,533 Patented May 29, 1956

2,747,533

THREAD-SEVERING DEVICES FOR SEWING MACHINES

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Application October 29, 1951, Serial No. 253,623

4 Claims. (Cl. 112—252)

This invention relates to thread-severing devices for sewing machines and, more particularly, to thread severing devices adapted automatically to sever the stitching thread or threads between successively stitched articles.

An object of this invention is to provide a presser-foot with a cutter-element which will act in conjunction with a sewing machine feed-dog to sever the stitching thread between successively stitched articles.

Another object of the invention is to provide a presser-foot with a cutter which is self-aligning with a cutting edge on a sewing machine feed-dog.

A further object of the invention is to provide a stop for the cutter-element to limit its movement toward the sewing machine throat-plate.

A still further object of the invention is to provide an adjustment for the cutter-element stop.

In the drawings, Fig. 1 is a side view in elevation of the presser-foot installed in a sewing machine shown partly in section.

Fig. 2 is a rear view in elevation of the presser-foot.

Fig. 3 is a bottom view of the presser-foot.

Fig. 4 is an enlarged sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is an enlarged sectional view taken on line 5—5 of Fig. 2.

Fig. 6 is an enlarged sectional view of the cutter-element stop taken on line 6—6 of Fig. 1.

Referring more specifically to the drawings, a presser-foot 10 is shown attached to a presser-bar 11 carried by a conventional sewing machine head 12. A reciprocable needle-bar 13 is also carried by the head 12 and has attached thereto a sewing needle 14. The sewing needle 14 penetrates work material M passing beneath the presser-foot 10 and over a work support 15. The presser-foot 10 holds the work material M against the work support 15 to be engaged by a feed-dog 16 carried by a feed-bar 17. Stitching is formed in the material by a needle thread 18 carried by the needle 14 and a bobbin thread 19 carried in a bobbin case 20 in a loop taker 21.

The presser-foot 10 comprises a shank 22 which is attached to the presser-bar 11 by a clamping screw 23. One sole-plate 24 of the presser-foot is formed integral with the shank 22. A second sole-plate or chaining section 25 of the presser-foot is attached to a pin 26 which extends through a vertical hole 27 formed in the shank 22. A coil spring 28 encircles the lower end of the pin 26 and is disposed in a counterbore 29 in the bottom of the shank 22 coaxial with the hole 27. The spring 28 urges the chaining section 25 downwardly, but a stop-collar 30 fastened to the top of the pin 26 limits the downward travel of the pin 26. A pivoted sole-plate 31 is carried by the shank on a pivot pin 32 and a vertically elongated mounting hole 33 permits limited vertical motion of the pivoted sole-plate 31 with respect to the shank 22. A coil spring 34 placed in front of the pivot pin 32 and a coil spring 35 placed behind the pivot pin 32 normally hold the sole-plate in a horizontal position but will yield

to permit the sole plate to pivot about the pin 32 or to rise vertically with respect to the shank 22.

A thread-chain cutter-bar mounting bracket or carrier 36 is pivotally carried by the shank on the ends of the pin 32 at either side of the shank 22 and a thread-chain cutter-bar 38 is pivotally fastened to the bracket 36 by a pivot screw 39. Limit stops 40 and 41 formed on the mounting bracket 36 at either side of the cutter-bar 38 limit the amount of pivotal motion permitted the cutter bar about the pivot screw 39. The bottom portion of the cutter bar 38 is a hardened cutter blade 42 provided with a sharp cutting edge 43. The cutter-bar is formed with a rearwardly extending spring abutment 44 which is provided with a spring receiving socket 45 and a flat smooth lower surface 46. A spring retainer 47 is fastened to the shank 22 by a screw 48 and is provided with a hole 49 extending downwardly and toward the cutter-bar 38. A shouldered pin 50 formed with a pilot portion 51 of small diameter is fitted in the hole 49 and is held in adjusted position by a set screw 52. One end of a coil compression spring 53 bears against the shoulder of the pin 50, and the pilot portion 51 of the pin extends into the spring to guide it. The other end of the spring 53 is seated in the socket 45 in the spring abutment 44. The force applied to the cutter bar 38 by the spring 53 is varied by adjusting the position of the pin 50 in the spring retainer 47.

When the sewing machine is in operation, the presser-foot 10 engages the work material M in a conventional manner and presses it into engagement with the feed-dog 16. In the absence of work material between the presser-foot 10 and the feed-dog 16, as shown in Fig. 5, the feed-dog functions to advance the stitching threads 18 and 19, whereupon a sharp edged blade 54 fastened to the rear edge of the feed-dog 16 coacts with a sharp edge 43 of the cutting blade 42 to sever the threads. The cutter-bar 38 can pivot about the pivot screw 39 so that the cutting edge 43 of the cutter-bar is alined with the sharp edge of the blade 54 carried by the feed-dog 16. The rear edge 55 of the cutting blade 42 is lower than the cutting edge 43, but the pivotal connection between the mounting bracket 36 and the shank 22 permits the cutter bar 38 to rise sufficiently with the feed-dog 16 to prevent the breakage of any parts.

From the foregoing description, it will be apparent that if the downward movement of the cutter bar 38 is not limited, the rear edge 55 of the cutting blade will bear heavily on the work material M beneath the cutter-bar under the full force exerted by the spring 53. Each time the feed-dog 16 rises to engage the material, it will press the material into engagement with the read edge 55 of the cutter bar with a sharp blow. It may happen that the force of the blow is sufficient to form indentations in the work material or to rupture the material. To prevent the cutter blade 42 from bearing so heavily on the work material, an adjustable stop 56 is provided which is fastened to the spring retainer 47 by a screw 57. The lower end 58 of the stop is bent under the spring abutment 44 and is formed with a ridge 59 which engages the lower surface of the abutment 44. The ridge 59 is substantially parallel with the axis of the pivot screw 39 so that the abutment 44 engages the ridge 59 in a line contact. The line contact of the abutment 44 with the ridge 59 permits the cutter bar to pivot around the screw 39 in order to align the cutting edge 43 in the same horizontal plane with the sharp edge of the blade 54. The upper end of the stop 56 is provided with a slot 60 through which the fastening screw 57 passes. It should be noted that the cutter bar has a universal or self-aligning action due to its ability to pivot about the pivot pin 32 as well as the screw 39. Thus, if the feed-dog cutter blade 54 is not in a horizontal plane parallel with the cutting edge 43, the cutter-bar 38 can pivot around the pivot screw 39 until the cut-

ting elements are in parallel horizontal planes and the cutter bar can pivot upwardly and downwardly with the motion of the feed-dog **16**.

Before the sewing machine is placed in operation, the position of the stop **56** is carefully adjusted by loosening the fastening screw **57** and moving the stop **56** along the spring retainer **47** until the cutting edge **43** of the cutter blade **42** engages the feed-dog blade **54** only sufficiently to sever the stitching threads **18** and **19** when no work material is between the feed dog **16** and the presser-foot **10**. The fastening screw **57** is then tightened to hold the stop in position. When the stop **56** is adjusted in this position, the cutter bar **38** can only drop low enough to sever the threads and no further. When work material is placed between the presser-foot **16** and the feed-dog **10**, the rear edge **55** of the cutter blade **42** can press into the work material M only a small amount, which is not sufficient to damage the material. Further, the resiliency of the work material is sufficient to absorb the impact of the feed-dog **16** without any damage resulting from the slight anvil effect of the edge **55** of the cutter bar. When the stop **56** is properly adjusted, the finished article presents an unblemished surface which is free of indentations or ruptures. Of course, if the work material is particularly hard, the cutter blade may merely bear on the surface of the material and never form indentations in the material or permit the abutment **44** to engage the stop **56**. This does not, however, prevent the thread severing action from being effective.

From the above description, it is apparent that I have provided a presser-foot with a thread severing device which will not damage the work material and which may be easily installed on a sewing machine. Further, it will be apparent to those skilled in the art that the presser-foot will operate satisfactorily regardless of the number of stitch-forming threads which are used in the sewing machine.

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

1. In a sewing machine, a presser-bar, a work-support, a feed-dog extending through said work support and provided with a thread cutting blade, a presser-foot shank attached to said presser-bar, a sole plate carried by said shank, a cutter bar, means operatively connecting said cutter bar to said shank, said means including a plurality of pivotal connections having skewed pivotal axes, a stop having a ridge parallel to one of said axes engageable in line contact by said cutter bar to limit its motion about one of said axes, said stop being adjustable relative to said sole-plate, and a spring urging said cutter bar into engagement with said stop.

2. A sewing machine presser-foot comprising, a shank, a sole-plate carried by said shank, a thread-severing cutter-bar carrier, a primary pivotal connection between said shank and said carrier having a primary pivotal axis, a thread severing cutter-bar, a pivotal connection between said cutter-bar and said carrier having a secondary pivotal axis, said axes being askew relative to each other, and spring means engaging said cutter-bar to bias said cutter bar in one direction about said primary pivotal connection.

3. A sewing machine presser-foot comprising, a shank, a sole-plate carried by said shank, a thread-severing cutter-bar carrier, a primary pivotal connection between said shank and said carrier having a primary pivotal axis, a thread severing cutter-bar, a pivotal connection between said cutter-bar and said carrier having a secondary pivotal axis, said axes being askew relative to each other, a stop engageable in line contact with said cutter-bar to limit its pivotal motion about one of said axes, and a spring engaging said cutter-bar and urging it into engagement with said stop.

4. A sewing machine presser-foot comprising, a shank, a sole plate carried by said shank, a thread severing cutter-bar carrier, a primary pivotal connection between said shank and said carrier having a primary pivotal axis, a thread severing cutter-bar, a secondary pivotal connection between said cutter-bar and said carrier having a secondary pivotal axis, the distance between said axes varying throughout their length, a cutter-bar stop spaced from said sole plate, and spring means engaging said cutter-bar and urging said cutter-bar toward said stop.

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