

Dec. 12, 1939.

E. QUINN

2,183,170

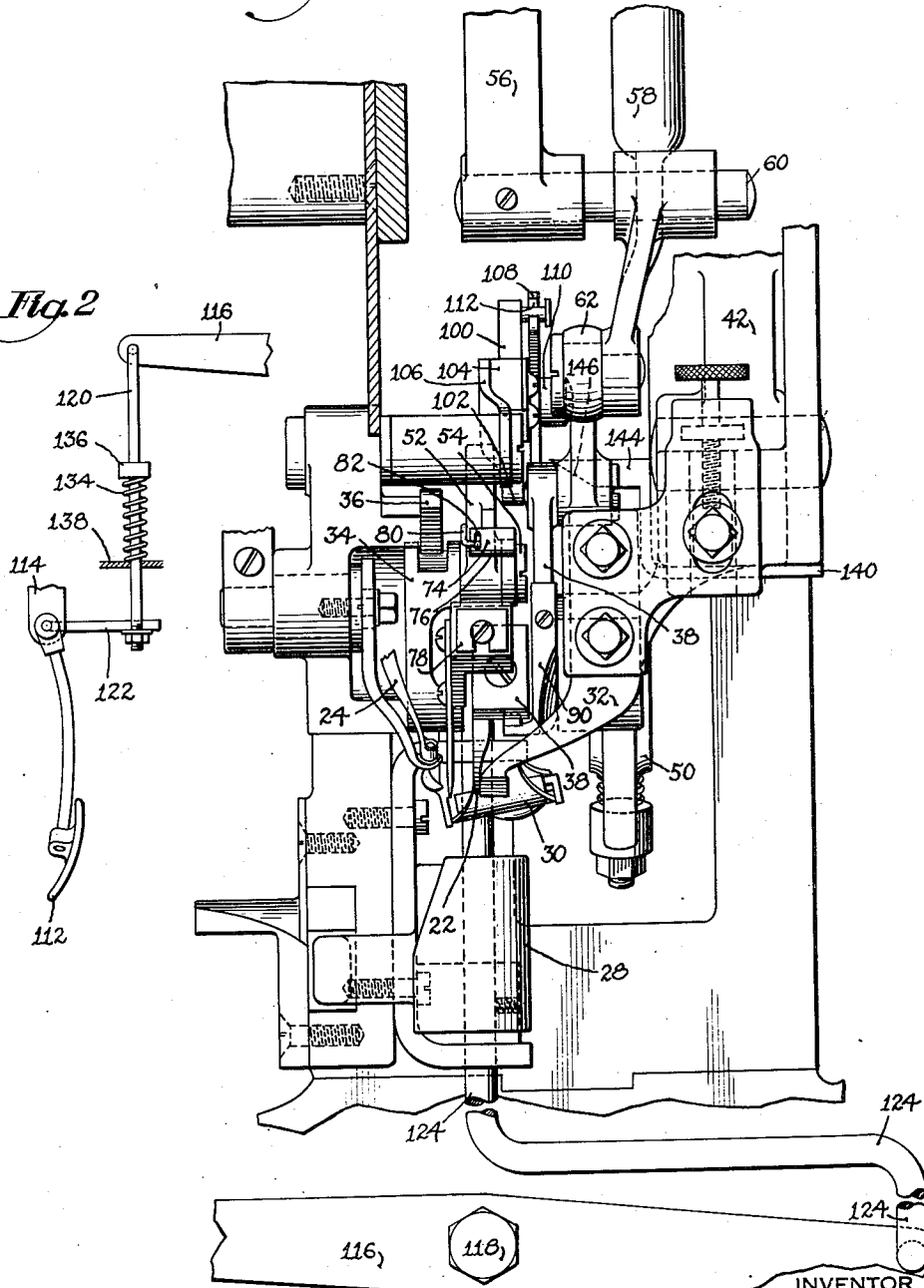
MACHINE FOR OPERATING ON SHOES

Filed July 25, 1936

5 Sheets-Sheet 1

*Fig. 1*

*Fig. 2*



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MACHINE FOR OPERATING ON SHOES

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5 Sheets-Sheet 2

Fig. 3

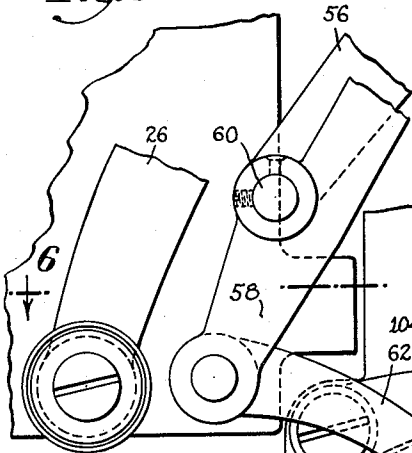


Fig. 5

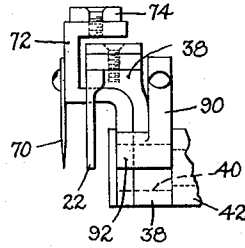
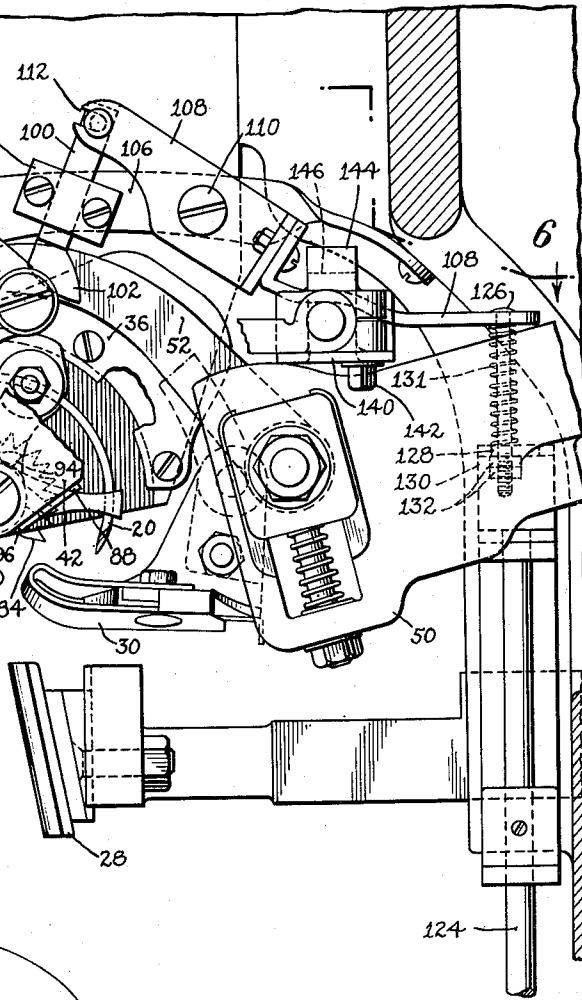
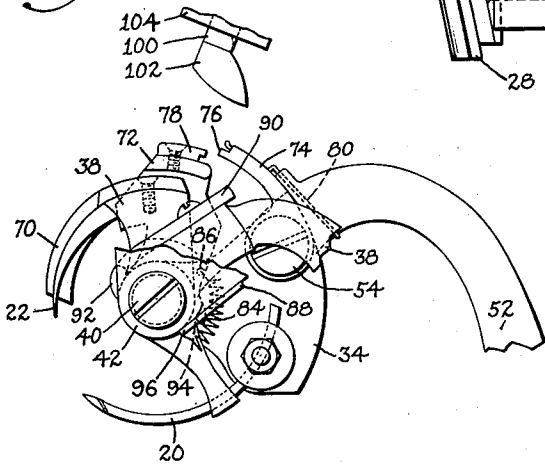


Fig. 4



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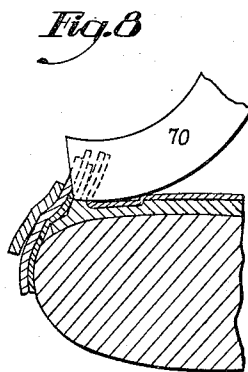
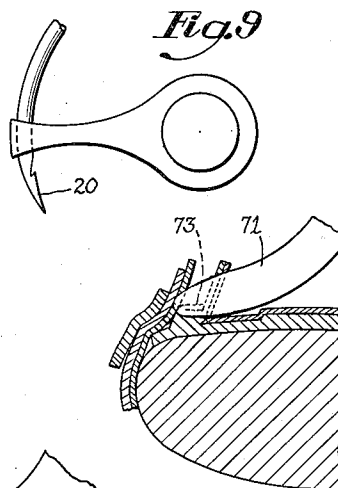
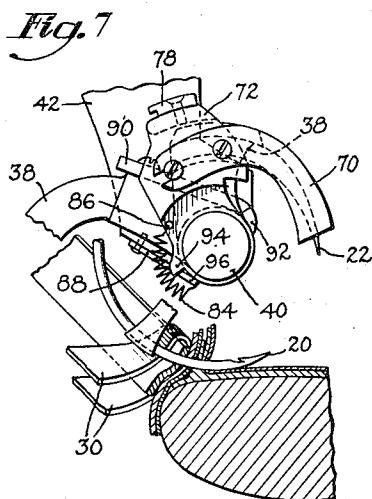
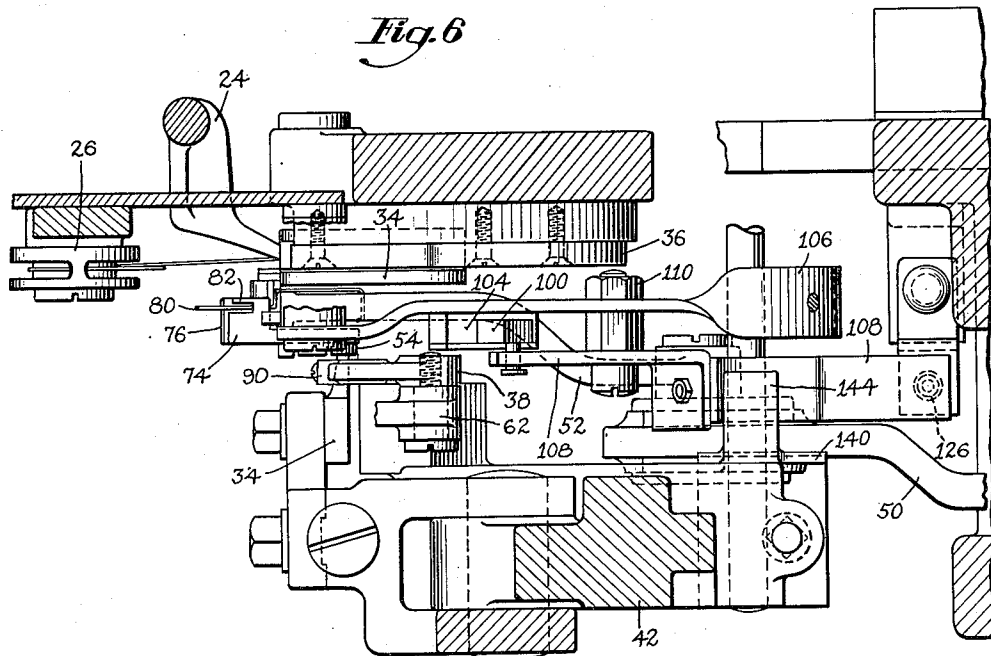
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MACHINE FOR OPERATING ON SHOES

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5 Sheets-Sheet 3



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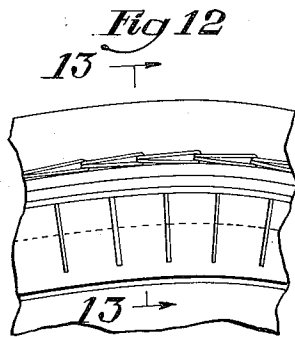
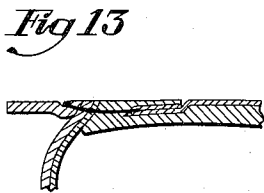
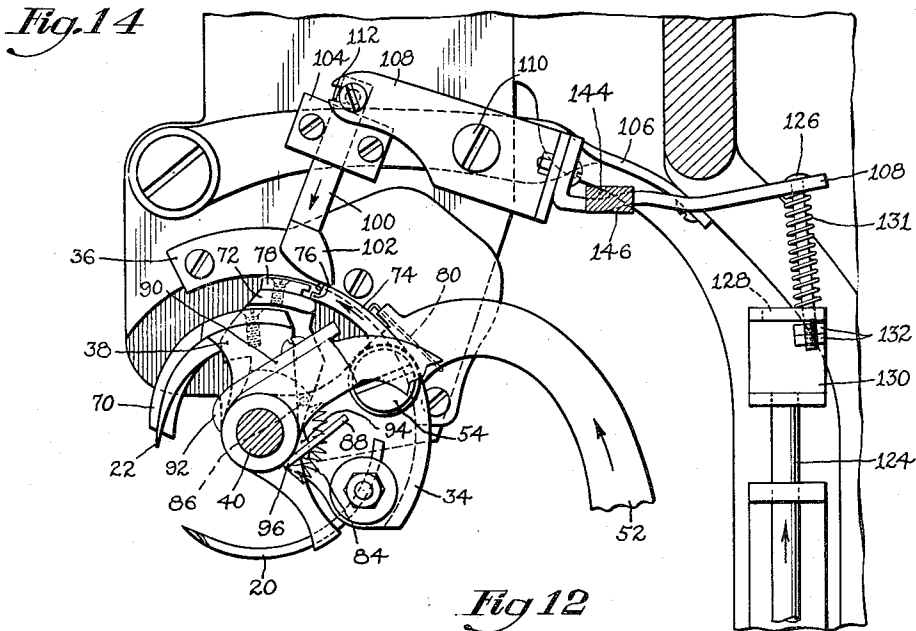
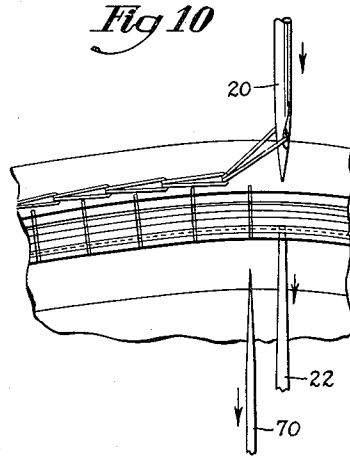
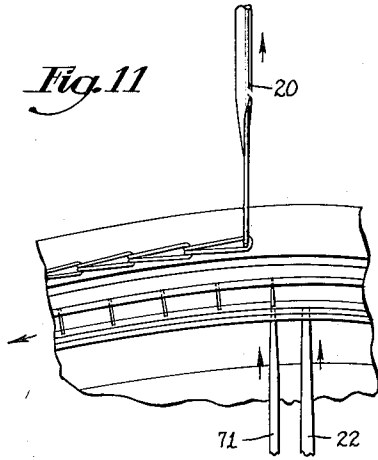
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MACHINE FOR OPERATING ON SHOES

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5 Sheets-Sheet 4



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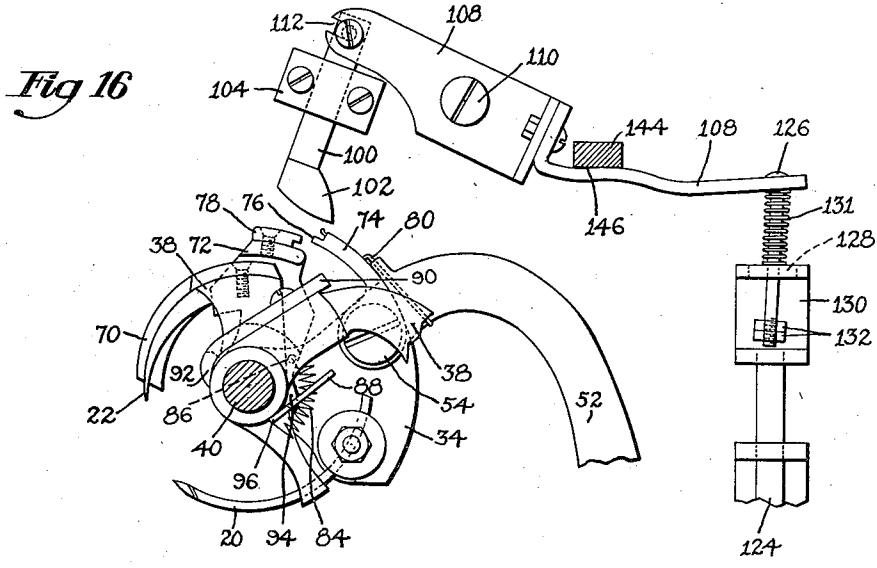
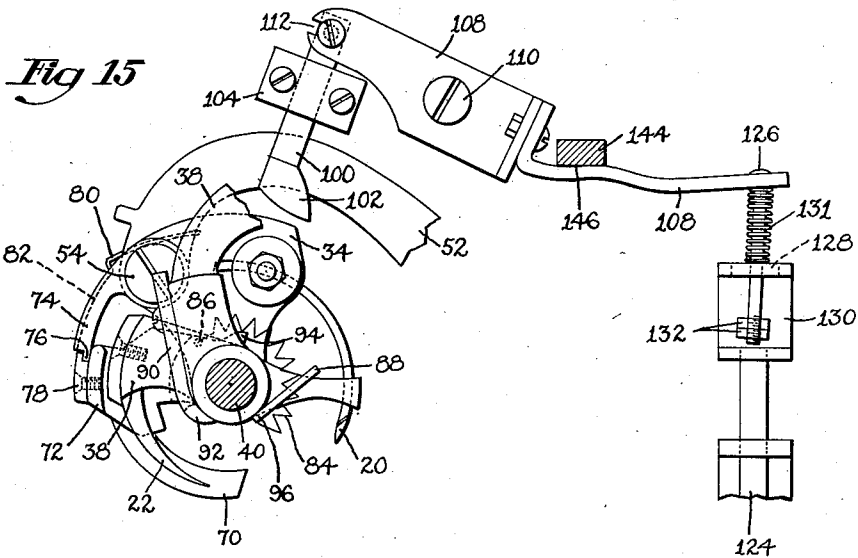
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MACHINE FOR OPERATING ON SHOES

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5 Sheets-Sheet 5



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# UNITED STATES PATENT OFFICE

2,183,170

## MACHINE FOR OPERATING ON SHOES

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Application July 25, 1936, Serial No. 92,587

28 Claims. (Cl. 112—35)

The present invention relates to improvements in shoe machines, and more specifically to the provision in an inseam sewing machine, of a device for slashing the sewing rib of the sole, it being understood that the term "sewing rib" is used in the following description and in the claims to define that portion of the sole located between the oppositely disposed stretches of thread forming the stitches of the seam.

In the manufacture of shoes of the general type to be operated upon by an inseam sewing machine, that is, in which the upper or the upper and welt as the case may be, are attached to the shoe sole by means of a line of stitching which passes through a sewing rib formed adjacent the margin of the shoe sole, it has been found that the relatively heavy sewing rib necessary for the formation of a strong seam, acts as a stiffening element in the sole of the finished shoe, which has thus far balked attempts to produce lighter and more supple shoes of this preferred construction.

It is a principal object of the present invention to provide in an inseam sewing machine, a device for slashing the sewing rib of the sole, in such a manner as to increase the flexibility of the shoe sole without at the same time causing injury to or weakening the finished seam.

More specifically, it is an object of the invention to form a slashing cut in the sewing rib which extends downwardly into the between-substance or that part of the sewing rib through which the stitches pass, and thereby to form a series of substantially separate segments of the sewing rib which are held together at the base portion thereof by the stitches of the seam.

It is a further object of the present invention to provide a slashing device of this general description which is well adapted for use in a welt sewing machine as exemplified for instance in the patent to Eppler, No. 1,108,560, dated August 25, 1914, for sewing together the welt, insole and associated upper of a shoe supported on a last.

With these and other objects in view as may hereinafter appear, one feature of the invention consists in the provision of a knife which is arranged to slash the between-substance of the sewing rib, making a cut which extends transversely of the line of stitching, and which is spaced between the portions of successive stitches passing through the work.

Another feature of the invention consists in the provision of a supporting and actuating mechanism for applicant's slashing knife which operates in combination with the curved needle, awl and feed slide of the machine herein described, to cut through the sewing rib at a point in the line of feed between the awl as it advances to engage the work, and the needle as it is with-

drawn to draw in the last completed stitch of the seam.

The several features of the invention consist also in the devices, combinations and arrangement of parts hereinafter described and claimed, which together with the advantages to be obtained thereby will be readily understood by one skilled in the art from the following description taken in connection with the accompanying drawings, in which Fig. 1 is a view in front elevation of a portion of the sewing head of a welt sewing machine, only so much of the machine being shown as is deemed necessary to show the connection of the present invention therewith; Fig. 2 is a somewhat diagrammatic view in front elevation of the knee control for the slashing device, the parts illustrated forming a continuation of the chain of connections illustrated in Fig. 1; Fig. 3 is a view in right side elevation of substantially the parts shown in Fig. 1, with the machine in stop position and with the slashing knife disconnected; Fig. 4 is a detail view in right side elevation showing a relative position of the needle, awl and knife with the needle fully advanced through the work, and with the awl and knife segments fully retracted; Fig. 5 is a detail view in front elevation of the awl and knife segments in the position shown in Fig. 4; Fig. 6 is a sectional plan view taken on the line 6—6 of Fig. 3; Fig. 7 is a detail view in left side elevation, of the needle, awl and knife in the position corresponding to that shown in Fig. 4; Fig. 8 is a detail view partly in section illustrating the operation of one form of knife to slash the sewing rib; Fig. 9 is a detail sectional view similar to Fig. 8, showing the operation of a different form of knife to slash the between-substance of the sewing rib without completely splitting the channel lip; Fig. 10 is a detail plan view showing a portion of the finished seam and the slashing cuts formed by the knife illustrated in Fig. 8, at a point in the operation of the needle, awl and knife in which the work has been fed and the needle is advancing toward the work; Fig. 11 is a detail plan view illustrating a portion of the completed seam and the slashing cuts formed by the knife illustrated in Fig. 9, in which the awl and knife have been advanced to the limit of their advancing movement prior to the feeding of the work; Fig. 12 is a plan view of the seam illustrated in Fig. 11, with the channel flap returned to a flat position in the channel groove; Fig. 13 is a sectional view taken on the line 13—13 of Fig. 12; Fig. 14 is a view in right side elevation of certain operating parts including the mechanism for controlling the operation of the slashing knife with the needle at the limit of its movement through the work, and the latch depressed into operating position by the downward movement of the latch control plunger; and Figs. 60

15 and 16 are views substantially similar to Fig. 14, showing different positions of the parts, Fig. 15 showing the knife forced to its fully advanced position to slash the sewing rib subsequent to the engagement of the latch with the knife segment, and Fig. 16 showing the knife again returned to its fully retracted position as the needle is advanced through the work and the latch again disengaged as the latch control plunger is momentarily lifted by the advance of the feed slide.

The machine disclosed in the drawings as illustrating in a preferred form the several features of the present invention, comprises a welt sewing machine for attaching the welt to the insole and associated upper, and is substantially identical in its construction and mode of operation with the machine disclosed in the patent to Eppler No. 1,108,560. The shoe operating devices of the machine include a curved hook needle 20, an awl 22, a looper 24, a take-up 26, work supporting devices including a back rest 28, a welt guide 30 which acts also as an edge support, and a channel guide 32. In accordance with the usual construction of these machines, the needle 20 is carried on a needle segment 34 mounted on a stationary pivot and being externally supported in a raceway 36 on the machine frame. The awl 22 is carried on an awl segment 38 pivoted on a stud 40 in alignment with the axis of rotation of the needle and needle segment 34. For feeding the work, a feed slide is provided which is reciprocated in the line of feed, and provides a support for the pin 40 carrying the awl 22, and also for the channel guide 32.

The needle segment is actuated from a reciprocable needle lever generally indicated at 50 in Fig. 3, which is connected by means of a curved link 52 to a pivot pin 54 on the needle segment. The awl is driven through connections including a cam actuated lever 56, an awl lever 58 which is connected by means of a pivot pin 60 intermediate its length to the cam lever 56, and at its lower end is connected by a link 62 to the awl segment 38. The awl actuating lever 58 is connected at its upper end to move in the line of feed with the feed slide 42, being arranged to slide axially on the pivot 60.

The mode of operation and timing of the several cooperating elements thus far described, is well known in the art, being more particularly described in the Eppler patent above referred to, but may be briefly outlined as follows in order to establish more clearly the relation of the present invention thereto.

The feed slide carrying with it the retracted awl 22 and channel guide 32, is back fed prior to and during the retracting movement of the needle. The channel guide is then permitted to clamp the work against the welt guide 30 and back rest 28, the awl is advanced to engage the work, and the feed slide is then advanced to feed the work, so that the awl is brought into alignment with the needle which is now advanced through the work to pick up a new loop of thread. As the needle advances, the awl is retracted preparatory for the following back feeding movement of the feed slide.

In accordance with the present invention, a slashing knife is provided which is constructed and arranged to make a slashing cut in the sewing rib of the insole which extends downwardly into the between-substance, defined as that part of the material forming the sewing rib through which the stitches are drawn. The cut thus formed extends transversely of and is spaced be-

tween the perforations made by the needle and awl, so that the sewing rib is cut into a series of substantially separate segments which are held together at their base by the successive stitches of the seam. In the finished shoe as ordinarily constructed, the relatively heavy sewing rib operates as an undesirable stiffening element to reduce the flexibility of the shoe sole. It has been found moreover that the flexing of the sewing rib operates to expand and contract the seam longitudinally of the sole, with a resultant tendency to a loosening of the seam. The slashing of the rib in accordance with applicant's invention, serves to markedly increase the flexibility of the shoe when in use. It will be seen also that by the use of applicant's slashing knife, an entirely new relationship is secured between the stitches of the seam and the work secured thereby. In addition to the usual function of the stitching to hold the associated parts of the shoe together, the stitches in the present instance, operate when the shoe is flexed, to hold together the separate segments of the slashed rib, so that the stitches tend always to be stretched longitudinally and are thus pulled still more tightly into the work to insure the maintenance of a tight bond or union between the associated sole and the upper portions of the shoe.

The slashing knife herein disclosed, and the supporting and actuating connections therefor, are constructed with particular reference to their use in a welt sewing machine of the general type herein disclosed. In the preferred construction illustrated, the knife is supported co-axially with the awl upon the feed slide to move in a curved path transversely of the line of feed, and is spaced from the awl toward the completed stitches of the seam about one-half a stitch length, so that each successive cut made by the knife will be properly placed with relation to the succeeding stitches of the seam. Further, in accordance with the invention, the knife is constructed and arranged to operate in the line of feed in advance of the needle, that is, on the side of the needle remote from the completed stitches of the seam, so that there may be no danger of interference with or severing of the sewing thread by the knife, and also so that the stitch may be set against the work after the cut has been made to insure the formation of a tight stitch which will operate both to bind together the successive segments of the slashed sewing rib, and at the same time to draw tightly together the associated sole and upper portions of the shoe.

In operation, the knife 70 is arranged to move in a curved path which extends to the bottom of the channel groove and passes through the sewing rib including the between-substance substantially at the base of the rib. In a preferred form of the invention, as best shown in Figs. 8 and 10, the knife is provided with a relatively wide cutting edge which operates to completely sever the channel lip and the sewing rib in a slashing cut which extends downwardly across the line of stitching to form a series of substantially separate segments of the sewing rib which are later bound together by the stitches of the seam.

Figs. 9 and 11 to 13 inclusive, illustrate a modified form of slashing knife 71 having a relatively narrow blade for slashing the between-substance comprising the sewing rib of a specific form of insole, in which the shouldered portion of the insole is bent back as indicated in dotted lines at 73 (Fig. 9), and in which the channel lip is subsequently re-laid in its initial position to cover

the stitches of the seam (see Figs. 12 and 13). With this modified form of slashing knife, a slit is formed in the channel lip which, however, does not extend to the edge thereof, so that the lip may be later re-laid in its initial position still in the form of a single strip.

As shown in the drawings, the slashing knife 70 is carried on a knife segment 72 which, as best shown in Fig. 5, is loosely sleeved to turn on the hub portion of the awl segments 38, so that the knife oscillates about the same axis as the needle and awl and between them.

In the preferred form of the invention disclosed, the knife 70 is actuated in timed relation to the needle and awl movements through connections which are operated directly by the movements of the needle and awl. The knife is advanced to slash the sewing rib by the retracting movement of the needle segment 34 by means of a latch 74 which is carried on the pivot stud 54 connecting the link 52 to the needle segment 34. The latch 74 is provided at its outer end with a lip 76 which is arranged for locking engagement with an undercut plate 78 rigidly secured to the peripheral surface of the knife segment 72. A small spring 80 mounted in a slot 82 in the latch 74 and secured at its rear end to the needle actuating link 52, tends normally to maintain the latch in a raised inoperative position.

Assuming an operating condition of the machine, in which the slashing mechanism is inoperative and the latch 74 free to move upwardly under the influence of its spring 80 as shown in Fig. 4, the retracting movement of the needle 20 and needle segment 34 will cause the latch 74 to ride over the plate 78. As the needle segment 34 continues its retracting movement, the pivot pin 54 will engage with the rear side of the knife segment 72, imparting a dummy motion thereto, as shown in Fig. 3, which, however, is not sufficient to bring the knife 70 into contact with the work.

For retracting the knife, a tension spring 84 is connected at one end to an eye 86 formed in the rear side of the knife segment 72, and at its other end to an L shaped plate 88 secured to the portion of the feed slide 42 which forms the bearing for the pivot pin 40. In order to insure the retracting of the knife with the awl and thereby to prevent possible interference with the subsequent operation of the looper and needle, an L shaped member 90 having a lateral extension 92 is provided on the awl segment 38, which operates during the retracting movement of the awl to engage against the knife segment 72, and thereby to positively retract the knife. An abutment 94 formed on the rear side of the knife segment 72 is arranged for engagement with a laterally extending arm 96 of the stop plate 88 to positively limit the retracting movement of the knife 70 and segment 72, so that the latch 74 will always be disengaged from the locking member 78 as the needle reaches the limit of its advancing movement through the work, as illustrated, for example, in Fig. 4, thus leaving the latch free to be disconnected from the knife segment 72 under the influence of its spring 80 during the formation of the next succeeding stitch.

In order to control the position of the latch 74, there is provided with the present construction, a latch presser member or plunger 100 which carries at its lower end a latch engaging foot 102 and is slidably mounted in a bracket 104 secured to a supporting member 106 fastened to the ma-

chine frame. The plunger 100 is connected by a pin and slot connection to the forward end of a control lever 108 pivotally supported on a stud 110 on the stationary bracket 106. The operation of the control lever 108 and the plunger 100 connected thereto, is controlled from a knee treadle 112 (see Fig. 2) which is pivotally supported on a stationary bracket 114, through connections (see Figs. 1, 2 and 3) which include a horizontally extending lever 116 supported intermediate its length on a stationary pivot 118, a vertically extending link 120 connected at one end of the lever 116, and at its other end to a laterally extending arm 122 secured to turn with the treadle member 112, and a vertically movable rod 124 having the lower end thereof laterally offset to connect with the other end of the lever 116. A yielding spring connection is provided between the upper end of the rod 124 and the control lever 108 which comprises a pin 126 mounted on the rearwardly extending arm of the lever 108, and arranged to extend downwardly through a slot 128 formed in a U-shaped plate 130 on the upper end of the rod 124. A compression spring 131 coiled about the pin 126, engages at one end against the lever 108 and at its other end against the plate 130 to maintain the rear end of the control lever yieldingly in a raised position which is adjustably determined by the engagement of two locking nuts 132, screw-threaded to the pin 126, with the inner surface of the U-shaped plate 130. The treadle member 112 is normally maintained in an inoperative position to the right as viewed in Fig. 2, and with the plunger 100 correspondingly retracted, by means of a compression spring 134 coiled about the link 120 between a collar 136 secured to the link, and a stationary plate 138 through which the link is arranged to pass.

In order to avoid interference of the latch actuating plunger 100 with the needle segment 34 and pivot pin 54 during the latter portion of the retracting stroke of the needle, a mechanism is provided which operates during each advancing movement of the feed slide to positively move the control lever 108 against the pressure of the spring 131 to lift the feed plunger 100 and latch engaging foot 102 out of the path of the needle segment. To this end, a bracket 140 is secured by means of a bolt 142 to a portion of the feed slide 42 as best shown in Figs. 1 and 3. The bracket 140 is in the form of an angle iron provided at its free end with a laterally extending arm 144 having formed thereon a cam surface 146 which is arranged to engage with and depress the rearwardly extending arm of the control lever 108.

This mechanism for positively retracting the plunger 100 and foot 102 to inoperative position with each advancing movement of the feed slide, operates also as a safety device to prevent an inadvertent actuation of the latch by the knee treadle during the time that the machine is reversed and the needle withdrawn from the work in stopping which would otherwise, due to the variation in the timing of the operating mechanisms, result in interference and damage to the machine.

The operation of the slashing mechanism is as follows:—When the knee treadle 112 is moved to the left by the operator to place the slashing mechanism in operation, the upward movement of the control rod 124 operates to compress the spring 131, and thus tends to rock the control lever 108 in a counterclockwise direction and to depress the plunger 100 and foot 102 into operative en-

gagement with the latch 74. This downward movement of the plunger 100 is permitted only as the feed slide 42 is back fed to the right from the position shown in Fig. 1, which causes the cam surface 146 to ride out of engagement with and release the control lever 108. The timing of the several cooperating mechanisms is such that during the back feed of the feed slide, the needle 20 is advancing to the limit of its movement through the work, so that the foot 102 of the plunger 100 is brought into engagement with and depresses the latch 74 at the beginning of the retracting movement of the needle. The position of the parts at this point in the operation, is illustrated in Fig. 14. The knife segment 72 is held at the limit of its retracting movement in which the abutment 94 is engaged with the L-shaped stop plate 88, and the latch member 74 due to the advance of the needle 20 and needle segment 34 is located to the rear of the locking member 78. As the needle segment 34 is now rocked to retract the needle 20 from the work, the corresponding advancing movement of the latch 74, now held in a fully depressed position against the pressure of its spring 80 by engagement of the foot 102, is brought into locking engagement with the member 78, thus connecting the knife segment 72 and knife 70 to be advanced to form a slashing cut in the work as the needle segment 34 and needle 20 are brought to the limit of their retracting movement. At the same time, the advance of the feed slide to feed the work, operates to engage the cam surface 146 with the control lever 108 to lift the plunger 100 and foot 102 out of the path of the needle segment 34 and pivot pin 54 against the compression of the spring 131. The position of the parts at the point in which the knife has been advanced to its fully advanced position to slash the sewing rib, is illustrated in Fig. 15. As the needle is again advanced through the work, the knife is retracted by the action of its spring 84, or positively with the awl by the engagement of the laterally projecting end 92 of the L-shaped stop member 90 with the knife segment 72. The resulting position of the parts is illustrated by Fig. 16, in which the knife segment is held in its fully retracted position under the influence of the spring 84, and the latch 74 is again disconnected by the continued advancing movement of the needle 20 and the needle segment 34. So long as the knee treadle 112 is maintained in its operative position by the operator, the above cycle of operations will be repeated, the advancing movement of the needle through the work operating to disconnect the latch 74 which is again brought into locking engagement with the member 78 by the downward movement of the plunger 100 and foot 102 as the needle again starts its retracting movement. When the treadle lever 112 is again released by the operator to terminate the slashing operation, it will be seen that the downward movement of the control rod 124 under the influence of the spring 134 will operate to lift the plunger 100 and foot 102 to the raised inoperative position illustrated in Fig. 1, so that when the needle is again advanced through the work, the latch member 74 disconnected from the locking member 78, as above described, can move upwardly under the pressure of its spring 80 to disconnect the knife from active operation.

The invention having been described, what is claimed is:

1. An in-seam shoe sewing machine having, in combination, stitch forming devices, means for slashing the sewing rib of the sole of a shoe presented to said devices, and means for rendering

the slashing means operative and inoperative during continued operation of the machine in sewing a seam.

2. An in-seam shoe sewing machine having, in combination, stitch forming devices, means for slashing the sewing rib of the sole of a shoe presented to said devices, a treadle and suitable connections for throwing said slashing means into and out of operation.

3. An in-seam shoe sewing machine having, in combination, stitch forming devices, a slashing knife with which to slash the sewing rib of the sole of a shoe presented to said devices, means for actuating said knife in timed relation to the stitch forming devices, and means for rendering the knife actuating means operative and inoperative during continued operation of the machine in sewing a seam.

4. An in-seam shoe sewing machine having, in combination, stitch forming devices, a knife for slashing the sewing rib of the sole of a shoe presented to said devices, means for actuating said knife in timed relation to the stitch forming devices, a treadle, and connections therefrom for throwing the knife into and out of operation during the continued operation of the machine in sewing a seam.

5. An in-seam shoe sewing machine having, in combination, stitch forming devices and means for slashing the sewing rib of the sole of a shoe presented to said devices to form a series of slashing cuts passing through the sewing rib from one side to the other whereby the thickness of the undivided stock comprised by the sole margin including said rib is reduced.

6. An in-seam shoe sewing machine having, in combination, stitch forming devices, and means disposed in such relation to and operative in timed relation to the stitch forming devices for forming a series of slashing cuts passing transversely through the sewing rib of the sole of a shoe presented to said devices from one side to the other.

7. An in-seam shoe sewing machine having, in combination, stitch forming devices, and slashing means for forming slashing cuts extending through the sewing rib including the between-substance of the sole of a shoe presented to said devices to form substantially separate segments of the sewing rib held together by the stitching.

8. An in-seam shoe sewing machine having, in combination, work piercing and stitch forming devices, and means for forming in the sewing rib of the sole of a shoe presented to said devices a series of slashing cuts spaced between the stitch receiving perforations.

9. An in-seam shoe sewing machine having, in combination, work piercing and stitch forming devices, and means for forming in the sewing rib of the sole of a shoe presented to said devices a series of slashing cuts non-intersecting with the stitch receiving perforations.

10. An in-seam shoe sewing machine having, in combination, work piercing and stitch forming devices, a slashing knife arranged to slash the sewing rib of the sole of a shoe presented to said devices, and supporting and actuating means for the knife actuable in timed relation to the stitch forming devices, for forming in the sewing rib a series of slashing cuts non-intersecting with the stitch receiving perforations.

11. An in-seam shoe sewing machine having, in combination, stitch forming devices, a slashing knife constructed and arranged to form a slashing cut transversely to the line of stitching and

passing through the rib of the insole of a shoe presented to said devices including the channel lip and the between-substance and supporting and actuating means for the knife.

5 12. An in-seam shoe sewing machine adapted for sewing together an upper and an insole having the shouldered edge portion of the sole laid back and a channel lip raised to form the sewing rib, the combination of stitch forming devices  
10 and a slashing knife constructed and arranged to pass through a portion of the raised channel lip adjacent the base thereof and to form a slashing cut in the laid over shouldered edge and the between-substance of the sewing rib between  
15 adjacent portions of the stitching passing through the between-substance.

13. An in-seam shoe sewing machine having, in combination, stitch forming devices, and means for forming a slashing cut in the sewing rib including the between-substance of the sole of a shoe presented to said devices transversely of the line of stitching and between adjacent portions of the stitching passing through the between-substance.

25 14. An in-seam shoe sewing machine having, in combination, stitch forming devices, a slashing knife constructed and arranged to form slashing cuts in the sewing rib including the between-substance of the sole of a shoe presented to said devices located between adjacent portions of the stitching passing through the between-substance, and means for actuating said knife in timed relation to the stitch forming devices.

30 15. An in-seam shoe sewing machine having, in combination, stitch forming devices, a knife for forming slashing cuts located between adjacent portions of the stitching passing through the sewing rib of the sole of a shoe presented to said devices, said cuts extending through the between-substance to form substantially separate segments of the sewing rib, and supporting and actuating means for said knife constructed and arranged to slash the sewing rib in advance of the operation of the stitch forming devices in the line of feed.

45 16. An in-seam shoe sewing machine having, in combination, stitch forming and work feeding devices including a needle, a knife for forming a slashing cut in the sewing rib of the sole of a shoe presented to said devices less than a stitch length from the side of the needle remote from the completed stitches of the seam, and means for actuating the knife in timed relation to the stitch forming and work feeding devices.

50 17. An in-seam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming and work feeding devices including a curved needle, a cooperating awl arranged to enter the channel of the insole and movable in the line of feed to feed the work, a slashing knife constructed and arranged to slash the sewing rib of the insole, means for supporting the knife to move with the awl in the line of feed,  
65 and means for actuating the knife in timed relation to the stitch forming and work feeding devices to form a slashing cut in the sewing rib less than a stitch length from the side of the needle remote from the completed stitches of the seam.

70 18. An in-seam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle  
75 arranged to enter the outside of the work, a co-

operating awl arranged to enter the channel, a feed support for the awl, a knife for slashing the sewing rib of the sole, a knife segment carried on the feed support for imparting an arcuate movement to the knife against the channel side of the rib, means controlled by the retracting movement of the needle to advance the knife, and means controlled by the retracting movement of the awl to retract the knife.

10 19. An in-seam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the shoe, a cooperating awl arranged to enter the channel of the insole, a knife for slashing the sewing rib of the insole supported co-axially with the awl and spaced therefrom less than a stitch length toward the completed stitches of the seam, means for imparting feeding movements to the awl and knife in spaced relation, and means for reciprocating said knife in timed relation to the sewing and feeding devices prior to the advance of the needle to form the next  
25 stitch.

20. An in-seam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the channel of the insole, a needle segment pivotally supported on a stationary portion of the machine, an oscillatory awl segment, a feed support for the awl segment, a knife for slashing the sewing rib spaced from the awl less than a stitch length toward the completed stitches of the seam, a knife segment carried on said pivotal feed support, a latch for actuating the knife segment from the needle segment, and means for controlling the latch to cause the needle segment during its retracting movement to advance the knife.

35 21. An in-seam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the channel of the insole, a needle segment pivotally supported on a stationary portion of the machine, an awl segment, a feed support for the awl segment, a knife for slashing the sewing rib of the insole spaced from the awl less than a stitch length toward the completed stitches of the seam, a knife segment pivotally carried on the feed support co-axially with the awl segment, a latch pivoted on the needle segment to engage the knife segment, and means for controlling the latch to engage with and advance the knife to slash the sewing rib during the retracting movement of the needle segment.

45 22. An in-seam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved  
65 needle arranged to enter the outside of the work, a cooperating awl arranged to enter the channel of the insole, a needle segment pivotally supported on a stationary portion of the machine, an awl segment, a feed support for the awl segment, a knife for slashing the sewing rib of the insole spaced from the awl less than a stitch length toward the completed stitches of the seam, a knife segment pivotally carried on the feed support co-axially with the awl segment, a latch  
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pivoted on the needle segment to engage the knife segment, spring means for moving the latch to an inoperative position, a latch control member, and means for actuating the latch control member to engage the latch with the knife segment during the retracting movement of the needle.

23. An inseam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the channel of the insole, a needle segment pivotally supported on a stationary portion of the machine, an awl segment, a feed support for the awl segment, a knife for slashing the sewing rib of the insole spaced from the awl less than a stitch length toward the completed stitches of the seam, a knife segment pivotally carried on the feed support co-axially with the awl segment, a latch pivoted on the needle segment to engage the knife segment, spring means for moving the latch to an inoperative position, a latch control member, means for actuating the latch control member to engage the latch with the knife segment during the retracting movement of the needle, and means rendered operative by the feed movement of the feed support to positively move the latch control member to inoperative position.

24. An inseam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the channel of the insole, a needle segment pivotally supported on a stationary portion of the machine, an awl segment, a feed support for the awl segment, a knife for slashing the sewing rib of the insole spaced from the awl less than a stitch length toward the completed stitches of the seam, a knife segment pivotally carried on the feed support co-axially with the awl segment, a latch pivoted on the needle segment to engage the knife segment, spring means for moving the latch to an inoperative position, a latch control member, a manually operable control and connections therefrom for actuating the latch control member including a yielding spring connection, and means rendered operative by the feed movement of the feed support to positively move the latch control member to inoperative position.

25. An inseam shoe sewing machine for sewing the upper to the rib of the insole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the channel of the insole, a needle segment pivotally supported on a stationary portion of the machine, an awl segment, a feed support for the awl segment, a knife for slashing the sewing rib of the insole spaced from the awl less than a stitch length toward the completed stitches of the seam, a knife segment pivotally carried on the feed support co-axially with the awl segment, a spring acting to retract the knife seg-

ment, an abutment on the awl segment operative during retracting movement of the awl to positively retract the knife segment, a latch pivoted on the needle segment to engage the knife segment, spring means for moving the latch to an inoperative position, a stop to arrest the retracting movement of the knife segment in a position to permit a free movement of the latch to the rear of said segment for an extreme advance position of the needle segment and needle through the work, and means for moving said latch into operative position to the rear of the knife segment.

26. An inseam shoe sewing machine for sewing the upper to the rib of the sole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the stitch receiving channel, a feed support for the awl, a knife for slashing the sewing rib of the sole, a knife segment carried on the feed support for imparting an arcuate movement to the knife against the channel side of the rib, means acting when rendered operative during the retracting movement of the needle to advance the knife, means operative during the retracting movement of the awl to retract the knife, means under the control of the operator for actuating said means to advance the knife, and a connection actuated by the advance of the feed support for positively disconnecting said operator control means.

27. An inseam shoe sewing machine for sewing the upper to the rib of the sole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the stitch receiving channel, a feed support for the awl, a knife for slashing the sewing rib of the sole, a knife segment carried on the feed support for imparting an arcuate movement to the knife against the channel side of the rib, means acting when rendered operative during the retracting movement of the needle to advance the knife, means operative during the retracting movement of the awl to retract the knife, and means under the control of the operator for throwing said means for advancing the knife into and out of operation.

28. An inseam shoe sewing machine for sewing the upper to the rib of the sole of a shoe presented to the machine having, in combination, stitch forming devices including a curved needle arranged to enter the outside of the work, a cooperating awl arranged to enter the stitch receiving channel, a feed support for the awl, a knife for slashing the sewing rib of the sole, a knife segment carried on the feed support for imparting an arcuate movement to the knife against the channel side of the rib, means acting when rendered operative during the retracting movement of the needle to advance the knife, means operative during the retracting movement of the awl to retract the knife, a treadle, and connections therefrom for throwing said means for advancing the knife into and out of operation during the continued operation of the machine in sewing a seam.