

E. N. ANDREWS.
EDGE SNIPPING MECHANISM.
APPLICATION FILED SEPT. 14, 1915.

1,237,990.

Patented Aug. 21, 1917.
4 SHEETS—SHEET 1.

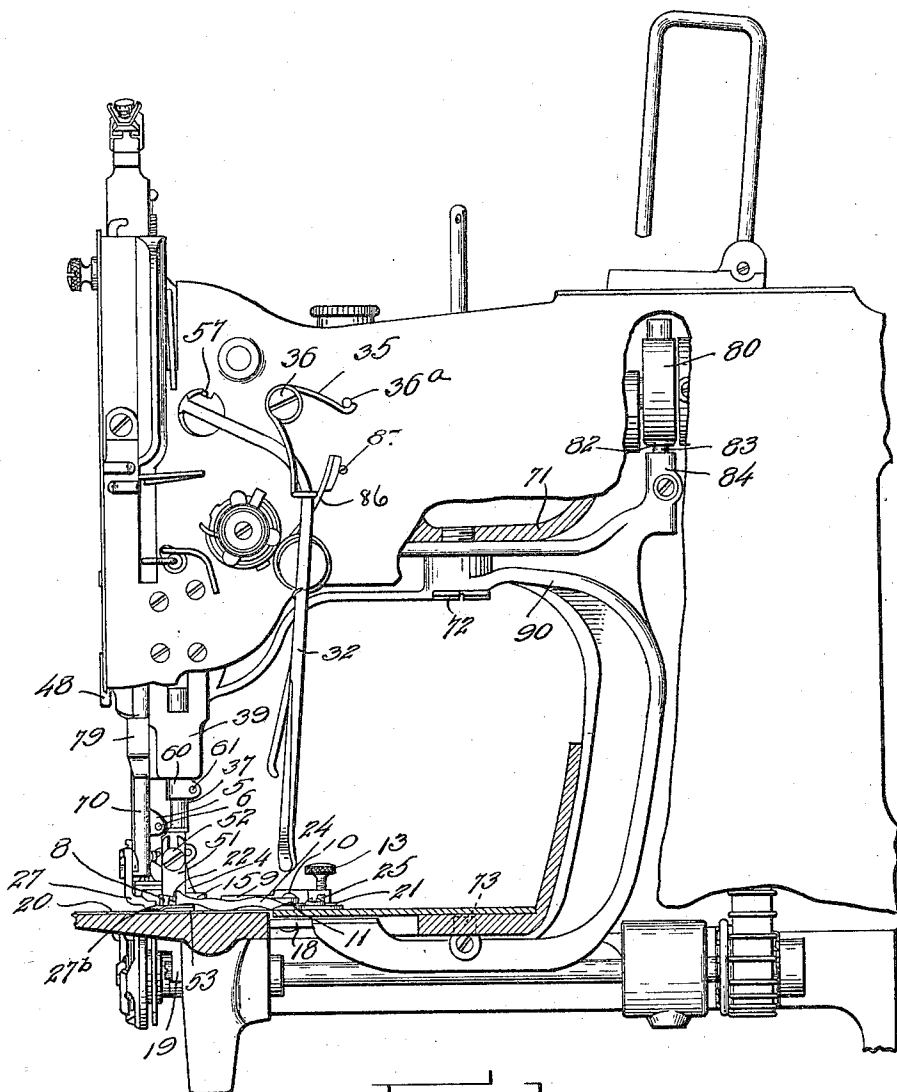


FIG. 1.

Witness
L. L. Sargent
L. L. Sargent

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Inventor
Edwin N. Andrews
James A. Mathews
Attorney

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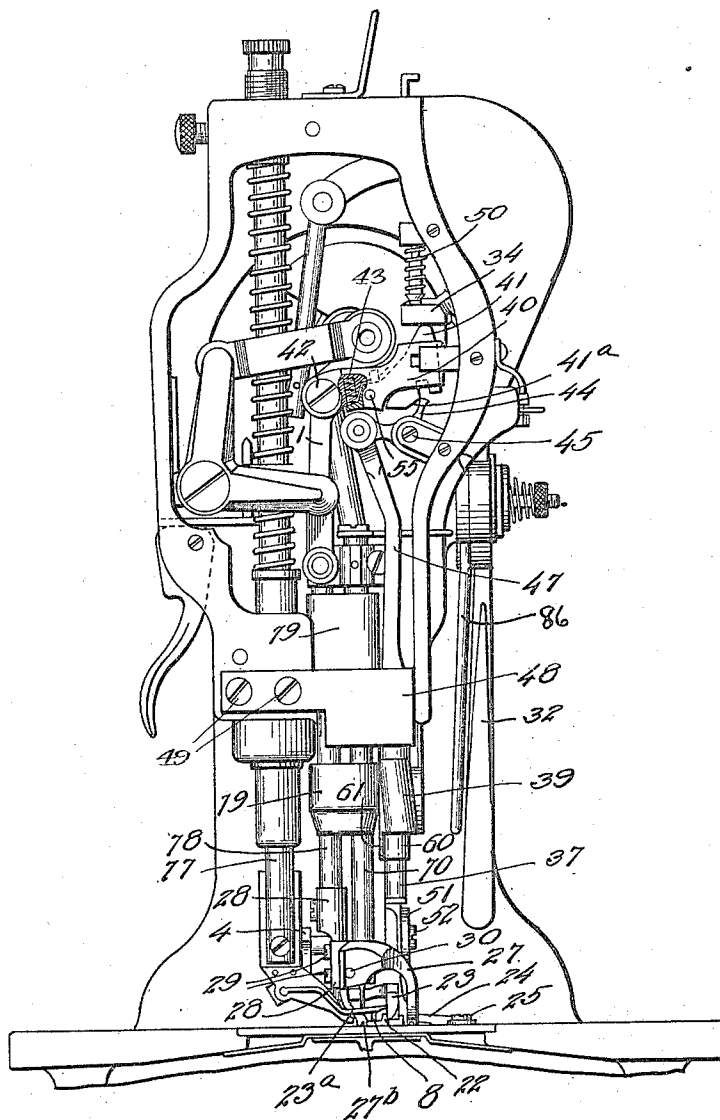


FIG. 2.

Witness
L. L. Sargent
Lester L. Sargent

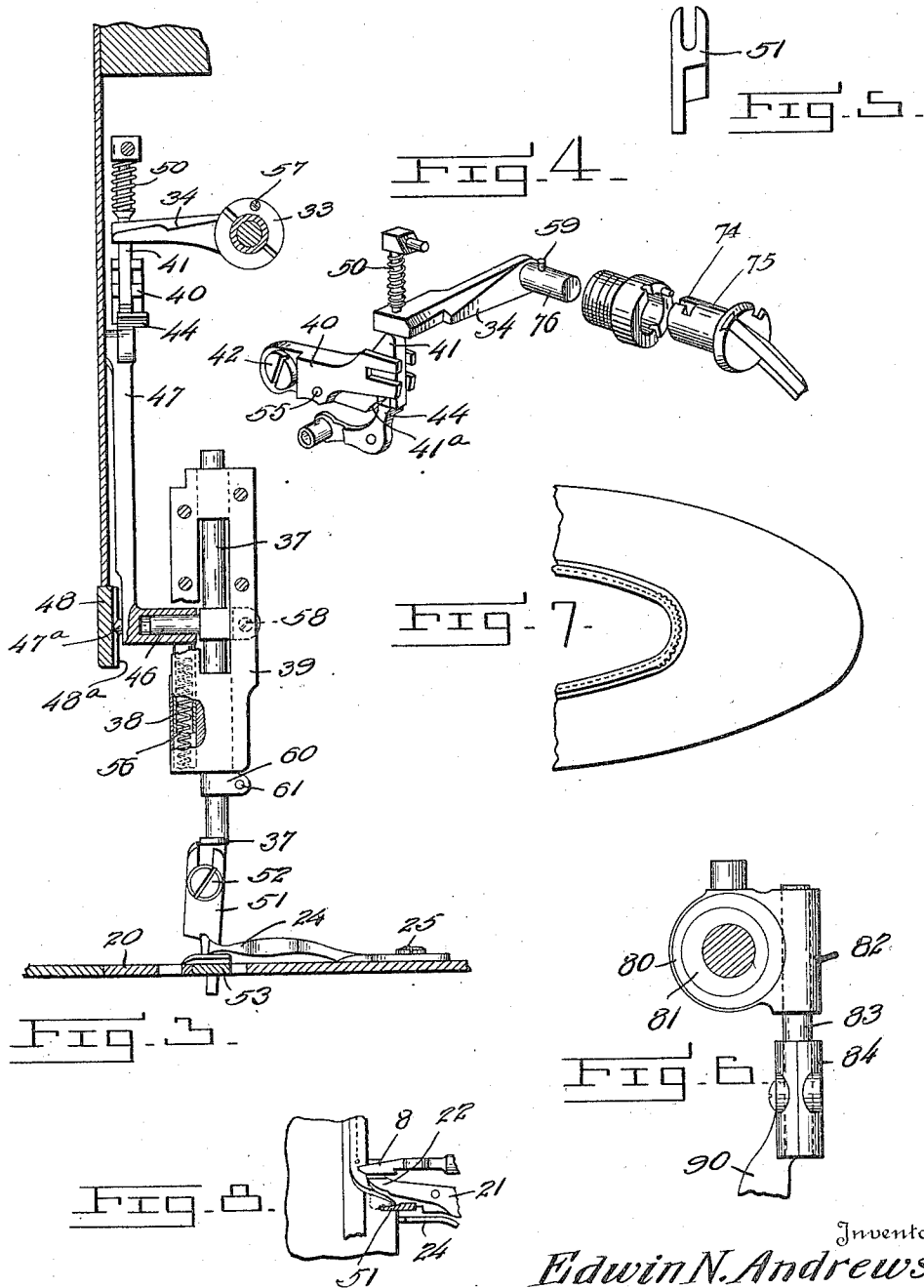
By

Inventor
Edwin N. Andrews,
James A. Mathews,
Attorney

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Witnesses
R. L. Cunningham
Edwin N. Andrews

Inventor
Edwin N. Andrews.
By *James A. Mathews,*
Attorney

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4 SHEETS—SHEET 4.

Fig. 9.

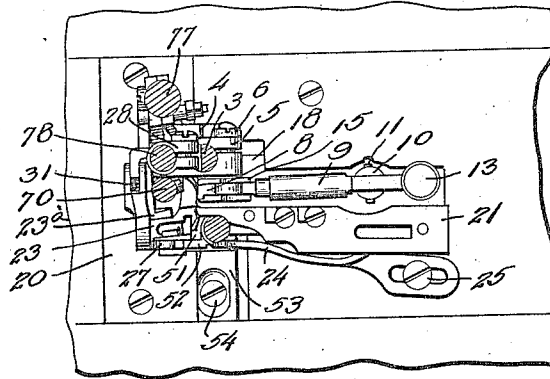
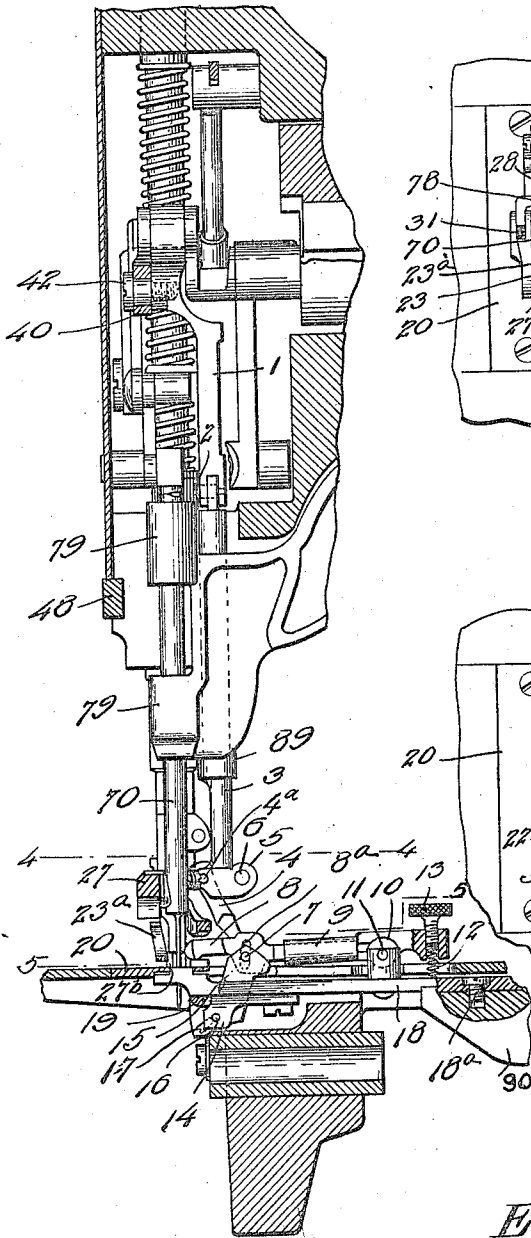


Fig. 10.

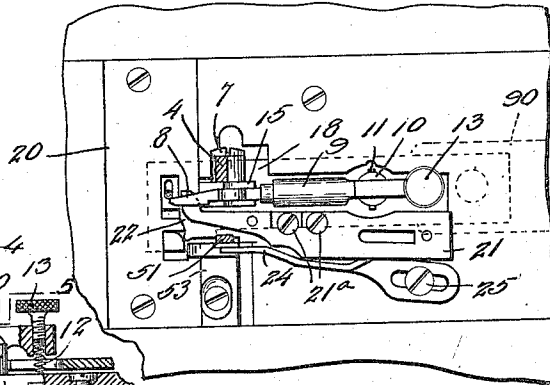


Fig. 11.

Inventor
Edwin N. Andrews

Witnesses
Lester L. Sargent.

By *James A. Mathews,*
Attorney

UNITED STATES PATENT OFFICE.

EDWIN NATHANIEL ANDREWS, OF FORT DODGE, IOWA.

EDGE-SNIPPING MECHANISM.

1,237,990.

Specification of Letters Patent.

Patented Aug. 21, 1917.

Original application filed December 8, 1914, Serial No. 876,073. Divided and this application filed September 14, 1915. Serial No. 50,611.

To all whom it may concern:

Be it known that I, EDWIN N. ANDREWS, a citizen of the United States, residing at Fort Dodge, in the county of Webster and State of Iowa, have invented a new and useful Edge-Snipping Mechanism in Combination with an Edge-Folding Attachment in a Sewing-Machine, of which the following is a specification.

The object of my invention is to provide a tape guide and snipping attachment to snip or slit the edge of a shoe upper in combination with a folding attachment to fold the edge of the upper in combination with stitching mechanism adapted to stitch the folded part with a tape guided and retained therein. The snipping mechanism makes it possible to insert a tape and properly fold the snipped edge of the upper at rounded portions thereof, and it is an object of my invention to provide means for setting such mechanism in motion and stopping it at the will of the operator. It is an object of my invention to eliminate the use of cements in connection with the folded edges of shoe uppers. It is also an object of my invention to do away with the necessity for having to clip or snip incurves by a separate operation. The purpose of the insertion of tape by my attachment is to protect all seams from breaking and to prevent the top of the shoe from becoming baggy or ill-shaped when worn, as the tape will prevent the shoe top from stretching, thereby insuring a snug fit on the foot, and also give the shoe the necessary strength to resist the various operations of manufacture. Other objects hereinafter appear.

This application is a division of my co-pending application, Serial No. 876,073, filed December 8, 1914, directed to the portion of my attachment that performs the folding operation. The accompanying drawings illustrate my invention.

Figure 1 is a front elevation with parts broken away to show the eccentric and bracket 90 which it operates; Fig. 2 is an end view of my attachment, with the sewing machine cover plate removed; Fig. 3 is a fragmentary view of the edge snipping mechanism; Fig. 4 is a perspective showing the mechanism for throwing the edge snipping mechanism into and out of operative position; Fig. 5 is a detail of the edge snipping knife; Fig. 6 is a detail of the ec-

centric 81 for driving bracket 90 shown in Fig. 1; Fig. 7 is a view of the material folded and also snipped for or to make possible the folding of an incurve; Fig. 8 is a fragmentary view showing the operation of folding and the relative position of the snipping knife and folding means; Fig. 9 is a vertical section showing the driving, feeding and folding mechanism; Fig. 10 is a horizontal section on line 4-4 of Fig. 9; and Fig. 11 is a horizontal section on line 5-5 of Fig. 9.

My attachment combines an edge snipping mechanism with edge folding means in combination with a sewing machine, and the mechanisms being operatively connected and in some degree dependent a description of both is essential to a full and clear understanding of the invention. In my edge folding mechanism I provide a folding bar connection 1, having its upper end connected to the eccentrically moving mechanism shown in Fig. 2, which travels in an approximately circular path and drives member 1 in an up-and-down movement $\frac{3}{4}$ of an inch. A folding bar 3 is pivotally attached to member 1 by hinge screw 2. A folding bar link 4 is provided having a pin 4^a on its upper portion by which it is connected to collar connection 5. A stud screw 7 connects folding finger 8 to the bifurcated hinge connection 15. Stud screw 7 passes through the lower end of folding bar link 4 and engages in the upper end of hinge connection 15. It also passes through the slot 8^a of the folding finger 8. Folding finger 8 has a sleeve connection with sleeve member 9, as illustrated in Fig. 9. Sleeve member 9 is attached to feed dog 18, and is moved from front toward back of sewing machine by pivotally-moving bracket 90. Folding bar 3 reciprocates vertically in bearings 89 which are mounted on the upper end of pivotally-moving bracket 90. Thus bracket 90 moves bearings 89 from front to back synchronously with the front to back movement of feed dog 18. Sleeve member 9 is connected to feed dog 18 by hinge pin 11 in sleeve hinge bracket 10. Hinge connection 15 is attached to hinge bracket 14 by pin 16, and to feed dog 18 by two screws. Sleeve member 9 is provided with an adjusting thumb screw 13 and a presser spring 12, as illustrated in Fig. 9, which keeps folding finger 8 in its proper position. Mem-

bers 2 to 16, inclusive, and 18 are all operatively connected to folding bar connection 1, which in turn is operatively connected with eccentrically driven mechanism, as illustrated in Fig. 2, causing member 1 to reciprocate vertically $\frac{3}{8}$ ds of an inch. This operation causes folding finger 8 to travel from right to left a like distance, at the same time traveling from front toward back of sewing machine, as tape and material into which it is folded is fed toward the back of the sewing machine. Feed dog bridge 19, normally a part of the sewing machine, is attached by two screws and is mounted directly under throat plate 20. On it slides the feeding mechanism. Feed dog 18 has an orifice at its right hand end for a screw by which it is attached to the feed actuating mechanism of the sewing machine. The feeding end of feed dog 18 protrudes upward through throat plate 20. A portion of throat plate 20 rests upon and the underside acts as a slide plate for the feeding end of feed dog 18. Consequently, feed dog 18 is limited to a horizontal movement, traveling from front to back. Folding finger 8 simultaneously moves from right to left in its sleeve bearing 9. A small set screw 17, shown in Fig. 9, engaging pin 16, holds it in place, it in turn securing hinge bracket 14 to hinge connection 15.

I provide a tape guiding presser foot 23, adapted to be attached to presser bar 77, the latter not my invention, and which runs through a bushing attached to the frame of the machine. A vertical movement only is had. I provide an alternating presser foot 27 of original design, illustrated in Fig. 2, pivotally attached to bar 78 by hinge pin 30 and normally pressed to its lowermost position by a small spring 31. Alternating presser foot 27 is mounted on bar 78 by means of bracket 28 and hinge pin 30, the bracket 28 being fastened by bracket screws 29. Tape guiding presser foot 23 and alternating presser foot 27 have an alternate up-and-down movement.

Needle bar 70 and presser bar 78, carrying alternating presser foot 27, travel up and down in their bearings 79, the latter being the upper end of the pivotally-swinging bracket 90. Member 90, as illustrated in Fig. 1, is pivotally mounted to the sewing machine by suitable pivotal means, as at 72 and 73. Member 90 is provided with a clamp extension 84, which engages rod 83, which in turn is engaged by sleeve 82. Sleeve 82 is engaged with eccentric strap 80 which encircles and is actuated by eccentric 81, driven from the main shaft in the arm of the machine. Thus member 90 is actuated in a pivotally swinging path from front toward back of sewing machine, thus feeding along the material under the presser feet. Members 77, 78, 79, 90, 84, 83,

82, 80 and 81 normally constitute a part of the sewing machine, but are put to a new use by their combination with my attachment.

Feed dog 18 is attached to and actuated by the lower end of the pivotally swinging bracket 90, as illustrated in Fig. 3, screw 18^a being the preferred fastening means. Presser bar 78 with presser foot 27, needle bar 70, and feed dog 18, by reason of their attachment to pivotally swinging bracket 90, move in unison from front to back. Folding bar 3, in bearings 89, is attached to the upper end of pivotally swinging bracket 90, and members 3 to 18, inclusive, all being operatively connected with member 90, move in unison from front to back. Folding bar connection 1, attached to the eccentrically operating mechanism shown in Fig. 2, travels up and down $\frac{3}{8}$ ds of an inch.

Referring to Fig. 9, the lower part of folding bar link 4 is attached by screw 7 to the upper part of hinge connection 15, screw 7 also engaging in slot 8^a of folding finger 8. It follows that when the upper part of folding bar link 4 is moved up and down, the folding finger 8 moves horizontally from right to left, besides having a front to back path of travel. The folding operation is clearly illustrated in Fig. 8. The desired width of fold is obtained by releasing presser bar 77, at which time presser foot 23 is adjusted as desired, and by moving edge turning or folding wall member 21 toward or from the needle, which is adjustably mounted, being engaged by screws 21^a, and is provided with suitable folding end 22, as illustrated. Folding finger 8 is shown resting on folding wall member 21. When the material to be folded, as shown in Fig. 8, is moved by the feeding members, folding finger 8 moves from right to left, and in moving folds the edge of the material operated on, as illustrated in Fig. 8, and holds it there until folding finger 8 and alternating presser foot 27, with the needle which is traveling toward its lowest point, feeds the material, as it is thus folded, the required length of stitch in a movement toward the back of the machine. At this point presser foot 23 comes into contact with the material; alternating presser foot 27, and also the needle, are raised up and also swung forward preparatory to repeating the operation of descending on the material. Presser foot 23 moves in its bearings in a vertical direction only; while alternating presser foot 27, with needle bar 70, has a motion which, while the pressure on the material is alternating with presser foot 23, is approximately elliptical, or its path of travel may be described as backward the length of the stitch, then up and forward, then down. The needle and alternating presser foot 27 have a like motion.

Presser foot 23 is provided with a slotted end, which provides the necessary means of guiding a tape in its downward course, and under the said presser foot 23 toward the needle, which, when the tape is engaged by the needle, its line of travel is from front toward back, with its right edge forming a straight line, an adjustable distance to the right of the needle. The material to be folded enters upon its folding operation by being placed under the tape and presser feet, with its edge to be folded extending the desired distance to the right of the line of tape, which has been guided by presser foot 23 and engaged by the needle as described. Folding finger 8 having been actuated by the folding mechanism, travels horizontally toward the adjusted tape line, pressing the outer edge of the material to be folded over the tape. The tape so guided and engaged by the needle furnishes a substantial and taut adjustable straight line, which enables folding finger 8, by its horizontal motion to complete the folding operation which has been started, when the material to be folded comes in contact with folding wall member 21.

In the edge slitting mechanism I provide a thimble bushing 33, shown in Fig. 4, which screws into the sewing machine, its inner portion forming a bearing to receive hub or bearing end 75 of hand lever 32. Hub or bearing end 75 is bored out to form a bearing for stud portion 76 of lever 34, with stop pin 59 which projects into offset slot 74 in the hub or bearing end 75. Thus members 34, 33 and 32 are maintained in operative engagement. Stop screw 57 engages in thimble bushing 33, as illustrated, to prevent unnecessary movement of hand lever 32. I provide a spring 35, attached to hand lever 32 and engaging member 36 and projection 36^a. Spring 35 operates to press hand lever 32 toward the left of the sewing machine, thus holding hand lever bearing end 75 engaged at offset slot 74 with stop pin 59 to keep lever 34 in its elevated position, pressing upward against spring 50, and releasing pressure from pawl 41, as will be understood by reference to Figs. 1 and 4. Stop screw 57 is adapted to engage in the slotted portion of lever 32, and thus prevents spring 35 from raising lever 34 and spring 50 more than desired. I also provide an auxiliary hand lever locking member 86 attached to hand lever 32 and having a hooked portion adapted to engage with a projecting pin 87 on the sewing machine to retain hand lever 32 in its extreme right hand position, when desired, in which position it causes lever 34 to press downward on pawl 41.

Hand lever 32 and auxiliary hand lever locking member 86 are attached to each other by means of a stud screw. (See Fig.

2). Auxiliary hand lever locking member 86 is provided with a partially coiled spring to retain it in its proper position, and effect engagement with projecting pin 87 at its upper end. The lower end of the auxiliary locking member 86 extends downward slightly out of alinement with lever 32, which lower end on being pressed will release the upper catch portion from engagement with member 87.

When the operator moves hand lever 32 to the right, portion 75 is rotated, and the bottom of offset slot 74 recedes from its position under stop pin 59. Knife starting lever 34 is operated, pressing pawl 41 downward until that member, depressed also by spring 50, engages with bell crank 44, which is supported by and adapted to oscillate on hinge screw 45. A small pawl spring 43 illustrated in Fig. 2, tends to maintain pawl 41 in its proper place in engagement with member 34. Pawl 41 is pivotally mounted in member 40 by means of pin 55, as illustrated. Member 40 is attached to folding bar connection 1 by screw 42, member 1 being actuated as hitherto explained and as illustrated in Fig. 2. Member 40 is capable of a front-to-back oscillation of approximately $\frac{3}{16}$ ths of an inch. I prefer to provide pawl 41 with a beveled face 41^a, positioned to engage with and move bell crank 44 from its lowered to its raised position with the forward movement of the pawl 41, but parting therefrom with the reciprocating movement of pawl 41 toward the back of the sewing machine. The upper arm of bell crank 44 is adapted to engage with the slotted portion of pawl 41 when the latter is in its lowered position. Attached to the lower arm of bell crank 44 is a link 47 which is operatively connected with stud 46, the latter in turn being attached to knife bar 37, as illustrated in Fig. 3. Knife bar 37 is mounted on bracket 39, which in turn is attached to the sewing machine by screws as shown in Fig. 3. I also provide a pinch screw 58 to engage the pinch end of stud 46 to knife bar 37. The lower end of link 47 is a sleeve into which stud 46 enters, as shown in Fig. 3. I provide an adjusting way block 48, shown in Figs. 2 and 3, having a groove 48^a, in which projection 47^a of link 47 slides. Screws 49 are provided by loosening or tightening which the desired adjustment between members 47 and 48 may be obtained.

A casing 38 for knife bar spring 56 is provided under the lower part of link 47, this spring tending to maintain members 37, 46, 47 and 44 in their elevated position, when pawl 41 is also in elevated position. Engaged to knife bar 37 is a collar 60, secured by pinch screw 61. It prevents spring 56 from pushing knife bar 37 up more than is allowed by stop collar 60 on its coming

in contact with the bottom of knife bar bracket 39. A cutter block 53 is attached to the table portion of the sewing machine by screw 54, as shown in Figs. 10 and 11.

5 Edge snapping knife 51, shown in detail in Fig. 5, is adjustably attached to knife bar 37 by screw 52, as illustrated in Fig. 3.

In operation the material to be folded is fed under tape guiding presser foot 23 and alternating presser foot 27, with the edge guided up to edge guide 24, the edge to be folded passing over cutter block 53. To put the edge snapping knife 51 into operation, the operator pushes hand lever 32 to the right. Thereupon lever 34 causes the slotted portion of pawl 41 to engage the upper arm of bell crank 44, which through link 47, stud 46, knife bar 37 and edge snapping knife 51 starts the edge snapping operation, knife bar 37 being reciprocated vertically with the reciprocating motion transmitted to it from bell crank 44, which receives its reciprocating movement from pawl 41, member 40 and folding bar connection 1, the latter being actuated by eccentrically driven mechanism from the main shaft of the sewing machine. When it is desired that edge snapping knife 51 stop its operation, the lower end of auxiliary hand lever 86 attached to hand lever 32 is pressed toward the right, which releases hand lever 32. The latter, which has been held in its extreme right hand position by auxiliary hand lever locking member 86 engaging with pin 87, is then returned to its normal position by the action of spring 35 pressing to the left against it. As hand lever 32 is returned to its normal position, offset slot 74 comes into contact with pin 59 on stud 76 of lever 34, raising the starting lever. The latter on being moved into its elevated position causes pawl 41 to release bell crank 44. That member, actuated by spring 56 (through its operative connection with stud 46 and link 47) may be returned to its elevated and disengaged position as related to pawl 41; or if not returned by reason of spring 56 not exerting a sufficient degree of pressure for this purpose, is returned to the position described by pressure exerted by beveled face 41^a of pawl 41 with the immediately succeeding back toward front movement of that member, bell crank 44 thereafter being retained in this disengaged position by the action of spring 56 through the operatively connected elements above described, until the slotted portion of pawl 41 is again brought into engagement with the upper arm of the crank member 44. It will be observed that the edge snapping mechanism may be thrown into or out of operation while the folding mechanism is in operation, so that the snapping may be commenced and discontinued at any desired moment, as the work requires, without delaying or interfering with the stitching and

folding operations. It will of course be understood that the character of the tape and uppers operated on may vary to any extent; and also that modifications in details of construction not constituting a departure from the required mode of operation are within the contemplation of my invention.

Having thus described by invention, what I claim as new and desire to secure by this divisional application, is:

1. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle and adapted to snip the edge of the material at evenly spaced portions in advance of its folding, edge folding mechanism, adjustable tape guiding means, adjustable means guiding the edge of the material, adjustable reciprocating feeding means, means for reciprocating the cutting mechanism, and means for engaging and disengaging same from operative position.

2. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle means operated by the main shaft of a sewing machine for actuating same, means for throwing the cutting mechanism into and out of operation, and means for locking the cutting mechanism in operative position, substantially as set forth.

3. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle, means operatively connected with the sewing machine for vertically reciprocating the cutting mechanism, means for throwing the cutting mechanism into and out of operative engagement with the actuating means, and edge folding mechanism.

4. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle, means vertically reciprocating same, edge folding mechanism, means operatively connecting the edge-folding mechanism and the cutting mechanism, and means for throwing the cutting mechanism into and out of operative engagement with the edge folding mechanism.

5. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle, means for adjusting the cutting mechanism, means for reciprocating the cutting mechanism actuated by the sewing machine, means for throwing the mechanism reciprocating the cutting mechanism into and out of operation, and means for locking the aforesaid means in or out of operative position.

6. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle, means adapted to be operated by the sewing machine for vertically reciprocating the

cutting mechanism, a knife starting lever, a resiliently pressed pawl actuated by said lever, a bell crank operatively connected with the means for reciprocating the cutting mechanism and adapted to operatively engage with the aforesaid pawl.

7. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle, vertically reciprocable means actuating the cutting mechanism, a starting lever, a resiliently pressed pawl actuated by the lever, a bell crank operatively connected with the vertically reciprocable means for actuating the cutting mechanism and adapted to engage with the pawl, an oscillating member adapted to engage with the bell crank, and means for locking the edge snipping mechanism in and out of operative position, substantially as set forth.

8. In a sewing machine, a cutting mechanism having a blade arranged transversely to the line of feed and in front of the needle, a projecting guiding portion integral with and extending substantially beyond the blade, means operated by the main shaft of a sewing machine for vertically reciprocating the cutting mechanism, means for adjusting the cutting mechanism to vary the width of the slit made by it, and means for throwing into and out of operative position the means actuating the cutting mechanism, substantially as shown and for the purposes described.

9. In a sewing machine, a laterally and

vertically adjustable edge snipping knife having its blade arranged transversely to the line of feed and in front of the needle, resiliently actuated means for vertically reciprocating the edge snipping knife, a lever adapted to throw the last-mentioned means into and out of operative position, resilient means normally retaining the hand lever in inoperative position, and means carried by the hand lever and adapted to releasably retain the hand lever in position to maintain in operative position the means actuating the edge snipping knife, substantially as set forth.

10. In a sewing machine, a hand lever, means for locking it in and out of operative position, a cylindrical bearing portion having an L-shaped slotted part, a thimble bushing mounted thereon, a starting lever operatively engaging the hand lever, a resilient member normally pressing on the end of the starting lever opposite the bearing end, a pawl actuated by the starting lever, a bell crank actuated by the pawl, a link member actuated by the bell crank, means operatively connected with the aforesaid link adjustably supporting an edge snipping knife, and an adjustable edge snipping knife having its blade portion arranged transversely to the line of feed and in front of the needle.

EDWIN NATHANIEL ANDREWS.

Witnesses:

PHOEBE K. PEELER,
M. G. HELLINGS.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."