

Sept. 2, 1930.

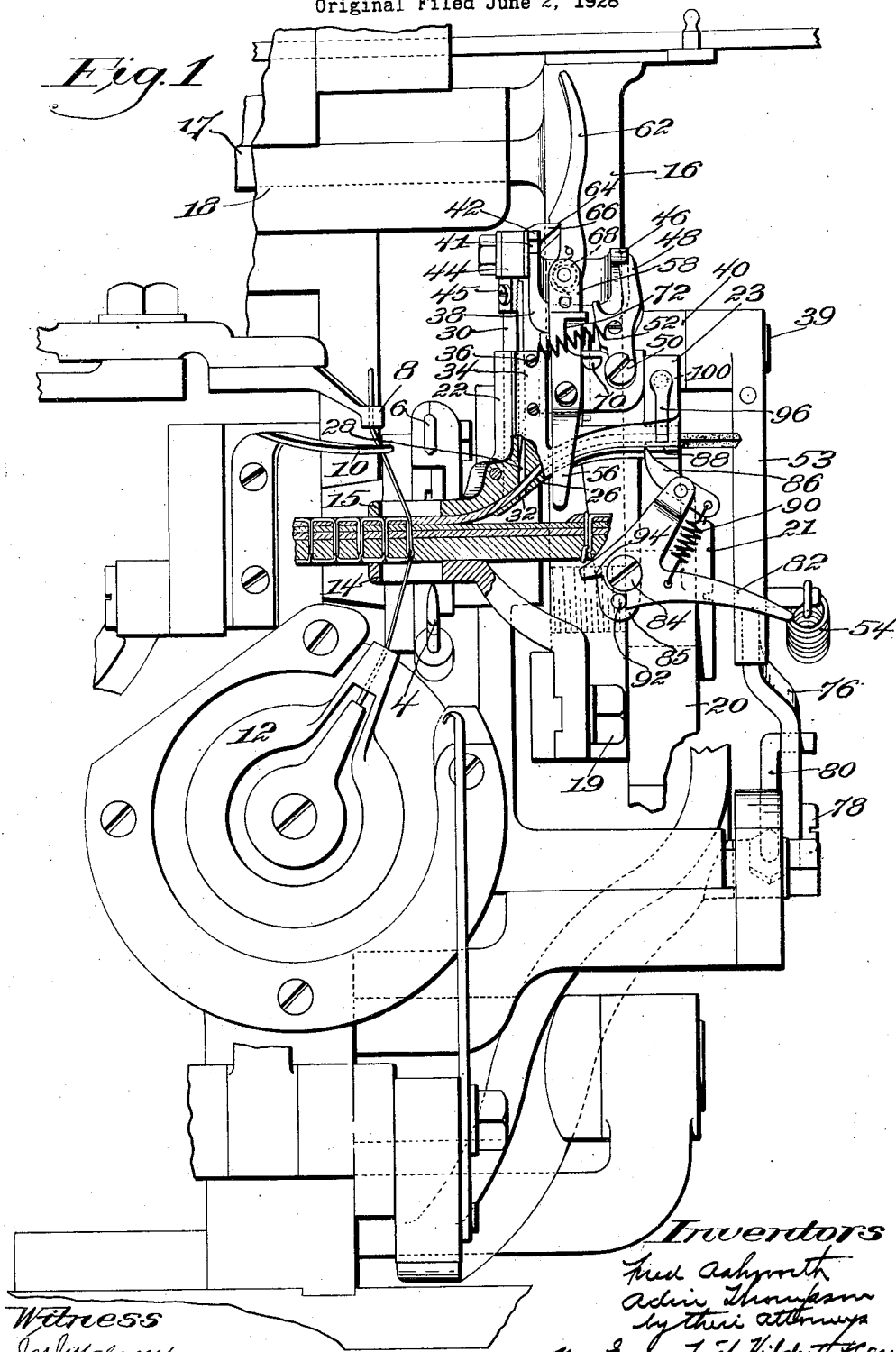
F. ASHWORTH ET AL

1,774,498

SHOE MACHINE

Original Filed June 2, 1928

3 Sheets-Sheet 1



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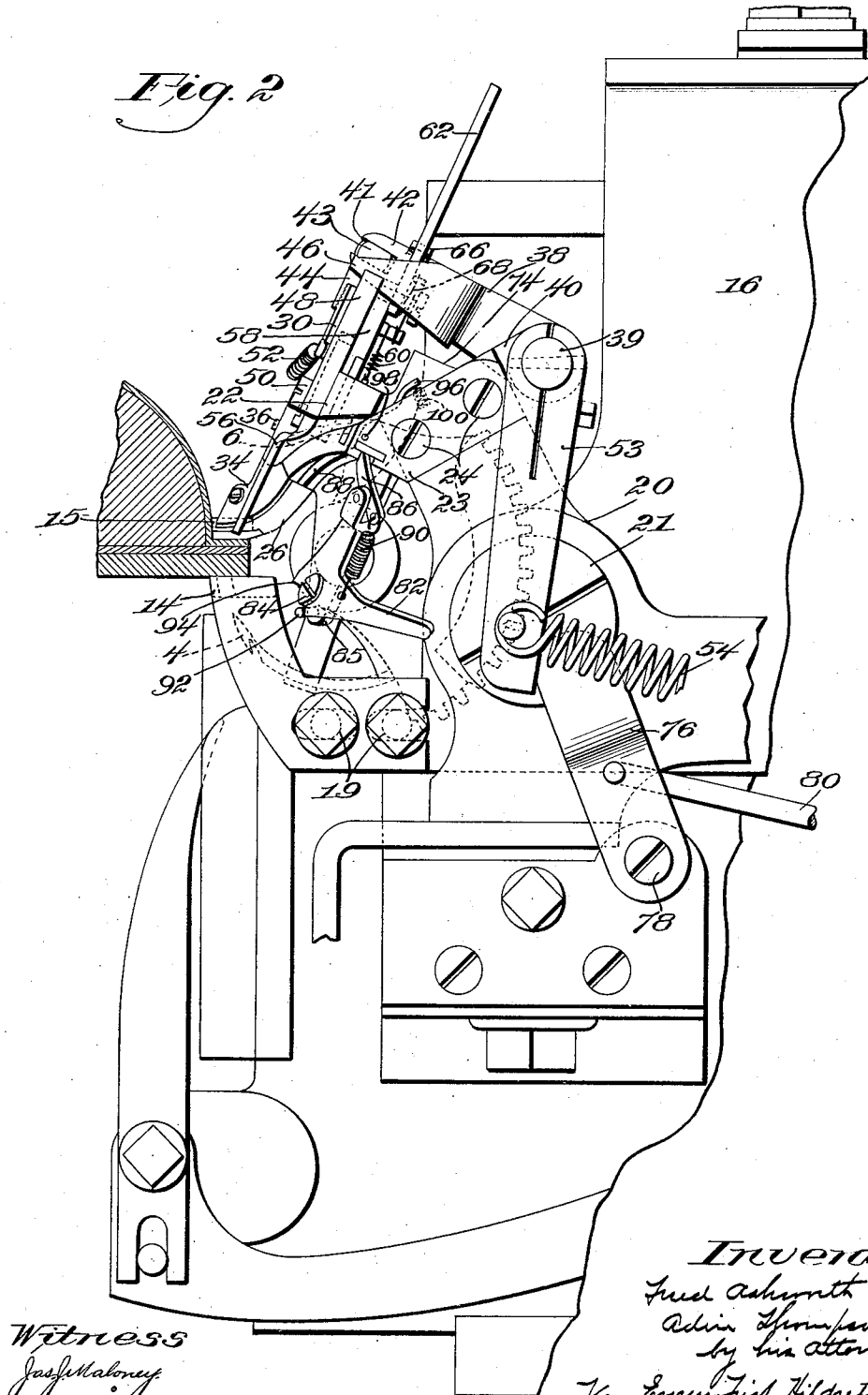
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Fig. 2



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Fig. 3

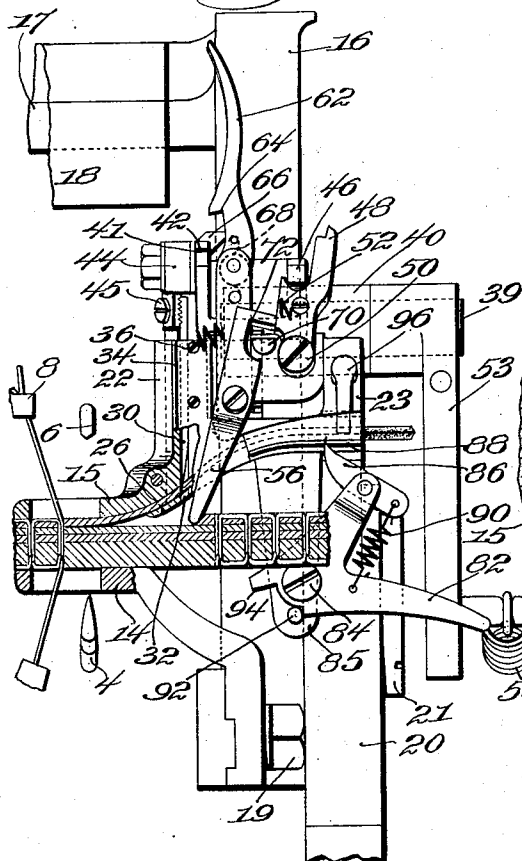


Fig. 4

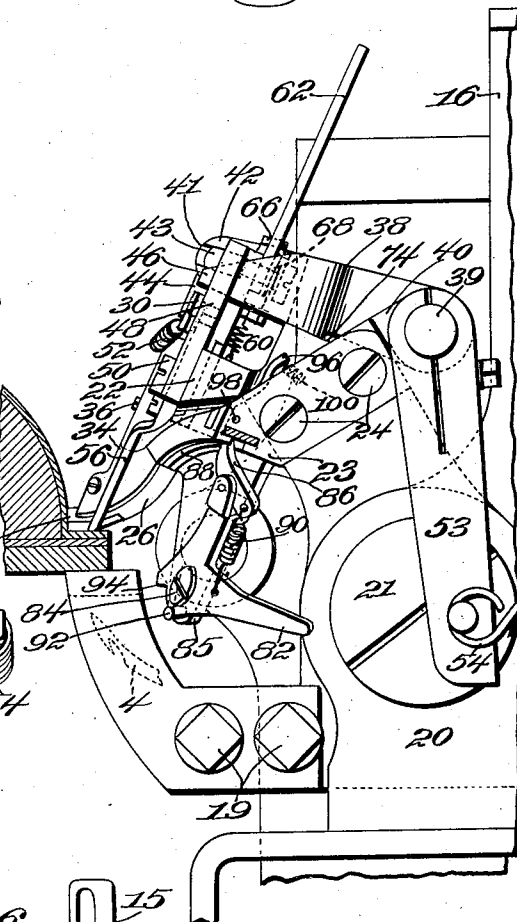


Fig. 5

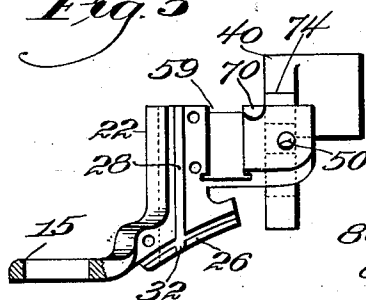


Fig. 6

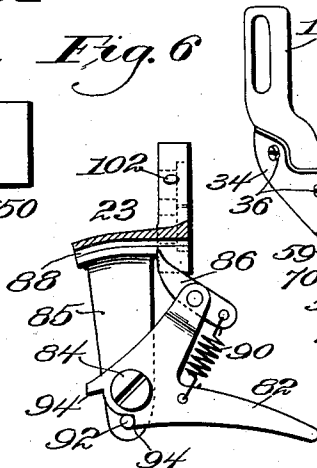
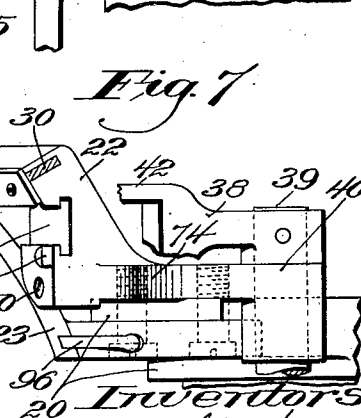


Fig. 7



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UNITED STATES PATENT OFFICE

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SHOE MACHINE

Application filed June 2, 1928, Serial No. 282,354. Renewed February 19, 1930.

The invention relates to shoe machines and is herein disclosed as embodied in a machine adapted for use in the manufacture of stitch down shoes to stitch the welt to the out-turned upper and outsole of a shoe.

The primary object of the invention is to provide a welt cutting mechanism in a welt attaching machine of this or similar character for operating on a shoe provided with a welt running completely around the shoe which will operate automatically to cut the welt to form a joint with the leading end of the attached welt at the conclusion of the welt attaching operation.

With this object in view, the principal feature of the invention consists in the provision of a welt cutting knife together with means operating automatically at the proper time during the welt attaching operation for throwing the welt cutting knife into operation to cause the knife to cut the welt at the point required to form a joint between the two ends of the attached welt. In the construction hereinafter described, the mechanism operating automatically to throw the welt cutting knife into operation comprises a feeler member which is adapted to engage with the leading end of the attached welt near the close of the welt attaching operation. The several features of the invention consist also in the devices, combinations, and arrangement of parts hereinafter described and claimed.

The several features of the invention and the advantages to be obtained thereby will be readily understood by those skilled in the art by the following description taken in connection with the accompanying drawings, in which Fig. 1 is a view in front elevation partly in section of so much of a sewing machine embodying the present invention as is necessary to show the connection of the invention therewith; Fig. 2 is a view in side elevation of the parts shown in Fig. 1; Fig. 3 is a view in front elevation similar to Fig. 1 but showing the position of the parts after the automatic welt cutting mechanism has been thrown into operation to cut the welt; Fig. 4 is a view in side elevation of the parts as shown in Fig. 3; Fig. 5 is a detail view in

front elevation of one portion of the presser foot block; Fig. 6 is a sectional view of the remainder of the presser foot block; and Fig. 7 is a plan view of the block with the parts assembled on the presser foot lever.

As has been stated, the present invention is disclosed in the drawings as embodied in a sewing machine adapted to stitch the welt to the out-turned upper and sole of a stitch down shoe supported upon a last. In the machine shown, the operating parts, including a needle, an awl, a looper, a thread finger, and a shuttle are so arranged that the work is fed to the machine in an upright position, the construction and operation of these parts and other parts of the machine not hereinafter specifically described being the same as the corresponding parts of the machine disclosed in the patent to Eppler, No. 622,337, dated April 4, 1899.

The machine is also provided with a welt guide and a welt severing knife which are both mounted on the presser foot, and in order to insure the proper operation of the welt cutter to join the two ends of the welt as exactly as possible and also to facilitate rapid handling of the work by the operator, mechanism is provided which operates automatically to cause the knife to cut the welt and form the desired joint with the attached leading end of the welt.

Other novel features of the illustrated machine include a hand lever for feeding the end of the welt strip through the welt guide into position to be engaged by the sewing devices and a friction device to prevent the welt strip from drawing back through the welt guide when not engaged by the sewing devices.

Referring to the drawings, the needle is indicated at 4, the awl at 6, the looper with some of its actuating connections is indicated at 8, the thread finger at 10, and the shuttle at 12. The work support is indicated at 14 and the presser foot at 15, these parts being carried on a depending arm or plate 16 carried by the feed slide 17 which is mounted to slide on ways 18 transversely of the machine to feed the work. The work support

14 is secured to the lower end of the plate 16 by means of the screws 19.

The presser foot lever indicated at 20 is mounted on a fixed pivot 21 formed on the depending arm or plate 16 of the feed slide 17 and carries at its upper end a unit composed of the two blocks 22 and 23 which fit closely together and are clamped in position one on each side of the presser foot lever 20 by means of the screws 24. The block 22 has formed on one end the presser foot 15 and on its under side is provided with a grooved portion 26 which forms a guide for the welt as it is fed to the devices for attaching the welt to the shoe. This groove or guideway is continued through the under portion of the block 23 which is associated therewith on the presser foot lever. The forward end of the block 22 is also provided with a substantially vertical slot 28 which intersects the welt guide 26 and is adapted to receive the reciprocating knife 30 which operates through a slot 32 formed in the supporting under side of the guideway 26 to sever the welt. A plate 34 fastened to the side of the block 22 by screws 36 acts to hold the knife in the slot and also forms one of the side walls for the welt guideway adjacent to the presser foot.

The knife and welt guide are arranged to cause the welt to be cut at an inclination to the welt surface downwardly in the direction of the feed so that when the two ends are placed together, their bevels form an unbroken surface on the grain side of the welt.

The mechanism for automatically actuating the knife 30 comprises a forked lever arm 38 which is secured to a rock shaft 39 pivotally mounted on an arm 40 of the presser foot block 22. The knife is operatively connected to move with the lever arm 38 through connections which include a slot 41 formed on one arm 42 of the forked portion of the lever arm 38 and adapted to receive a cam block 43 which is rotatably mounted on a bracket 44 adjustably secured to the upper end of the knife 30 by means of a screw 45. The other arm 46 of the fork is adapted to engage with a knife supporting latch 48 which is pivoted at 50 on the presser foot block 22 and is normally held in operative position by means of a tension spring 52 connected at one end to the latch 48 and at its other end to one of the screws 36 utilized to secure the plate 34 to the side of the block 22.

The lever 38 and the rock shaft 39 are actuated to operate the knife 30 by means of a downwardly extending lever arm 53 which is secured to the free end of the rock shaft 39. A heavy spring 54 which is connected at one end to the downwardly extending lever arm 53 tends to swing the lever arm 38 to cause the knife 30 to move downwardly to cut the welt. The lever arm 38 is normally held in retracted position against the pressure of the spring 54 by the engagement of the arm

46 of the forked portion of the lever with the latch 48 as above described.

In order to render the welt cutting mechanism active to cut the welt at a point to form a joint with the leading end of the welt, a feeler finger 56 is provided which is adapted to come into contact with the leading end of the welt and acts to disengage the latch 48 from the arm 46 to permit the lever arm 38 to swing about its pivot and cause the knife 30 to cut the welt at the required point. The feeler finger 56 is pivotally mounted on a slide 58 which is adapted to move vertically in a guideway 59 formed in the presser foot block 22. A tension spring 60 secured at one point to the presser foot block 22 and at another point to the slide 58 tends to force the slide 58 downwardly to bring the feeler finger 56 into operative position. The slide 58 is normally held in raised position against the pressure of the spring 60 to hold the feeler finger 56 out of engagement with the welt by means of a latch lever 62 which is pivotally mounted on the upper end of the slide 58 and provided with a notch indicated at 64 which is adapted to engage a corresponding ledge 66 formed on the arm 42 of the forked portion of the lever arm 38. A spring 68 coiled about its pivot tends to hold the lever 62 in engagement with the ledge 66.

During the normal operation of the machine, the slide 58 is raised with the feeler finger 56 in inoperative position to insure that the welt cutting mechanism is not thrown into operation by any projections or other obstructions in the work. When in this position the feeler finger is prevented from turning about its pivot to throw the welt cutting mechanism into operation by means of a cam projection 70 formed on the presser foot block 22 and adapted to engage with a portion of the feeler finger 56. As the welt attaching operation nears completion, the lever 62 is actuated by the operator to release the notch 64 from engagement with the ledge 66 to permit the slide 58 and the feeler finger 56 to move down into operative position. This movement of the feeler finger 56 brings a cut-away portion 72 of the feeler finger 56 opposite the cam projection 70 to permit the rotation of the finger. As the feeler finger is rotated by engagement with the leading end of the welt, the upper end of the feeler finger will come into contact with and disengage the latch 48 from the fork 46 permitting the lever arm 38 to rotate about its pivot to cause the knife 30 to descend and cut the welt. This movement of the lever arm 38 is limited by the engagement of the arm 46 of the forked portion of the lever with a surface 74 on the block 22. At the same time, the ledge 66 is brought below the notch 64 on the lever 62 so that when the lever arm 38 is returned to its original position, the slide 58 and

feeler finger 56 are again raised to their normal inoperative positions.

The lever arm 38 is returned to its original position against the pressure of its spring 54 to reset the welt cutting mechanism by means of a short lever 76 which is pivoted at 78 on the machine frame and is given a continuous reciprocatory movement in timed relation to the rotation of the main cam shaft through a connecting link 80. Upon the next revolution of the main cam shaft of the machine after the welt cutting mechanism has been thrown into operation, the movement of the lever 76 to the left as shown in Fig. 2, brings the upper end of the lever into contact with the lever arm 53 secured to the rock shaft 39 and rotates the rock shaft and lever arm 38 to permit the latch 48 to engage with the fork 46 so that the welt cutting mechanism is reset for the next welt attaching operation.

In order to facilitate the feeding of the end of the welt through the welt guide into position for a new sewing operation, a hand lever 82 is mounted at 84 on a depending portion 85 of the block 23 which forms a part of the presser foot unit, and is provided with a pawl 86 which is adapted to extend through a slot 88 in the welt guide into engagement with the welt strip. A tension spring 90 tends to hold the pawl 86 in operative position. The rotation of the hand lever 82 about its pivot 84 to advance the welt is limited by means of a pin 92 mounted on the depending portion 85 of the block 23 to engage with stops 94 formed on the hub of the hand lever 82. To hold the welt strip in the position to which it is advanced by the hand lever 82 and also to prevent slippage of the welt strip after it has been severed by the knife 30, a friction device is provided which comprises a lever 96 which is mounted at 98 on the block 23 and is forced in a direction to establish a frictional contact with the welt strip by means of a small compression spring 100 seated in a recess 102. With this construction, the welt may be moved forward quickly and accurately a uniform distance by the operator to bring the welt into position for a new welt attaching operation.

The nature and scope of the invention having been indicated and one embodiment thereof in a stitch down sewing machine having been described and illustrated, what is claimed is:

1. A welt laying and attaching machine having, in combination, welt attaching mechanism, means for guiding a sole and strip of welting past said mechanism, a knife to cut the welt to form a joint with the leading end of the welt, and means acting automatically as the attaching operation nears completion for throwing the knife into operation to cut the welt at a point to form a joint with the leading end of the welt.

2. A welt laying and attaching machine having, in combination, welt attaching mechanism, means for guiding a sole and strip of welting past said mechanism, a knife to cut the welt to form a joint with the leading end of the welt, means for actuating the knife to cut the welt, and a feeler mechanism actuated by the leading end of the welt to render said means active to cut the welt.

3. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a welt guide, a knife to cut the welt to form a joint with the leading end of the welt, means for actuating the knife, and a feeler member actuated by contact with the leading end of the welt to render said means active to cut the welt.

4. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a welt guide, a feeler member adapted to engage with the leading end of the welt, means under the control of the operator for moving the feeler member into operating position, and a device controlled by the feeler member to cut the welt to form a joint with the leading end of the welt.

5. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a welt guide, a knife to cut the welt to form a joint with the leading end of the welt, means for actuating the knife to cut the welt, a latch for holding the knife in retracted position, and a feeler finger actuated by contact with the leading end of the welt to release the latch.

6. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a welt guide and a welt cutter mounted on the presser foot, a feeler member adapted to engage with the leading end of the welt, and mechanism rendered operative by the engagement of the feeler member with the leading end of the welt to cause the knife to cut the welt.

7. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a welt guide, a knife mounted on the presser foot to cut the welt to form a joint with the leading end of the welt, a feeler finger adapted to engage with the leading end of the welt, a slide to which the feeler finger is secured mounted on the presser foot, a manually operable latch for holding the slide re-

tracted with the feeler finger out of operative position, and means rendered operative upon the contact of the feeler finger with the leading end of the welt for actuating the knife to cut the welt.

8. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a device mounted on the presser foot acting when rendered active to cut the welt, and a feeler mechanism mounted on the presser foot actuated by contact with the leading end of the welt to render said device operative to form a joint between the two ends of the welt.

9. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a device acting when rendered operative to cut the welt, a feeler mechanism actuated by contact with the leading end of the welt to cut the welt, and a manually operable mechanism for advancing the end of the welt strip into position for a new sewing operation.

10. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a welt guide, a feeler finger actuated by contact with the leading end of the welt, a spring pressed lever released by the feeler finger to actuate the knife to form a joint with the leading end of the welt, and mechanism for automatically returning the lever to its original position to retract the knife.

11. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a welt guide, a knife to cut the welt, a feeler finger actuated by contact with the leading end of the welt, a spring pressed lever for actuating the knife to form a joint with the leading end of the welt, and a latch for holding the lever in retracted position against the pressure of its spring actuated by the contact of the feeler with the leading end of the welt to release the lever.

12. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a welt guide on the presser foot, means for cutting the welt to form a joint with the leading end of the welt, and a manually operable mechanism for advancing the

end of the welt strip beyond the sewing point.

13. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on a last, a work support, a presser foot cooperating therewith, a welt guide on the presser foot, means for cutting the welt to form a joint with the leading end of the welt, a manually operable mechanism for advancing the end of the welt strip beyond the sewing point, and a friction device for holding the welt in position in the welt guide.

14. A sewing machine having, in combination, stitching devices for sewing a welt progressively to the out-turned upper and sole of a stitch down shoe positioned on the last, a work support, a presser foot cooperating therewith, a welt guide on the presser foot, a knife mounted on the presser foot to cut the welt to form a joint with the leading end of the welt, a feeler finger adapted to engage with the leading end of the welt, a slide to which the feeler finger is secured mounted on the presser foot, a manually operable latch for holding the slide retracted with the feeler finger out of operative position, means rendered operative upon the contact of the feeler finger with the leading end of the welt for actuating the knife to cut the welt, and means for automatically returning the slide and the knife to their inoperative positions.

In testimony whereof we have signed our names to this specification.

FRED ASHWORTH.
ADIN THOMPSON.