

C. S. NORDEN.
MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES.
APPLICATION FILED MAY 1, 1908.

1,023,954.

Patented Apr. 23, 1912.
2 SHEETS—SHEET 1.

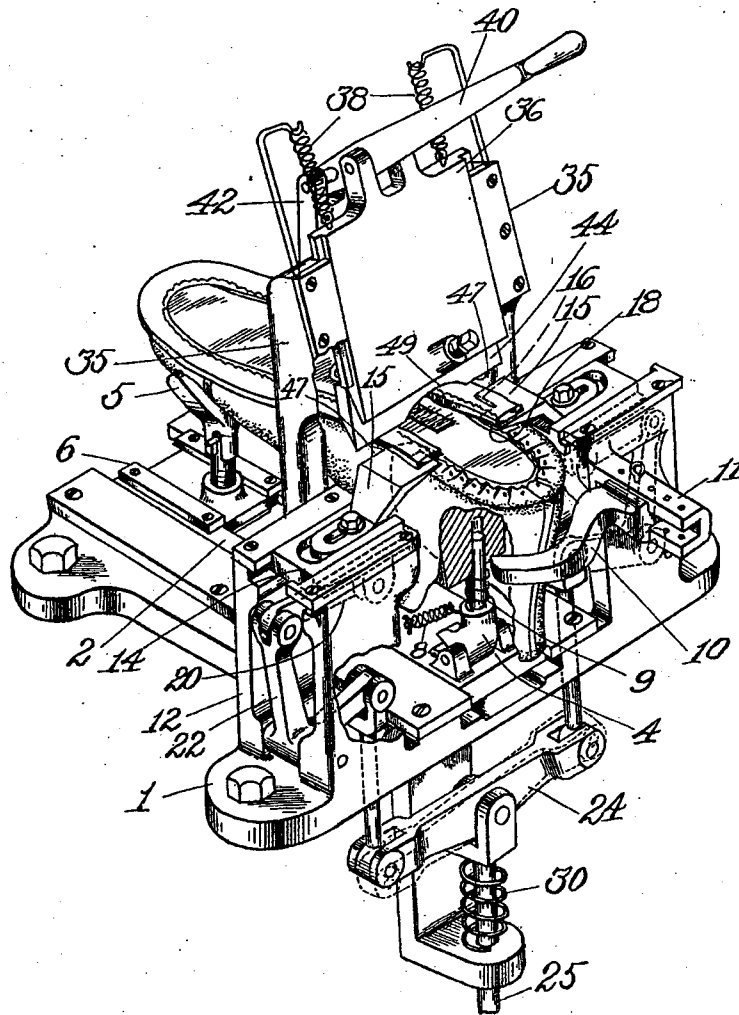
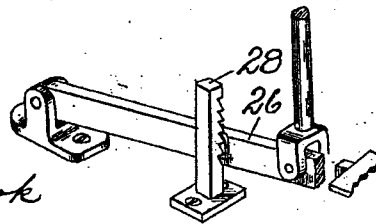


Fig. 1.

WITNESSES:

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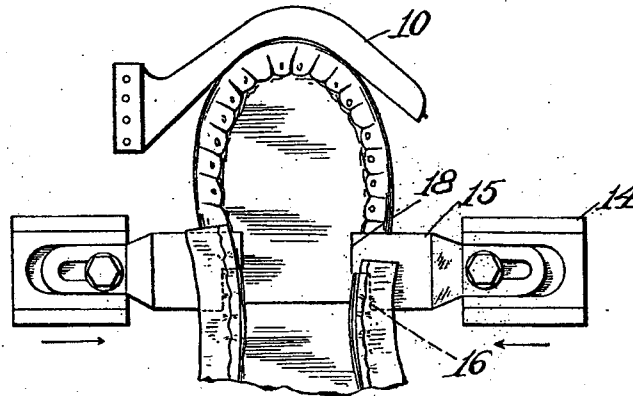


Fig. 2.

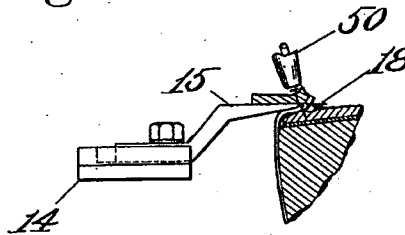


Fig. 3.

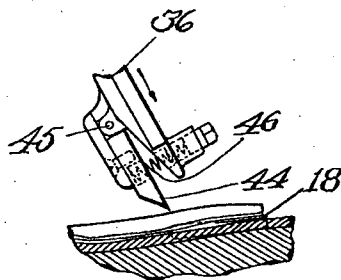


Fig. 4.

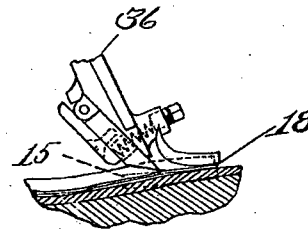


Fig. 5.

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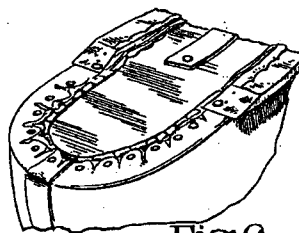


Fig. 6.

INVENTOR.
Carl S. Norden
By his Attorney,
Nelson M. Howard

1,023,954. MACHINE FOR USE IN THE MANUFACTURE OF BOOTS AND SHOES. CARL S. NORDEN, Lynn, Mass., assignor to United Shoe Machinery Company, Paterson, N. J., a Corporation of New Jersey. Filed May 1, 1908. Serial No. 430,332.

To all whom it may concern:

Be it known that I, CARL S. NORDEN, a subject of the King of Sweden, residing at Lynn, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Machines for Use in the Manufacture of Boots and Shoes, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for use in making shoes and particularly Goodyear shoes or "welt shoes," and has for its object to facilitate the manufacture of the shoe and improve its appearance. In this type of shoes the upper is permanently fastened to the innersole by lasting tacks at the heel seat and by stitches, called the "inseam," from at or near the front end of the heel stiffener on one side of the shoe around the forward portion to a similar point at the other side of the shoe. The requirements of the inseam sewing machine render it impracticable to begin the inseam close to the heel seat tacks on the one side or to extend it to the tacks on the other side of the shoe. A portion of the upper between the end of the seam and the row of tacks is therefore left on each side of the shoe to be fastened after the in-seaming operation. The heel stiffener is not usually shaped accurately to the last and for this and other reasons there will generally be found some slackness in the upper at and adjacent to those unsecured portions which can be pulled out and the fit of the shoe to the last thereby improved by tightening the upper over the edge of the last before fastening it. A narrow strip of strong leather called the welt is attached to the shoe by the in-seaming operation and forms an outstanding flange to which the outersole is subsequently attached. The ends of the welt project a short distance over the heel seat and it is the usual practice to bevel these end portions of the welt so that the outersole will fit smoothly upon them. This beveling operation is commonly called "butting" the welt. It is of course desirable that the two ends of the welt be butted off at the same distance from the heel end of the shoe, the preferred point being a little back of the heel breast line. Quite generally, however, it will be found that the inseam attaches the welt to the sole and upper farther back on one side of the shoe than on the other and at one or both ends the inseam is likely to

extend too far back because the sewing machine operator has no definite gage for beginning or ending the seam but depends upon his judgment. With these conditions in mind the present invention provides means for engaging the shoe to tighten the stock at and adjacent the front ends of the heel stiffener and to hold it conformed to the last while it may be fastened between the end of the inseam and the previously driven heel seat tacks, means butting the welt ends at suitable points, and means for freeing the several portions from the shoe in case the inseam extends back of the point where the welt is butted.

A very important feature of this invention consists in providing means for engaging previously lasted shoes at or adjacent to the end of the inseam or the row of end seat tacks, and tightening the shoe stock over the edge of the last and holding it in position to be fastened between the inseam and said tacks. Preferably the machine will be arranged to engage the shoe stock for a limited distance on the opposite sides of the shoe at the same time at or near the ends of the heel stiffener and conform the shoe stock to the contour of the last by pressing or otherwise forcing it inwardly with relation to the previously fastened portions of stock at the shank and at the heel of the shoe. The shape of a last usually differs on the two sides at the portion referred to, being more rounded on the inner side of the last, and the two engaging means which may advantageously be connected to a single actuator for movement together will preferably be arranged to permit the two devices to move through different distances depending upon the contour of the adjacent portion of the last and the amount of slackness in the engaged portion of the stock. For use on shoes having an outturned sole attaching flange, such as the welt shoe mentioned, the engaging devices will preferably be formed to engage the shoe stock in the crease between the flange or welt and the upper and by pressure upon the inseam draw the upper tightly over the last and force the heel stiffener snugly against the last.

The butt end portions of a welt do not always occupy the same position after the in-seaming operation but sometimes will be inclined outwardly to a greater or less degree and usually the end at which the seam was finished will project outwardly farther or in a different relation to the shoe than the other end. The engaging means is also, in accordance with another feature of the invention, arranged relatively to a welt butt cutter to position the portions to be cut uniformly relatively to each side of the shoe and uniformly on each shoe so that the beveled face formed by the cutter will have a predetermined relation to the shoe instead of

being inclined outwardly or inwardly more or less as would often be the case if the welt were not properly positioned. These shoe stock engaging devices hold the welt for the cutter to operate upon it and in accordance with a further feature of the invention include members or portions which are suitably formed to engage or bottom in the welt crease against the shoe stock and exert stock tightening pressure through such engagement, and also other members or portions that are formed to extend inwardly beyond the in seam and preferably to the inner edge of the welt so as to form a support for the full width of the welt in the cutting operation. These latter devices which form the support for the welt during the butting operation, may, in accordance with an important feature of this invention have cutting edges adapted to sever any stitches of the in seam that are located back of the butting point and connect the severed end of the welt strip to the shoe. This arrangement has the advantage that the severed portion is entirely freed from the shoe by the butting and the stitch severing cutters so that it readily falls out of the way and also that the welt supporting member is enabled to be easily positioned at any point

where it is desirable to butt the welt. The stitch severing cutters may also cut the between substance of the in seam, including the upper and the lip of the innersole so as to plane off the shoe bottom in the rear of the butted ends of the welt and form a smooth seat for the heel end of the outersole.

The welt butting mechanism herein illustrated as embodying the invention includes a novel cutting device which is a valuable feature of this invention. It comprises a blade having a cutting edge which is formed by a bevel on one side that is oblique to the direction of pressure for driving the blade and which is capable of movement, by contact of said bevel with the work, transversely of its length to produce automatically a slanting or skiving cut. As shown, although not necessarily, this movement of the cutting edge transversely of its length is facilitated by pivotally mounting the blade and providing yielding means separate from the blade for returning the blade to its normal position. Stops are here provided to limit the transverse movement which occurs during the cutting operation, and thereby to determine the maximum extent of the slant produced on the cut edge of the work, and also the return movement into starting relation to the direction in which its operating pressure is applied. As illustrated, the blade is mounted pivotally in a carrier which is movable in a predetermined path in guides that are inclined to the shoe bottom at an angle less than that at which it is desired to bevel the welt ends.

This arrangement permits the blade to tip automatically as it penetrates the stock and thereby increase the angle at which the welt is beveled. The arrangement may permit the angle to be changed as the cutting proceeds so that a concave skived edge will be formed on the end of the welt. Preferably the knife is formed as a single blade extending across the shoe bottom with sharpened portions at its ends and an intermediate blunt or non-cutting portion which preferably is located in a higher plane than the cutting portions and may be adapted to engage with the shoe stock between the welt ends and by such engagement to limit the depth at which the cutters can descend. The relative arrangement of the knives by which they cooperate as described is an important feature of this invention which is independent of the particular work which they are employed to cut.

These and other features of the invention including certain details of construction and combinations of parts will be more fully explained in the following description and pointed out in the claims.

Figure 1 is a perspective view of the machine. Fig. 2 is a plan view in substantially the plane of the transversely movable blades. Fig. 3 is a transverse section through the shoe, showing one of the blades in side elevation and illustrating its operative relation to the shoe. Fig. 4 is a view showing the shoe in longitudinal section and the welt butting cutter in end elevation, the cutter being raised from the work. Fig. 5 is a similar view showing the position of the parts when the cutter has severed the end portion of the welt. Fig. 6 is a view of the work as it comes from the machine.

The frame 1 of the machine, which is adapted to rest upon a bench or table, is provided with a longitudinal guideway in which a shoe supporting plate 2 is movable endwise. The plate has a pivotally mounted heel post 4 and a toe rest 5 carried by a slide 6 that is adjustable lengthwise of the plate 2 for shoes of different lengths. A spring 8 is arranged to tip the heel post 4 forwardly and rock the fore part of the shoe firmly down upon the toe rest. The spring 9 carried by the heel post provides for holding the heel portion of the shoe yieldingly upward against the devices which operate on the shoe. A back stop 10 is adjustably mounted in the projection 11 from the frame and is adapted to stop the endwise movement of the shoe backwardly in such a position that the end portions of the welt will be in suitable relation to the welt butting knife. The frame has uprights 12 provided with guideways extending transversely of the shoe in which are mounted blade carriers 14. Upon these blade carriers are adjustably secured the blades 15. These blades each have a thin

blunt edge portion 16 that is adapted to be forced into the crease between the welt and the upper, bottoming in said crease against the shoe stock or against the stitches connecting the welt and upper. The portion 16 exerts pressure upon the shoe stock to tighten the upper over the edge and bottom of the last and to position the end portion of the welt transversely with relation to the shoe bottom. Each blade also has a cutter 18 extending inwardly beyond the blunt portion 16 and adapted, as the blade is forced over the shoe bottom, to extend between the welt and the upper and cut any stitches which may connect the end portion of the welt to the upper and innersole. This cutting portion may plane off the stock on the bottom of the shoe level or even with the face of the upper so that when the end or surplus portion of the welt has been removed the shoe bottom will present a smooth seat for the heel portion of the outersole. While the portion of the blade having the blunt edge and the portion having the sharpened edge are shown as integral and this construction is preferred, it would be within the present invention to form these two parts as separate devices arranged for relative adjustment or for relative movement during their operation. The blade carriers 14 are each connected by a link 20 with a bell crank 22 fulcrumed in the frame and connected by a suitable link with an equalizing device 24, from which extends a rod 25 to a treadle 26. The treadle is arranged for engagement with a ratchet 28 by means of which it may be locked in its depressed position for causing the blades 15 to continue to hold the upper tightened over the last and the end portions of the welt suitably positioned during the welt butting and tacking operations. The equalizing lever 24 permits the blades to be moved inwardly different distances according to the position and the shape of the two sides of the last. A spring 30 serves to raise the rod 25 and retract the blades when the treadle is released from the ratchet. In addition to the uprights 12 the frame supports uprights 35 that contain guideways in which the knife carrier 36 is movable obliquely downwardly and backwardly from its raised position, in which the shoe is inserted, into position for causing the knife to sever the end portions of the welt from the body of the shoe. The knife carrier is raised by springs 38 and is depressed, as herein shown, by a hand lever 40 pivoted to the upper end of the carrier and having a pin and slot connection with the ears 42. Welt butting knife 44 is pivotally connected at 45 with the carrier and arranged to rock about said pivot in a direction transverse to its cutting edge. The knife is shown as of chisel formation with the beveled face on its under side and in cutting through it

welt the knife swings as indicated in Fig. 5 to increase the angle or inclination at which the cut is formed. This arrangement is such that the knife engages and enters the stock by a movement at a small angle to the perpendicular and as it cuts through the welt the knife moves into a position at a greater angle to the perpendicular for increasing the bevel formed by it. A spring 46 normally holds the knife in the position shown in Fig. 4. The knife is shown as provided with two cutting portions 47, one at each end, to sever the two end portions of the welt, and with an intermediate blunt portion 49 which may serve as a stop to limit the depth of the cut formed by the knife in the event that no other limiting means is provided. Preferably this blunt portion is curved upwardly, as shown in Fig. 1, to adapt it to the formation of the shoe bottom upon which a shank is secured.

In the use of the machine the shoe is placed upon the support when the latter is in a forward position and is then thrust backwardly until it is stopped against the back rest 10, the latter being suitably adjusted so that the end portions of the welt will be under the welt butting knife 44. When the shoe is in this position the end portions of the heel stiffener at the sides of the shoe will be approximately opposite the blades 15. As the shoe is thrust backwardly the heel end is depressed against the tension of the spring 9 to position the shoe bottom at the right altitude with relation to the shoe. The blades enter the rand crease, the blunt portion 16 bottoming against the stock or the stitches of the insole and exert inward pressure at or adjacent to the end portions of the heel stiffener for forcing the upper inwardly over the last bottom, particularly in the space between the end of the insole and the end tack in the row of heel seat tacks. If one blade engages the shoe before the other its movement will be arrested while the equalizing device 24 rocks to permit the other blade to come up to the shoe, after which the two blades will simultaneously force the upper inwardly through the two sides of the shoe and will position the end portions of the welt with relation to the shoe bottom and to the welt butting knife. During the inward movement of the blades 15 the cutters 18 cut their way through any stitches of the insole which may connect the welt to the shoe back of the points where the welt should be butted off, thus detaching or freeing the end portions of the welt from the insole. If the lip of the innersole or the upturned portion of the upper lies in the path of the blade 15 such parts will be planed off and the heel seat thus leveled so that it will present no projections above the normal surface of the heel portion of the shoe, and will permit the heel seat end of

the sole to be laid snugly upon the shoe bottom.

It is to be observed that the cutters 18 move lengthwise of the cutting edge of the knife 44 and serve to detach from the shoe the lower side of the portion of surplus welt that is to be removed. The cutters 18 remain under the welt and under the knife 44, forming a cutting bed against which the knife 44 moves. The pressure exerted by the blades can be varied by the treadle and the blades can be moved inwardly for exerting pressure against the in-seam and thrusting the knives forwardly a plurality of times if desired. The spring 9 holds the shoe firmly up to the action of the blades at all times. When the stock has been suitably tightened into the position in which it is to be secured and the end portions of the welt properly located for the welt butting operation the treadle is locked for holding the stock during the butting and tacking

operations. The lever 40 is then depressed, forcing the knife 44 downwardly until it engages the upper face of the welt. Thereafter, in the further depression of the lever, the knife moves downwardly and at the same time swings backwardly from the position shown in Fig. 4 to that shown in Fig. 5 so that it bevels off the butt ends of the welt. Another function performed by the knife during its progress through the work and its swinging movement is to force rearwardly the end portion of the welt which is severed by it, tending to loosen and throw off this surplus portion of the welt. The spring 38 raises the knife carrier when the handle 40 is released and the spring 46 restores the knife to its normal relation to the carrier.

It will be observed that in the preferred arrangement shown, especially in Figs. 4 and 5, the cutters 18 and 44 are so arranged that the butting knife engages the welt in advance of the portions supported by the cutter 18 and cuts downwardly and backwardly to and against the cutter 18 near the forward edge of the latter, so that while the stitches connecting the surplus portion of the welt are all severed the remaining beveled end portion of the welt is not loosened from the in-seam. The return or upward movement of the knife 44 and its carrier uncovers the skived end portions of the welt and gives convenient access to these portions of the welt and adjacent portions of the shoe stock to permit the stock to be fastened, as by the tacker 50, while the stock is held under tension and suitably positioned by the blades 15. When the several operations have been completed the treadle is freed from the ratchet 28, the support or jack advanced to permit the shoe in the condition shown in Fig. 6 to be removed and another lasted and welted shoe applied and

positioned for treatment.

Having explained the nature of this invention and described a preferred construction embodying the same I claim as new and desire to secure by Letters Patent of the United States.

1. A machine of the class described having means for tightening the upper of a welted shoe adjacent to the ends of the heel stiffener at the opposite sides of the shoe simultaneously and holding it under tension while it is operated upon combined with means for butting the welt.

2. A machine of the class described having means for butting a welt, devices movable transversely of the shoe and relatively to the butting means for positioning the welt relatively to the butting means, and operating means having provision for actuating said welt positioning devices repeatedly to effect proper positioning of the welt

ends prior to the actuation of the butting means.

3. A machine of the class described having means for engaging a shoe in the welt crease, a welt butting cutter, actuating mechanism for causing the engaging means to tighten the upper over the last and hold it under tension while the welt is butted and the upper fastened, said actuating mechanism being arranged to permit repeated upper tightening operations prior to the actuation of the welt butting cutter.

4. A machine of the class described having means for engaging a shoe in the welt crease to tighten the upper over a last and position the butt end of the welt, a cutter, and mechanism constructed and arranged to advance the cutter for butting the welt and then retract the cutter to permit the ends of the welt to be fastened while the shoe remains in a single position.

5. In a welt butting machine a shoe support, a cutter, a carrier for the cutter movable toward and from the shoe, and a connection between the carrier and the cutter arranged to permit the latter to rock relatively to the former during the cutting operation.

6. In a welt butting machine a shoe support, a cutting blade, a carrier for the blade, slideways in which the carrier is movable toward and from the shoe, and a connection between the carrier and the blade arranged to permit the latter to move transversely of its cutting edge during the cutting operation.

7. In a welt butting machine a shoe support, a cutting blade, a carrier for the blade, slideways in which the carrier is movable obliquely toward the work, and connection between the blade and its carrier arranged to permit variation in the angle at which the welt is cut.

8. A machine of the class described having a knife carrier, a cutting blade and a connection between the carrier and blade arranged to permit the blade to rock relatively to the carrier and transversely to its cutting edge during the cutting operation.

9. In a machine of the class described, the knife carrier 36, the rocking blade 44 and the spring 46 for holding the blade in normal relation to the carrier.

10. A machine of the class described comprising a flat blade beveled on one side for cutting, a pivot for said blade arranged to permit rocking movement thereof toward the other side during the cutting operation a spring and stop for determining the normal position of said blade, and a second stop to limit the rocking movement thereof.

11. In a machine of the class described the combination with a welt butting cutter movable downwardly toward the shoe bottom, of a stitch cutter movable inwardly from the side of the shoe.

12. In a machine of the class described, the combination with a welt butting cutter, of a stitch cutter and actuating mechanism arranged to permit the stitch cutter to be operated in advance of the welt cutter.

13. In a machine of the class described, the combination with a welt butting cutter, of a stitch cutter arranged for movement under the welt in advance of the welt cutter and adapted to form a cutting bed for the welt cutter.

14. In a machine of the class described, the combination with the cutter 44, of the cutter 18 arranged in the path of the cutter 44 for movement lengthwise of the edge of cutter 44.

15. In a machine of the class described, the blades 15 having opposed cutting edges, the bell cranks 22, the equalizer 24 to permit the blades to adjust themselves separately to the work, and the actuator 26 for forcing the cutting edges into the work simultaneously.

16. In a machine of the class described, the member 15 having an attaching portion, an upwardly inclined neck, and a working portion comprising the pressure applying edge 16 and the stitch cutting edge 18.

17. In a machine of the class described, a welt butting blade constructed and arranged to skive simultaneously the two ends of a welt on a lasted shoe and having two straight cutting edges and an intermediate arched formation to extend over a transversely arched formation of the shank of the lasted shoe.

18. In a machine of the class described, a welt butting blade having the cutting edges 47 and 47 and a stop arranged to engage the shoe stock and limit the depth of the cut formed by said edges.

19. A machine of the class described having welt positioning means, a welt cutter, means to advance the cutter to butt the welt and to retract the cutter to permit the shoe

stock to be tacked, and means adapted to cause the positioning means to continue to hold the welt during the butting and tacking operations.

20. A machine of the class described having a welt butting cutter and means for imparting to said cutter a stroke of indefinite length, combined with a guard plate arranged transversely of the path of the cutter to extend from the side of the shoe under the butt end of the welt beyond the path of the cutter to limit the stroke of the cutter.

21. A machine of the class described having a welt butting cutter adapted to have a stroke of indefinite length, combined with a sharpened guard plate and actuating means for causing the plate to force its way

under the welt to a position in the path of the welt butting cutter to limit the stroke of the cutter.

22. A welt butting machine having a cutter and mechanism for actuating the cutter to butt the welt on a bevel, said machine having provision for actuating the cutter toward the welt in a right line and then changing the angle of the cutter to the stock after the cutter has entered the welt.

23. A welt butting machine having a cutter, and operating means arranged to actuate the cutter into the stock in a direction which is at a small angle to the face of the stock and is adapted to cause the cutter to penetrate the stock easily and then to change the direction of movement and actuate the cutter through the stock at a greater angle to the face of the stock.

24. A machine of the class described having devices arranged at either side of a welted shoe to overlie the shoe bottom in a plane between the welt and the innersole and means for actuating said devices to remove surplus stock from the shoe bottom, said machine having provision for permitting repeated operations of said devices upon the same shoe, and means for holding the shoe yieldingly up against said devices.

25. A machine of the class described, having, in combination, the blade 15 having the forward insole pressing edge 16 and the rear stitch cutting edge 18, and the vertically yielding shoe support, said blade and support being relatively arranged for movement laterally to cause the blade to do its work.

26. A machine of the class described, having, in combination, the knife carrier 36, the knife 44, the connecting pivot 45 extending substantially parallel with the cutting edge of the knife, and means for actuating the knife carrier toward and from the stock in a direction to tend to cause the knife to turn on its pivot after engaging the stock.

27. A machine of the class described, having, in combination, the knife carrier 36, the knife 44, the connecting pivot 45 ex-

tending substantially parallel with the cutting edge of the knife, the spring 46 arranged to maintain a normal relation of the knife to the carrier, and means for actuating the carrier in a direction to tend to cause the knife to turn in opposition to the spring after the knife begins to cut the stock.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CARL S. NORDEN.

Witnesses:

GEO. COLEMAN,

ARTHUR L. RUSSELL.