S. J. WENTWORTH.

HEEL SEAT FORMING MACHINE.

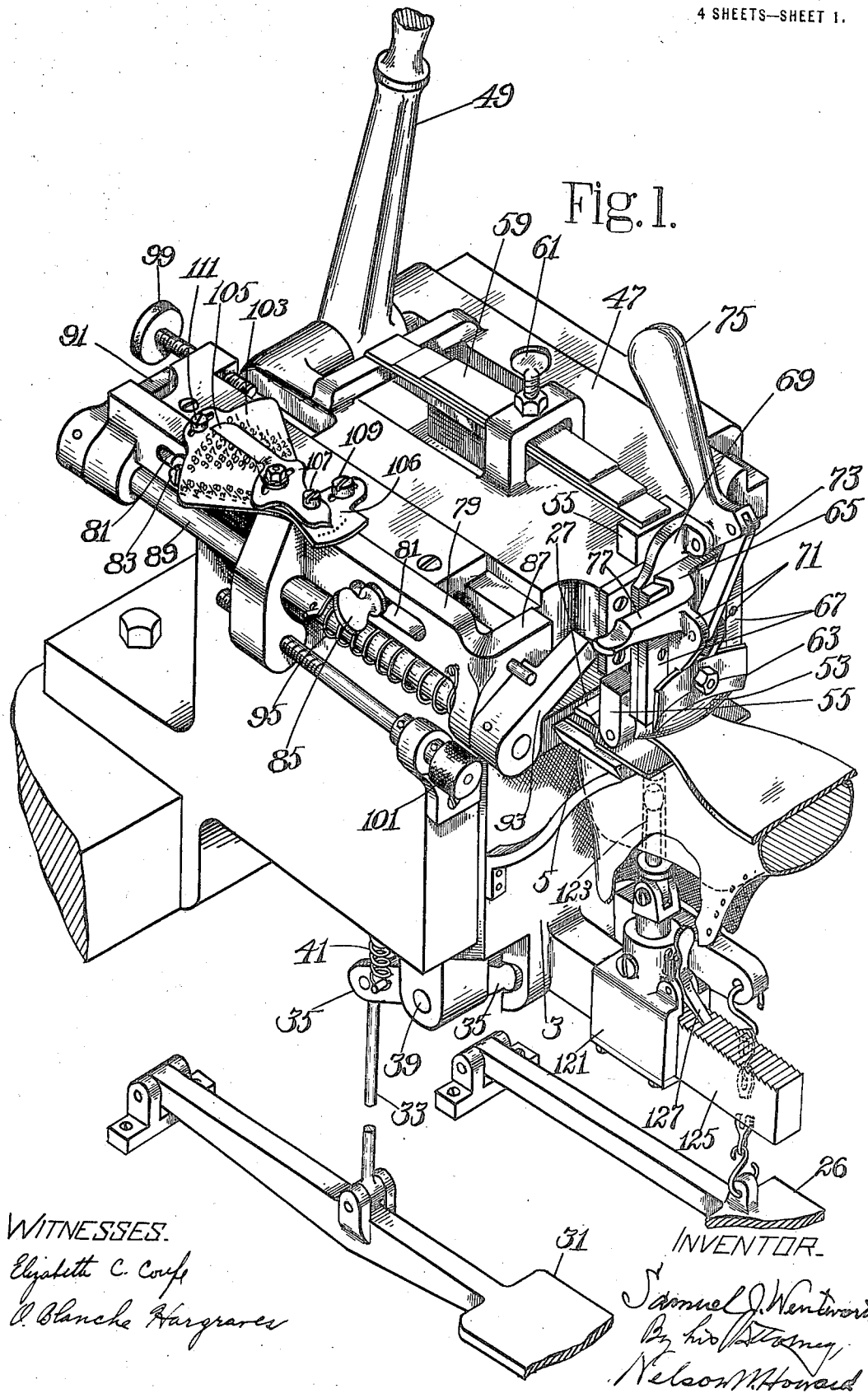
APPLICATION FILED DEC. 4, 1914. RENEWED JAN. 4, 1919.

1,307,284.

Patented June 17, 1919.

4 SHEETS—SHEET 1.

Fig. 1.



WITNESSES.

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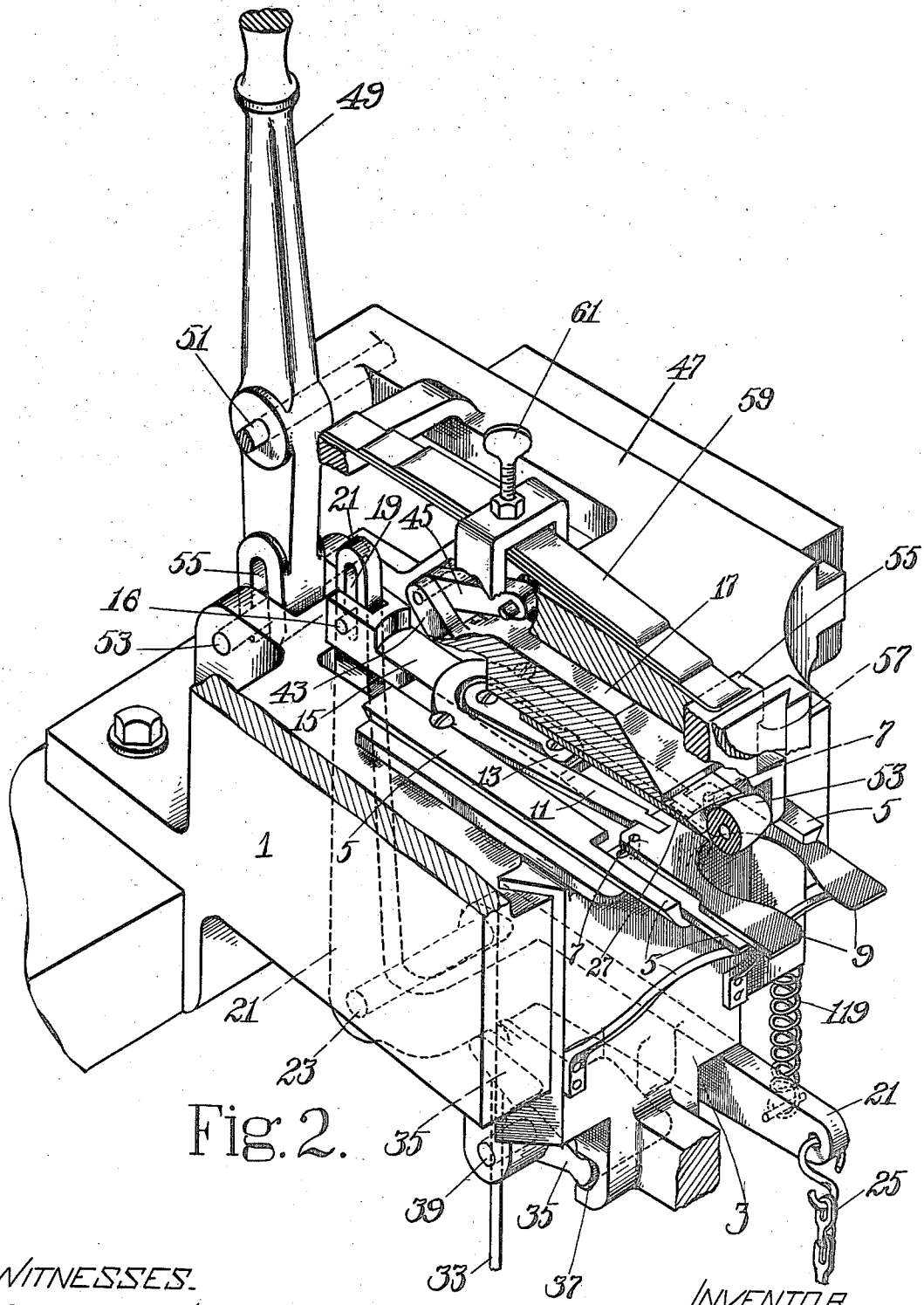


Fig. 2.

WITNESSES.

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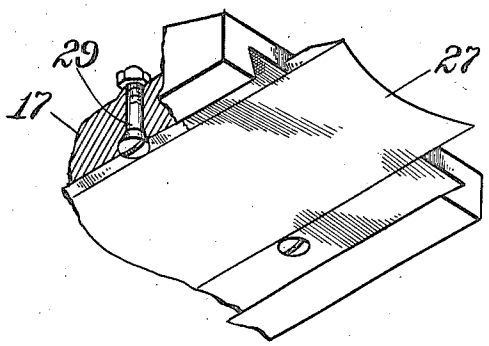


Fig. 3.

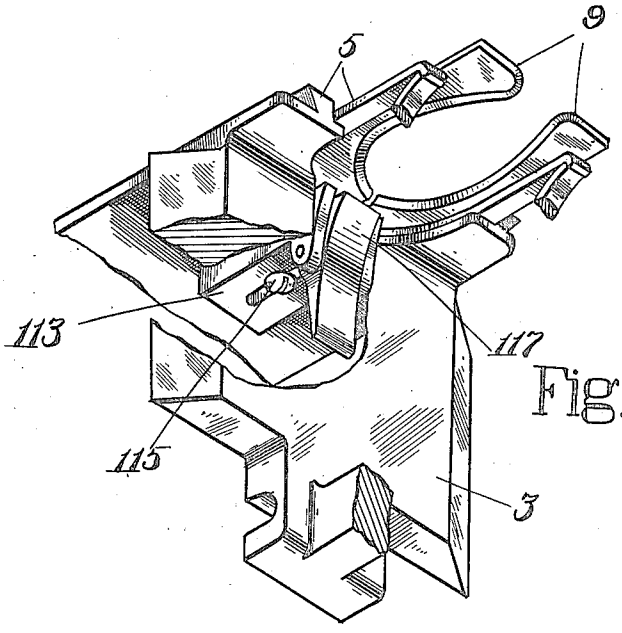
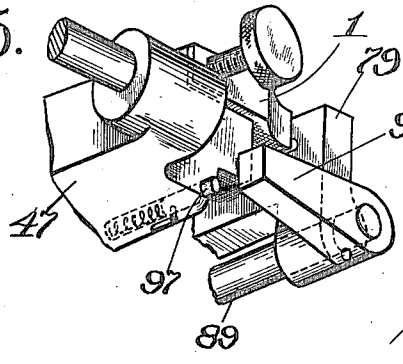


Fig. 4.

Fig. 5.



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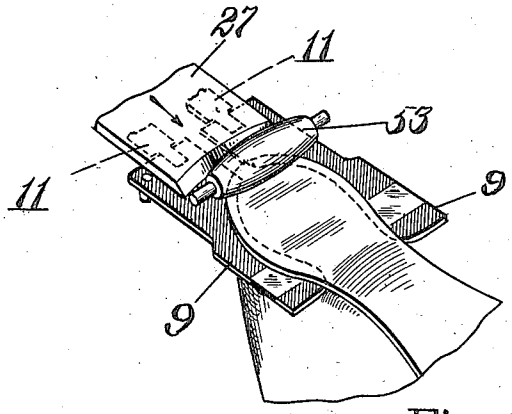


Fig. 6.

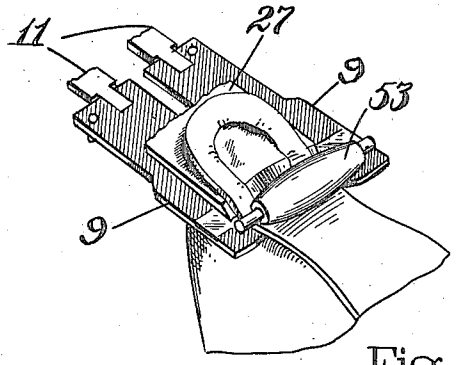


Fig. 8.

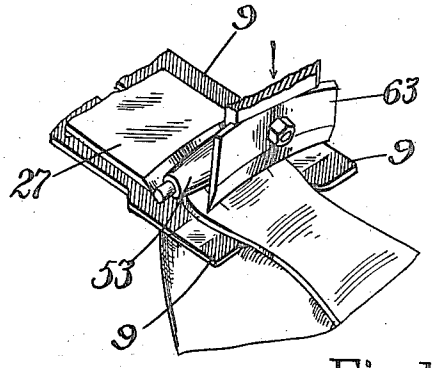


Fig. 10.

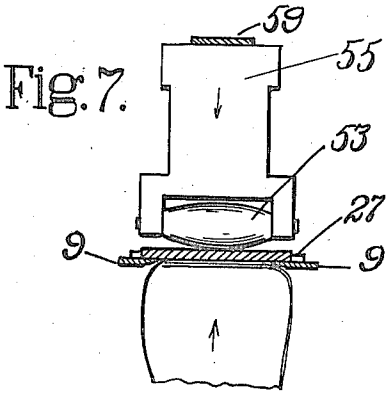


Fig. 7.

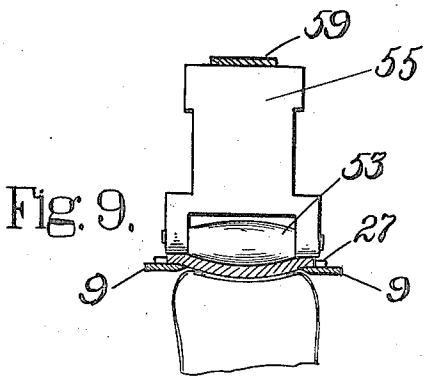


Fig. 9.

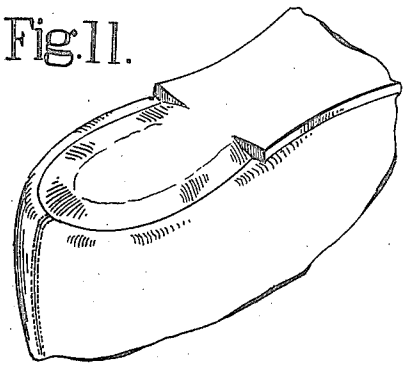


Fig. 11.

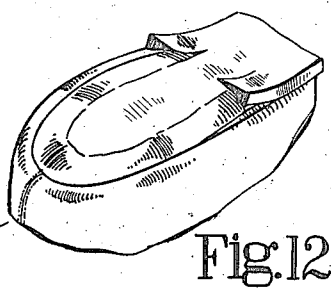


Fig. 12.

WITNESSES.

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UNITED STATES PATENT OFFICE.

SAMUEL J. WENTWORTH, OF NEWPORT, KENTUCKY, ASSIGNOR, BY MESNE ASSIGNMENTS, TO UNITED MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HEEL-SEAT-FORMING MACHINE.

1,307,284. Specification of Letters Patent. Patented June 17, 1919.

Application filed December 4, 1914, Serial No. 875,468. Renewed January 4, 1919. Serial No. 269,655.

To all whom it may concern:

Be it known that I, SAMUEL J. WENTWORTH, a citizen of the United States, residing at Newport, in the county of Campbell and State of Kentucky, have invented certain Improvements in Heel-Seat-Forming Machines, 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 a machine for operating upon the rear portion of a sole and is herein illustrated as embodied in a machine for forming upon the heel portion of the sole of a shoe a convex heel seat to receive a cavity in the heel which is to be attached.

In the manufacture of shoes having leather heels it is customary to attach the rough heel and then to trim the heel and the edge of the heel portion of the sole simultaneously and later to scour and burnish them.

With wooden heels, however, this procedure is not practicable since to trim a wooden heel and the edge of a leather sole simultaneously in a satisfactory manner would be difficult. Moreover a wooden heel is commonly covered with a thin veneer of leather which can not be subjected to the scouring operation without injury. Accordingly wooden heels are completely finished before being attached; and the edge of the heel portion of the sole of the shoe is trimmed off so as to permit the upper edge of the heel to extend close to the upper of the shoe. A wooden heel has a concavity in its upper face; and the trimming of the heel portion of the sole is such as to provide a convex heel-seat to receive this concavity, the forward end of the seat commonly terminating in a shoulder against which the upper forward end of the heel may abut so as to position the heel properly lengthwise of the sole and to form a smooth joint where the breast of the heel joins the shank of the sole, wooden heels being usually of the Louis type. Hitherto this operation of forming a convex heel-seat has been performed manually by cutting off the edge of the heel portion of the sole, the operator being guided entirely by his eye. The formation of heel-seats in this manner, however, is slow and the results are not uniform.

The general object of the present invention is to provide a machine for performing this and similar operations.

An important feature of the invention comprises means for cutting the margin of the heel portion of the sole on a bevel to provide a convex or raised face to receive the cavity in the upper face of the heel and for producing a shoulder against which the upper forward end of the heel may abut. In the illustrative machine the projecting margin of the heel portion of the sole is supported by jaws which engage the rand crease; the heel portion is then distorted by a presser which engages the middle part of the heel portion, and this presser, together with a trimming knife, is moved along the sole from the extremity of the heel to a point determined by the length of the heel which is to be attached whereby a horseshoe-shaped tongue substantially triangular in cross-section is formed on the sole. A cutting-off knife then removes this tongue so that when the shoe is removed from the machine and the sole resumes its normal position a convex heel-seat terminating in the desired shoulder or shoulders results. With this mechanism the shape of the presser determines the shape of the resulting heel-seat; and all heel-seats made with the use of a given presser will be substantially uniform.

Inasmuch as heels differ in length it is desirable to be able to control the length of the heel-seat which is formed. Another feature of the invention comprises means for varying the length of said convexity and consequently the length of the heel-seat produced.

These and other features of the invention will be described in connection with an illustrative machine and pointed out in the appended claims.

Referring now to the accompanying drawings,—

Figure 1 is a perspective of an illustrative machine in which the invention is embodied;

Fig. 2 is a perspective of a portion of the machine, certain parts having been omitted and others broken away;

Fig. 3 is a perspective showing the mounting of the trimming knife.

Fig. 4 is a perspective showing the block 3, the bracket 5 and the relation of the jaws to the rest against which the heel portion of the upper of the shoe is held.

Fig. 5 is a detail perspective of the stop mechanism for locating the cut of the cutting-off knife with respect to that of the trimming knife;

Figs. 6 to 10 show various steps in the operation of forming the heel-seat;

Figs. 11 and 12 show two forms of heel-seat either of which may be produced.

Before proceeding to a detailed description of the mechanism of the illustrative machine reference is made to Figs. 6 to 12, inclusive, wherein its mode of operation is clearly shown. The purpose of the machine is to form a heel-seat such as that shown in Fig. 11 or Fig. 12, the two heel-seats shown differing merely in that the one shown in Fig. 12 has two short tongues beneath which the forwardly extending lip of a Louis heel may be inserted while in the one shown in Fig. 11 such a lip abuts against two shoulders formed at the margin of the sole. The particular form desired depends upon the preference of the manufacturer; and the illustrative machine can be made to produce either.

The shoe with the sole attached is supported by two jaws 9 which enter the rand crease and engage the projecting margin of the heel portion of the sole. The trimming knife 27 rests upon the jaws at the rear of the sole, and the presser 53, at the time the shoe is presented, is above the end of the sole said presser being yieldable vertically against the force of a heavy spring 59. With the parts in this position the operator, by means presently to be described, raises the jaws and knife thereby bringing the sole into contact with the presser and raising it against the force of the spring 59. This is the position shown in Figs. 6 and 7.

The trimming knife 27 and presser 53 are next caused to traverse the heel portion of the sole with the result shown in Figs. 8 and 9, the presser under the force of the spring 59 distorting the sole and the trimming knife 27 forming a horseshoe-shaped tongue as shown in Figs. 8 and 9. When the limit of this traversing movement has been reached the trimming knife 27 and presser 53 are retracted until the edge of the cutting-off knife 63 is over the end of the cut of the trimming knife, if the result shown in Fig. 11 is desired, or is over a point nearer the heel end of the sole if the result shown in Fig. 12 is desired. The position of the parts in which the result shown in Fig. 11 will be produced is illustrated in Fig. 10. The cutting-off knife 63 is next operated, after which the trimming knife and presser are retracted farther so as to permit the shoe to be removed.

With this brief outline of the general mode of operation of the machine reference is now made to the remaining figures and more particularly to Figs. 1 and 2.

Movable in vertical guideways in the frame 1 of the machine is a sliding block or carrier 3 upon which is fast a bracket 5. The rear portion of this bracket is herein shown as integral with the carrier 3 and the front portion as attached to it but the particular construction is immaterial. Pivoted to this bracket at 7 are a pair of jaws 9 the purpose of which is to support the shoe and to guard the upper from injury by engaging the upper side of the projecting margin of the heel portion of the sole. Said jaws are engaged by the free ends of a horseshoe-shaped spring 11 which is carried by the bracket 5. The pivots 7 extend into slots in said bracket so that the jaws 9 may be separated when desired to permit the heel portion of a shoe to be placed between them. In order to provide for such separation when desired a cam 13 located between the arms of the horseshoe spring 11 is fast to a slide 15 mounted in the bracket 5, said slide being connected by a pin and slot 16, 19 to a bell-crank lever 21 which may be swung about a fixed axis 23 by exerting a downward pull on a chain 25 to which a treadle 26 is connected.

Slidably mounted upon the bracket 5 and extending over the slide 15 is a knife block 17 to which the trimming knife 27 is adjustably fastened by bolts one of which is shown at 29 (see Fig. 3). The jaws 9 and the trimming knife 27 are carried primarily, it will be noted, by the vertically sliding block or carrier 3 so that when said carrier is raised both the jaws and the knife are raised with it. The raising of the carrier 3 is accomplished by depressing a treadle 31 connected by a rod 33 with a lever 35 one arm of which engages a socket 37 in the carrier 3, said lever being pivoted at 39 to the frame of the machine and being normally held in the lowered position shown by a spring 41.

The trimming knife block 17 has at its rear end an arm 43 which is pivoted to one end of a link 45, the other end of said link being pivoted to a slide 47 which is guided in the frame of the machine and carries, in a manner presently to be described, the presser roll and cutting-off knife. This slide 47 is herein shown as operated by a lever 49 pivoted at 51 to said slide and having a pin and slot connection 53, 55 with the frame of the machine. It should be noted that depression of the treadle 31 raises the jaws 9 and the trimming knife 27, and that thereafter forward or backward movement of the slide 47 carries the trimming knife but not the jaws with it.

The presser, herein shown as a roll 53, is rotatably mounted between the arms of a

yoke 55. The stem of said yoke is vertically slidable in a slot in the slide 47, there being a shoulder 57 to limit the extent of the downward movement of said yoke and consequently of said roll. A strong leaf spring 59, the tension of which may be varied by turning the screw 61, urges the roll downwardly at all times. The function of this roll, as has been explained, is to depress the middle of the heel portion of the sole while the projecting margin is supported by the jaws 9 whereby the heel portion of the sole is distorted, an undulation being formed in it, so that when the trimming knife 27 is moved forwardly the margin of the heel portion of the sole will be beveled as shown in Figs. 11 and 12. A convexity is thus imparted to the heel portion which corresponds to the concavity of the heel which is subsequently attached. Referring to Fig. 8 attention is directed to the relation of the ends of the arms of the yoke to the roll. The lower ends of these arms aid in holding the sole by pressing the projecting margin against the corrugated upper surface of the jaws 9.

The curved cutting-off knife 63 (see Fig. 1) is fast to a slide 65 which is vertically movable in guides 67 fast to a bracket 69, said slide having ears 71 to which is pivoted the lower end of a link 73, the upper end of said link being pivoted to a projection on a lever 75 which in turn is pivoted to the bracket 69. A spring, not shown, located between an arm 77 and the slide 47 tends to maintain the cutting-off knife 63 in raised position.

It is desirable at times to produce the cut illustrated in Fig. 11 and at others that produced in Fig. 12. In the first instance the cut of the cutting-off knife registers with the line of extreme forward movement of the trimming knife. In the second instance the cut of the cutting-off knife takes place to the rear of the line of extreme forward movement of the trimming knife. Considering first the first instance, the movement of the slide 47 is regulated in the following manner: Slidably mounted at the side of the frame of the machine (see Fig. 1) is a bracket 79 said bracket being provided with slots 81 through which extend screws 83 and 85, the last-named screw serving also to lock the bracket in adjusted position. A stop 87 on said bracket serves to limit the forward movement of the slide 47 and consequently of the slide 17 and the trimming knife 27. Rotatably mounted in bearings in the bracket 79 is a rod 89 having fast to its ends fingers 91 and 93, said rod being normally held in the position shown, with the fingers raised, by the coiled spring 95 one end of which is fast to the rod and the other to the bracket 79. In the position of the parts shown in Fig. 1 the slide 47 has reached its forward position and the trimming knife 27 has finished its cut. It will be noted, however, that the cutting-off knife is a considerable distance in advance of the edge of the trimming knife and that the slide 47 must be retracted a distance equal to the distance between the edges of the two knives. The purpose of the finger 91 is to arrest the backward movement of the slide 47 when this distance has been traversed. As will be seen from an inspection of Fig. 5 the finger 91 is held by the coiled spring 95, when possible, in the path of the slide 47. After the slide 47 has been moved backwardly until it is stopped by the finger 91 the lever 75 is manipulated to operate the cutting-off knife 63. At this time the arm 77 is directly over the finger 93, and as the arm descends it encounters the finger 93 thereby rocking the rod 89 and swinging the finger 91 below and out of the path of the slide 47. In order to hold the finger 91 in this position a spring-pin 97 (see Fig. 5) is mounted in the slide 47. This pin contacts with the finger 91 when the slide 47 is moved backwardly and is thereby pushed back into its socket; but, when the rod 89 is rocked to swing the finger 91 out of the path of the slide 47, the pin is forced out of its socket so as to engage the upper side of said finger 91 and hold it out of the path of the slide 47. Said slide may then be moved farther back until it contacts with the stop screw 99. The machine is then ready to receive another shoe.

The adjustment of the bracket 79 to determine the extent of cut of the trimming knife 27 is accomplished by loosening the thumb screw 85 and turning the adjusting screw 101. In order to facilitate this adjustment a scale 103 is fastened to the bracket 79 and a pointer 105 is fastened to a plate 106 which is pivoted at 107 to said bracket and at 109 to the frame of the machine. It will be noted that the scale is fastened to the bracket by a set screw 111 which passes through a curved slot in said scale, and that the pointer 105 is fastened in a similar manner to the plate 106. These adjustments are provided to facilitate proper setting of the pointer with respect to the scale.

Referring now to Fig. 4, a bracket 113 is adjustably fastened to the slide 3 or to that part of the bracket 5 which is integral with the slide 3 beneath the rear ends of the jaws 9 by a set screw 115 which passes through a slot in said bracket; and to this bracket is pivoted a rest 117 against which the rear end of the shoe is held during the operation of the machine. It should be noted that the position of the rest determines the position of the shoe longitudinally with respect to the jaws 9 and therefore the point at the rear end of the sole at which the presser first becomes effective to distort said sole. Consequently, by adjusting the stop the amount

of material removed from the rear end of the sole by the trimming knife may be varied. The position of this rest or stop also affects the location of the cut of the knife 63.

The operation of the machine, as thus far described, will now be described. The treadle 26 is depressed to open the jaws 9, a shoe is presented to said jaws with its rear end against the rest 117 and the treadle 26 released. The jaws then, under the influence of the spring 119, grip the shoe at the rand crease, as shown in Figs. 1, 6, 8 and 10 the jaws extending beneath the projecting margin of the sole at the heel portion and thereby supporting said portion and with it the shoe. The treadle 31 is then depressed to raise the slide 3 and with it the shoe, the presser roll, trimming knife, jaws and shoe being then in the position shown in Figs. 6 and 7. Next the lever 49 is moved forward to cause the presser-roll and trimming knife to traverse the heel portion of the sole. The position of the parts during this movement is shown in Figs. 8 and 9 from which it will be seen that the presser-roll, under the influence of the spring 59, distorts the sole of the shoe by depressing the middle part between the jaws 9. The sole is thus cut or trimmed, as shown in Fig. 8, to form a horseshoe-shaped tongue substantially triangular in cross-section. After the slide 47 contacts with the stop 87, the lever 49 is swung backwardly. This brings the spring pin 97 (see Fig. 5) against the finger 91 thereby pushing said pin into its socket, and moving the rear of the slide 47 against said finger 91. The arm 77 is now above the finger 93 so that when the lever 75 is manipulated to bring down the cutting-off knife the finger 93 is depressed. This rocks the rod 89 and depresses the finger 91 below the path of the slide 47 whereupon the pin 97 is forced out by its spring and holds the finger 91, depressed. The lever 75 and the treadle 31 are then released, the slide 47 moved backwardly until stopped by contact with the stop screw 99, the treadle 26 depressed and the shoe removed.

As thus far described the distance through which the slide 47 is moved backwardly from its extreme forward position to the position in which it is arrested by the finger 91 is equal to the distance from a projection on the sole of the forward edge of the trimming knife 27 to the edge of the cutting-off knife 63. The result thus produced is illustrated in Fig. 11. It is sometimes desirable, however, that the trimming knife should advance beyond the cut of the cutting-off knife 63 as illustrated in Fig. 12 so that the forwardly extending lip of a Louis heel may be inserted beneath the short tongues formed at the margin of the sole. To produce this result the trimming knife 27 is adjusted into a position nearer the cutting-off knife so that the first backward movement of the slide 47 is of greater extent than the distance from a projection on the sole of the edge of said trimming knife to the cutting-off knife.

It should be noted, in either case, that while the distance between the edge of the trimming knife and a projection on the sole of the edge of the cutting-off knife remains unchanged throughout the operation of the machine, the extent of cut of the trimming knife 27 may be varied to prepare the heel-seat to receive heels of different lengths by loosening the thumb screw 85 and turning the adjusting screw 101 to move the bracket 79 to a new position.

As thus far described the shoe is held by the operator in contact with the rest 117 against the force of the action of the trimming knife. It may be desirable, however, to provide other holding means. In the use of the machine the shoes may come to the operator with or without lasts. In Fig. 1 a shoe containing a last is shown as held by a jack 121 having the usual pin 123 which is received in the pin hole of the last. The jack is slidably mounted on an extension 125 of the slide 3 and is provided with teeth with which a pawl 127 is pivoted to the jack coöperates. When, therefore, the shoe has been placed as shown it will be securely held until such time as the operator may release the pawl. It should be noted that the jaws 9 support the shoe vertically, so that when the presser roll 53 traverses the sole the distortion shown in Fig. 9 will result.

In the illustrative machine the jack and the last are separate but it should be understood that if the shoe comes to the operator without the last, a jack of different form could obviously be used.

Although for purposes of illustration the invention has been set forth as embodied in a particular machine of the type in which the work is held stationary while bodily movable knives perform the cutting operation, it should be understood that the invention is not limited in the scope of its application to the particular machine or type of machine which has been shown and described.

The cavity in the top of the heel which is to be attached generally presents a true concave surface, but the surface of the heel seat is generally not truly convex. The terms concave and convex, however, have been used to promote brevity since these terms define the formations with sufficient clearness, and since it is obviously immaterial whether the surfaces referred to are truly convex and concave.

Having thus described my invention, I claim as new and desire to secure by Letters Patent of the United States:

1. A machine for forming upon the heel

portion of a sole a seat to receive the upper portion of the heel which is to be attached, having, in combination, means for cutting around the margin of the heel portion on a bevel, means for cutting in a direction at an angle to the direction of the first cut, and means for operating said cutting means.

2. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting the shoe, means for beveling the heel portion of said sole to provide a convex seat to fit the concavity of the heel which is to be attached, and means for varying the length of said convex seat.

3. A machine for forming upon the heel portion of a sole a seat to receive the upper face and upper forward end of a heel which is to be attached, having, in combination, means for making a horseshoe-shaped cut around the heel end of the sole to provide a face to receive the upper face of the heel, and means for producing a shoulder at the ends of the legs of the horseshoe to provide an abutment for the upper forward end of the heel.

4. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting a shoe, means for cutting from the margin of the heel portion of the shoe a horseshoe-shaped tongue, and means for cutting off said tongue.

5. A machine for operating upon the sole of a shoe prior to the attaching operation, having, in combination, means for supporting a shoe, means for cutting from the margin of the heel portion of the sole a horseshoe-shaped tongue, means for cutting off said tongue, and means for varying the length of said tongue.

6. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting a shoe, means for splitting the margin of the heel portion of the sole on a bevel, and means for cutting off the tongue thus produced.

7. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting the shoe, means for cutting along the margin of the heel portion of said sole at an angle to the face thereof from the extremity of the heel portion a distance corresponding to the length of the heel which is to be attached whereby a horseshoe-shaped tongue is formed, and means for cutting off said tongue.

8. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the shoe, means for distorting the heel portion of the sole by depressing the middle thereof with respect to the margin, and means for removing from said margin a horseshoe-shaped piece of stock.

9. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the shoe, means for distorting the heel portion of the sole by depressing the middle thereof with respect to the margin, and means for removing stock from the heel portion of the sole and thereby forming a convexity to fit the concavity of the heel which is to be attached.

10. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a jack for holding the shoe, means for supporting the projecting heel portion of the sole, means for depressing the middle part of said heel portion, and means for removing from the sole so held a horseshoe-shaped piece of stock substantially triangular in cross-section.

11. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a jack for holding the shoe, means for supporting the projecting heel portion of the sole, means for depressing the middle part of said heel portion, means for removing from the sole so held a horseshoe-shaped piece of stock substantially triangular in cross-section, and means for varying the length of said piece.

12. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting the projecting heel portion of the sole, means for depressing the middle part of said heel portion, a cutting tool, means for causing said tool to cut along the edge of the heel portion of a sole so depressed and supported, a second cutting tool, and means for causing said second tool to cut into the edge of the sole whereby the heel portion of the sole is given a convexity to fit the concavity of the heel which is to be attached.

13. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting heel portion of the sole, a presser arranged to act upon the middle portion of the heel of the sole, a trimming knife arranged to move with the presser during the trimming operation, means for moving said presser and knife along said support to form a tongue on said sole, and means for cutting off said tongue.

14. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting heel portion of the sole, a spring pressed presser arranged to act upon the middle portion of the heel of the sole, a trimming knife arranged to move with the presser during the trimming operation, means for moving said presser and knife along said

support to form a tongue on said sole, and means for cutting off said tongue.

15. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting heel portion of the sole, a presser arranged to act upon the middle portion of the heel of the sole, a trimming knife arranged to be held during the trimming operation in fixed relation to said presser, means for producing relative movement between said support and said presser and trimming knife to form a tongue on said sole, and means for cutting off said tongue.

16. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting heel portion of the sole, a spring pressed presser arranged to act upon the middle portion of the heel of the sole, a trimming knife arranged to be held during the trimming operation in fixed relation to said presser, means for producing relative movement between said support and said presser and trimming knife to form a tongue on said sole, and means for cutting off said tongue.

17. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting heel portion of the sole, a presser adapted to traverse the middle part of the heel of the sole, means for producing relative movement between said presser and support in a direction to bring the presser into contact with the sole, means for producing relative movement between said parts in another direction to cause the sole to be traversed by the presser, a trimming knife arranged to act in the rear of and close to said presser, and a cutting-off knife for removing the tongue produced by the trimming knife.

18. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for a shoe, a trimming knife adapted to form a tongue on the heel portion of the sole, a cutting-off knife adapted to sever the tongue, means for varying the location of the cut of the cutting-off knife with respect to the end of the cut of the trimming knife, and means for operating said knives.

19. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for a shoe, a trimming knife adapted to form a tongue on said heel portion, a cutting-off knife adapted to sever the tongue, means for varying the distance of the cut of the cutting-off knife from the end of the sole, and means for operating said knives.

20. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a trimming knife arranged to cut along the edge of the projecting margin of the heel portion of the sole, and a cutting-off knife arranged to cut into the edge of the sole at the end of the cut made by the trimming knife whereby the paths of the knives intersect.

21. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a trimming knife arranged to cut along the edge of the projecting margin of the heel portion of the sole, a cutting-off knife arranged to cut into the edge of the sole at the end of the cut made by the trimming knife whereby the paths of the knives intersect, and means for varying with respect to the sole the location of the line of intersection of said paths.

22. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of jaws arranged to enter the rand crease of the shoe and to support the projecting margin of the heel portion of the sole, and means for cutting the margin of the heel portion of the sole so supported on a bevel to provide a convex heel-seat to receive the concavity of the heel which is to be attached.

23. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of jaws arranged to enter the rand crease of the shoe and to support the projecting margin of the heel portion of the sole, and means for removing stock from the heel portion of the sole so supported in such manner as to form a convexity to receive the concavity in the heel which is to be attached.

24. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of jaws arranged to enter the rand crease of the shoe and to support the projecting margin of the heel portion of the sole, means for cutting from the heel portion of the sole so supported a horseshoe-shaped tongue, and means for cutting off said tongue.

25. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of jaws arranged to enter the rand crease of the shoe and to support the projecting margin of the heel portion of the sole, a rest located beneath said jaws and against which the heel portion of the upper of the shoe is arranged to be held, and means for removing stock from the heel portion of a shoe so supported and held in such manner as to form a convexity to receive the concavity of the heel which is to be attached.

26. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of jaws arranged to enter the rand crease of the shoe and to support the projecting margin of the

heel portion of the sole, a rest located beneath said jaws and against which the heel portion of the upper of the shoe is arranged to be held, means for removing stock from the heel portion of a shoe so supported and held in such manner as to form a convexity to receive the concavity in the heel to be attached, and means whereby said rest may be adjusted.

27. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting the projecting margin of the heel portion of said sole, a rest located beneath said supporting means, means for holding the rear of the shoe against said rest, means for cutting along the margin of the heel portion of said sole at an angle to the face thereof from the extremity of the heel portion a distance corresponding to the length of the heel which is to be attached whereby a horseshoe-shaped tongue is formed, and means for cutting off said tongue.

28. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of separable jaws adapted to enter the rand crease of the shoe and to support the projecting margin of the heel portion of the sole, means for distorting the heel portion of the sole by depressing the middle thereof with respect to the plane of said jaws, a trimming knife, means for moving said knife over said jaws to trim the margin of the sole thus distorted, a cutting-off knife, and means for causing said knife to intersect the path of the trimming knife.

29. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of separable jaws arranged to enter the rand crease of the shoe and to support the projecting margin of the heel portion of the sole, means for opening and closing said jaws, and means for removing stock from the heel portion of the sole so supported in such manner as to form a convexity to receive the concavity in the heel which is to be attached.

30. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a pair of separable jaws arranged to enter the rand crease of the shoe to support the projecting margin of the heel portion of the sole, and means for cutting the margin of the heel portion of the sole so supported, on a bevel to provide a convex heel-seat to receive the concavity of the heel which is to be attached.

31. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for a shoe adapted to engage the projecting margin of the heel portion of the sole, a jack for holding the shoe from movement with respect to said support, and means for producing a beveled heel seat on the heel portion of the sole which is offset inwardly at its junction with the shank.

32. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting said shoe, means for cutting along the margin of the heel portion of said sole at an angle to the face thereof from the extremity of the heel portion a distance corresponding to the length of the heel which is to be attached whereby a horseshoe-shaped tongue is formed, means independent of said support for holding the shoe against the force of said cut, and means for cutting off said tongue.

33. A machine for operating on the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting margin of the heel portion of the sole of the shoe, a jack for holding the shoe from movement with respect to said support, a trimming knife and a presser adapted to coöperate to form a tongue on the heel portion of the sole so supported and held, and a cutting-off knife adapted to sever the tongue.

34. A machine for operating on the sole of a shoe prior to the attaching of the heel, having, in combination, means for supporting a shoe, means for removing stock from the heel portion of the sole and thereby forming a convexity to fit the concavity of the heel which is to be attached, an adjustable member the position of which determines the length of said convexity, and a pointer and scale adjusted by adjustment of said member.

35. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting margin of the heel portion of the sole, a presser located above said support, means for raising said support to bring the operative face of the presser into the plane of the sole, means for producing relative movement between said presser and support to cause the sole to be traversed and distorted by said presser, a knife movable with said presser along the sole to trim the margin thereof, and a cutting-off knife arranged to sever the tongue produced by the trimming knife.

36. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting margin of the heel portion of the sole, a presser, a trimming knife and a cutting-off knife movable together over the sole, said cutting-off knife being held inoperative above said sole during such movement, and means for causing said cutting-off knife to enter the sole at an angle to the cut of the trimming knife.

37. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting margin of the heel portion of the sole, a presser for engaging the middle part of said heel portion to distort it, means for causing relative movement between said presser and support to bring said presser into operative relation to said sole, a member by which said presser is carried, a cutting-off knife also carried by said member, a trimming knife connected with said member and arranged to act in the rear of said presser, means for producing relative movement between said support and member along said sole to cause the trimming knife and presser to operate, means for predetermining and varying the point at which such movement shall cease, and means for operating the cutting-off knife.

38. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting margin of the heel portion of the sole, a vertically movable slide by which said support is carried, a second slide movable horizontally over the shoe, a trimming knife, a presser and a cutting-off knife movable with said second slide, means for advancing said slide to trim the margin of the heel portion of the sole and for retracting it to bring the cutting-off knife over the cut made by the trimming knife, a stop for limiting said retracting movement, and means for operating said cutting-off knife and for moving said stop to inoperative position whereby said second slide may be completely retracted to permit withdrawal of the shoe.

39. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting margin of the heel portion of the sole, a vertically movable slide by which said support is carried, a trimming knife horizontally movable on said slide, a second slide horizontally movable and mounted above said first-named slide, a presser roll and a cutting-off knife carried by said second slide, means for connecting said second slide with said trimming knife, means for raising said first named slide to bring the sole of the shoe into contact with the presser, means for moving said second slide to advance the presser and trimming knife along the sole whereby the heel portion of said sole is distorted and trimmed, and means for causing said cutting-off knife to operate.

40. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, means for progressively distorting the heel portion of the sole, means for progressively cutting the distorted portion to form a tongue having a thickened margin, and means for cutting off said tongue.

41. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having, in combination, a support for the projecting heel portion of the sole, a presser arranged to depress the middle part of the said heel portion with respect to the plane of the support, a trimming knife movable with the presser during the trimming operation, means for progressively moving said presser and trimming knife along said heel portion to form a tongue, and means for cutting off said tongue.

42. A machine for operating upon the sole of a shoe prior to the heel attaching operation, having, in combination, a pair of jaws arranged to enter the rand crease and to support the projecting margin of the heel portion of the sole, a yoke having a presser-roll mounted between the arms thereof, said arms being arranged to hold the projecting margin against said jaws and said presser-roll being arranged to force the middle of the heel portion of the sole between said jaws, a trimming knife held from movement with respect to said presser-roll and yoke during the cutting operation, means for producing relative movement between said jaws and said knife and yoke to cause a tongue to be formed on said sole, and a cutting-off knife for severing said tongue.

43. A machine for operating upon the attached sole of a shoe prior to the attachment of the heel, having, in combination, means for supporting the shoe, and means for removing stock in a horseshoe-shaped area from the margin of the tread face of the heel portion in such manner as to form a convex seat to receive the concavity of the heel which is to be attached.

44. A machine for operating upon the sole of a shoe subsequent to its incorporation in the shoe but prior to the attaching of the heel, having, in combination, means for engaging the rand crease, and means for beveling the margin of the heel portion of the sole to provide a raised seat to receive the cavity in the top of the heel which is to be attached.

45. A machine for forming upon the heel portion of a sole a seat to receive the upper portion of the heel which is to be attached, having, in combination, two cutters, means for guiding one cutter to make a cut along the margin of the heel portion of the sole, means for guiding the other cutter to make a cut at an angle to that of said first-named cutter, and means for operating said cutters.

46. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having, in combination, a sup-

port for the shoe, a cutter, and means for causing the cutter to bevel the margin of the heel end of the sole by a cut which extends substantially from the line of junction of the upper with the sole to a line located a sufficient distance inside the line of said junction to provide a seat to receive the cavity formed in the top of the heel which is to be attached.

47. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having, in combination, a rest against which the shoe is held, a cutter, and means for causing the cutter to bevel the margin of the heel end of the sole by a cut which extends substantially from the line of junction of the upper with the sole to a line located a sufficient distance inside the line of said junction to provide a seat to receive the cavity formed in the top of the heel which is to be attached.

48. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having, in combination, a cutter, means for operating said cutter to make around the margin of the heel end of the sole a cut which extends from substantially the line of junction of the upper with the sole to a line sufficiently inside said line of junction to provide a seat to receive the cavity in the top of the heel which is to be attached, and means located adjacent said cutter for guarding said upper from injury.

49. A machine for forming upon the heel portion of a sole a seat to receive the upper portion of the heel which is to be attached, having, in combination, means for forming on the heel portion of the sole a raised seat to receive the cavity in the upper face of the heel, and means for producing a shoulder against which the upper forward end of the heel may abut.

50. A machine for forming upon the heel portion of a sole a seat to receive the upper portion of the heel which is to be attached, having, in combination, mechanism for forming on the heel portion of the sole a raised seat to receive the cavity in the upper face of the heel and for producing a shoulder against which the upper forward end of the heel may abut, and means for operating said mechanism.

51. A machine for operating upon the attached sole of a shoe prior to the attachment of the heel, having in combination, a cutter adapted to bevel the edge and tread face of the heel end of a sole by a cut which extends substantially from the line of junction of the upper with the sole to a distance sufficiently inside said line to provide a seat to receive the cavity formed in the top of the heel which is to be attached, and means for operating said cutter.

52. A machine for forming upon the rear end of a sole a seat to receive the upper portion of the heel which is to be attached, having in combination, means for cutting a portion of the margin of the rear end of the sole on an incline, means for cutting in a direction at an angle to the direction of the first cut, and means for operating said cutting means.

53. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, means for supporting the margin at the rear portion of the sole, and means for cutting the margin so supported to provide a raised seat to receive a cavity in the heel which is to be attached.

54. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, means for supporting the margin at the rear portion of the sole, and means for removing stock from the margin so supported in such manner as to form a convexity to receive the concavity in the heel which is to be attached.

55. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, a cutter adapted to bevel the lateral edges of the rear end of the sole, means for supporting the shoe and positioning it laterally with respect to the cutter; and adjustable means for determining the relative longitudinal position of the shoe with respect to the cutter.

56. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, means engaging the rear of the sole on the side toward the upper of the shoe to support it, a rest against which the heel portion of the upper of the shoe is arranged to be held, means for removing stock from the rear end of the sole so supported and held, and means whereby said rest may be adjusted to vary the location of the stock which is removed.

57. A machine for operating upon the sole of a shoe prior to the attaching of the heel, having in combination, a pair of separable jaws arranged to support the margin at the rear end of the sole, means for opening and closing said jaws, and means for removing stock from the marginal portion so supported in such manner as to form a seat to receive a cavity in the heel which is to be attached.

58. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, means for scarfing a portion of the rear of said sole to provide a seat for the heel, and means for forming a shoulder adjacent said scarfed portion to abut against the upper forward end of the heel.

59. A machine for operating upon the at-

tached sole of a shoe prior to the attaching of the heel, having in combination, means for scarfing a portion of the rear of said sole to provide a seat for the heel, and means for forming a curved shoulder adjacent said scarfed portion to abut against the upper forward end of the heel.

60. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, supporting means for engaging the rear portion of the sole on the side toward the upper of the shoe, and means for forming on said rear portion a seat comprising a surface adapted to abut against the upper face of the heel, the shape of said surface corresponding to the shape of the upper portion of the heel which is to be attached.

61. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, means for supporting the rear portion of the sole by engagement with the side toward the upper of the shoe, and means for removing stock from said portion to form a seat comprising a surface adapted to abut against the upper face of the heel to fit the upper portion of the heel which is to be attached.

62. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, means for engaging the rear portion of the sole on the side toward the upper of the shoe to support it, a cutter, means for reciprocating the cutter to cause it to cut the rear portion of the sole from the other side, a rest against which the heel end of the shoe may be held, and means whereby the position of the rest may be varied to vary the location of the cut on the sole.

63. A machine for operating upon the attached sole of a shoe prior to the attaching of the heel, having in combination, a supporting member extending into the space between the rear portion of the sole and the shoe to support the rear portion, a knife, means for reciprocating the knife in a path substantially perpendicular to the plane of the sole, a rest against which the rear end of the shoe may be held, and means whereby the rest may be adjusted to vary the location of the cut.

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

SAMUEL J. WENTWORTH.

Witnesses:
OLIVER B. KAISER,
EMMA SPENER.