This invention relates to the manufacture of shoes and is illustrated as embodied in a heel-seat fitting machine.

In preparing shoes for the reception of wood heels it is customary to trim the margin of the heel-seat portion of the sole of the shoe, thereby to provide a reduced heel-seat portion shaped for reception within the concave attaching face of the heel of the shoe, and to form at opposite sides of the reduced heel-seat portion a pair of laterally extending shoulders against which the breast of the heel abuts. The reduced heel-seat portion of the sole should be shaped to engage substantially the entire attaching face of the heel in order to provide a solid foundation of considerable area for supporting the heel, and should be reduced sufficiently to permit the rim of the attaching face of the heel snugly to engage the counter portion of the shoe upper. Moreover, the laterally extending shoulders should be accurately positioned lengthwise of the sole in order to engage the breast of the heel of the finished shoe.

It is an object of this invention to provide an improved machine by the use of which the heel-seat portions of the soles of shoes of different types of construction can be effectively and rapidly fitted for the reception of either Cuban or Louis heels. Another object of this invention is to provide an improved machine of the general type disclosed in United States Letters Patent No. 1,307,284, granted June 17, 1919 on an application filed in the name of Samuel J. Wentworth.

One type of machine which has been used successfully for fitting the heel-seats of shoes, the soles of which are stitched or stapled to the shoe uppers, for the reception of wood heels, is disclosed in United States Letters Patent No. 1,856,057, granted April 26, 1932 on an application filed in the names of Bagshaw and Wardle. In the machine disclosed in said Patent No. 1,856,057 the heel-seat portion of the sole of a shoe, after being positioned upon a matrix or crease plate which is constructed and arranged to engage the radial crease of the shoe and is provided with a U-shaped opening, has its margin pressed against the plate by a presser member while a bulger forces the central part of the heel-seat portion of the sole through the opening and beyond a face of the plate. After the heel-seat portion of the sole has been properly distorted and clamped, a reciprocating cutter, commonly referred to as a heel-seat reducing or tongue-forming cutter and having its cutting edge in engagement with the above-mentioned face of the matrix plate, is moved forwardly to trim the margin of the heel-seat portion of the sole thereby reducing the heel-seat portion and providing a tongue shaped for reception within the attaching face of the heel which is to be attached to the shoe. After the heel-seat portion of the sole has been trimmed, a pair of cutters are operated to form heel-breast receiving shoulders upon the sole and to remove from the sole the U-shaped chip trimmed from the heel-seat portion of the sole by the back cutter.

When the heel-seat portions of soles of compo shoes are distorted in the manner above described, the cement bond which secures the sole to the shoe upper is likely to be split forwardly of the breast line with the result that the rear end of the shank portion of the finished shoe is not secured properly to the shoe upper. This condition may also be caused by using a matrix plate, the forward edge of which is of such thickness as to cause the sole at its heel breast line to be pulled too far away from the shoe upper or it may be caused by using a matrix plate which extends forwardly of the heel breast line of the sole.

The illustrated heel-seat fitting machine which constitutes a preferred embodiment of my invention, is of the general type above referred to and is constructed and arranged effectively and quickly to prepare the heel-seats of shoes for the reception of heels whether the soles of the shoes are stitched, stapled or adhesively secured to their respective shoe uppers. In order to insure that the sole will not be split forwardly of the breast line when the heel-seat of a compo shoe is fitted for the reception of a heel, the illustrated machine is provided with matrix or crease plates having their forward portions of suitable shape to enter the rand crease of the shoe without substantially distorting the sole. Furthermore, the back gage of the machine is initially positioned at a predetermined distance from the forward edge of the matrix plate so that when the shoe engages the back gage, the plate will extend to, but not forwardly of, the heel-breast line of the shoe. To prevent the distortion of the heel-seat portion of the sole from breaking the sole-attaching bond forwardly of the breast line, the illustrated machine is provided with mechanism constructed and arranged to operate knives for forming the heel-breast receiving shoulders upon the sole supported by the matrix plate before the bulger is operated to distort the heel-seat portion of the sole preparatory to reducing the heel-seat portion.

The heel-seat reducing cutter in moving for-
wardly of the sole forces the heel portion of the shoe away from the matrix plate and thereby causes the shoe to pivot progressively about the heel-breast line of the sole of the shoe. When the heel-breast receiving shoulders are formed prior to reducing the heel-seat portion of the sole, it will be noted that the margin of the heel-seat portion which holds the shoe against forward displacement under pressure of the heel-seat reducing cutter is removed from the sole by the cutter during the heel-seat reducing operation. Accordingly, when the shoulder-forming cutters of a machine of the type above described are withdrawn from the sole immediately after the heel-breast receiving shoulders have been formed, it will be noted that as the heel-seat reducing cutter arrives at a position adjacent to the heel-breast line of the sole, the forward pressure exerted against the sole by the cutter frequently causes the U-shaped chip to be torn from the sole adjacent to the previously formed heel-breast receiving shoulders, thereby forming ragged or uneven lumps at the forward lateral portions of the reduced heel-seat. The operator usually grips the heel-seat portion of the shoe as it is being trimmed and does not resist the above described pivotal movement of the shoe, since such resistance would cause the heel portion of the shoe to be forced away from the trimmed margin of the heel-seat portion of the sole and would therefore increase the tendency of the U-shaped chip to be pulled from the sole. When the U-shaped chip is torn from the sole, as above described, the operator is required to remove from the sole the ragged lumps of leather which interfere with the accurate positioning of the heel on the shoe.

With the foregoing in view the illustrated machine, in accordance with a feature of this invention, is provided with a shoulder-forming cutter for making incisions in a sole to form heel-breast receiving shoulders upon the sole, a heel-seat reducing cutter movable forwardly of the sole, and a mechanism for operating the shoulder-forming cutter in timed relation with the heel-seat reducing cutter and for causing the shoulder-forming cutter to remain in the incision as the heel-seat reducing cutter trims the sole, thereby to brace the sole against the operating pressure of the heel-seat reducing cutter.

It is desirable that substantially the entire margin of the heel-seat portion of the sole be securely clamped to the matrix plate while the central part of the heel-seat portion is being forced through the U-shaped opening and while the heel-seat reducing or tongue-forming cutter is reducing the heel-seat portion of the sole, in order that the sole will be tensioned around the bulger and to prevent the tongue-forming cutter from pulling from the margin of the heel-seat portion through the U-shaped opening. The margin of the heel-seat portion of the sole is seldom of uniform thickness and in order to clamp substantially the entire margin of the heel-seat portion of the sole against the matrix plate and in accordance with a further feature of the invention, an illustrated presser member, which clamps the margin of the heel-seat portion of the sole against the matrix plate preparatory to distorting and reducing the heel-seat portion of the sole, is provided with a plurality of parts, at least one of which is movable under pressure relatively to the other parts. Each of these illustrated presser members is mounted to tilt as a unit as it presses the sole against the matrix plate. The presser members may be constructed of a plurality of sole-engaging parts which are pivotally movable relatively to each other, as illustrated in one embodiment of the invention, or may be provided with a U-shaped sole-engaging member made of rubber or like substance, as illustrated in another embodiment of the invention.

When a shoe is being inserted lengthwise in a heel-seat fitting machine provided with a sole-supporting plate, it sometimes happens that as the operator moves the shoe rearwardly of the machine toward the back stop, a bulger which has not been driven into the heel-seat portion of the shoe engages the plate. When this occurs the operator, thinking that the rear portion of the shoe upper has engaged the back stop, may operate the machine with the result that the reduced heel-seat portion is not properly positioned upon the sole. In order to enable the operator to tell at a glance when the shoe is positioned properly lengthwise, the illustrated machine, in accordance with another feature of the invention, is provided with a slide mounted for movement under pressure of the shoe, a stop constructed and arranged for the purpose of moving the slide to limit the movement of the same, means to adjust the stop, and a visible indicator which assumes a predetermined recognizable position when the member is in contact with the stop.

Soles of shoes having their heel-seats fitted for the receptivity of heels are frequently thick as well as dry and in order to force the central parts of the heel-seat portions of such soles through the U-shaped opening as much as 3,000 pounds of pressure is frequently required. In order to increase the production of the machine and to relieve the operator of the burden of distorting the sole, the illustrated machine, in accordance with another feature of the invention, is provided with a stop for limiting the movement of the bulger toward the matrix plate and with a power-operated mechanism comprising a protective member and an abutment which engages the stop during each cycle of operation of the machine, to ensure that the bulger will force the central parts of the heel-seat portions of dry soles of different thicknesses through the U-shaped opening of the matrix.

As already stated, the margin of the heel-seat portion of the positioned shoe is clamped against the plate before the bulger distorts the sole in order that the heel-seat portion of the sole will be tensioned by the bulger as it forces the central part of the heel-seat portion of the sole through the U-shaped opening. In order to enable the operator to control the movement of the presser member for clamping the heel-seat portion of the sole as he positions the same on the matrix plate, the illustrated machine is provided with manually operated means for forcing the presser member against the sole positioned upon the plate with an initial pressure, and with power-operated mechanism which applies a secondary pressure to the presser member and operates the bulger for forcing the central part of the heel-seat portion of the sole through the U-shaped opening. The shoulder-forming cutter of the illustrated machine is shown as comprising a pair of spaced knives which move past the forward breast edge of the plate in paths disposed at substantially right angles to the plane of a sole positioned upon the matrix plate. When operating upon well work there is a tendency for the above-mentioned knives, especially when such knives become dull,
to bend the end portions of the welt downward instead of severing the same, together with the sole, to form heel-breast receiving shoulders. According to the present invention the illustrated machine may be equipped with shoulder-forming knives which are mounted for movement in equal and opposite directions along the forward edges of the matrix plate. The illustrated transversely moving knives are power operated and form heel-breast receiving shoulders upon the sole before the heel-seat portion of the sole is substantially distorted by the bulger and preferably come to rest temporarily, after forming the heel-breast receiving shoulders, in order to support the sole against displacement by the heel-seat reducing cutter and to serve as anvils against which the heel-seat reducing cutter operates.

In a machine of the type herein illustrated the U-shaped chip, which is removed from the heel-seat portion of the sole, remains upon the matrix at the termination of the heel-seat fitting operation. In order to remove the chip from the matrix plate at the end of each operation, the illustrated machine is provided with a pivotally mounted chip ejector which is positively operated by mechanism carried by the sole clamping and distorting plunger.

In fitting the heel-seats of soles for the reception of Louis heels, it is sometimes the practice to provide at opposite sides of the base of the reduced heel seat a pair of laterally extending shoulders which taper rearwardly of the sole and are inclined at a slight angle to the plane of the sole. The illustrated machine can be quickly equipped to provide heel-breast receiving shoulders of the type above described by inserting a short matrix plate in the machine and by removing the carrier to which the shoulder-forming knives are attached from the machine and substituting therefor a member having a sole-engaging surface inclined to the path of movement of the heel-seat reducing cutter and constructed and arranged to press the lateral portions of the sole which are positioned forwardly of the matrix plate against the path of movement of the cutter. The sole-depressing member also holds down the lateral portions of the sole, which are positioned immediately in advance of the breast line, against the shoe upper during the sole-distorting operation and thus prevents the distortion of the heel-seat portion of the sole from splitting the sole-attaching bond forwardly of the breast line when the shoe is operating on compo work. The angle which the shoulders form with the plane of the sole depends upon the inclination of the sole-engaging face of the depressing member with respect to the path of travel of the heel-seat reducing cutter and, accordingly, the member is mounted for angular adjustment relatively to such path.

The invention in its method aspect comprises making incisions in a sole attached to a shoe upper to form heel-breast receiving shoulders upon the sole, and reducing the margin of the heel-seat portion of the sole by a trimming cut which progresses forwardly of the sole to the incisions while utilizing such incisions to prevent forward movement of the sole during the heel-seat reducing operation.

With the above and other objects and features in view, the invention will now be described with reference to the accompanying drawings and pointed out in the claims.

Fig. 1 is a perspective view of the illustrated machine.

Fig. 2 is a side elevational view of the operating head of the machine illustrated in Fig. 1;

Fig. 3 is an enlarged side view showing portions of the operating mechanism of the machine when the treadle, which is operated to clamp the work against the matrix plate and actuates the trimming mechanism, is in a lowered position;

Fig. 4 is a vertical sectional view illustrating the relative positions of the sole of a shoe and parts of the operating head of the machine after the sole has been initially clamped against the matrix plate;

Fig. 5 is a sectional view corresponding to Fig. 4 but showing the relative positions of the sole and the parts of the operating head of the machine after the heel-breast receiving shoulders have been formed and after the central part of the heel-seat portion of the sole has been forced through the matrix plate preparatory to reducing the heel-seat portion of the sole;

Fig. 6 is a sectional view similar to that shown in Fig. 5 and illustrating the relative positions of the sole of the shoe being operated upon and the parts of the operating head of the machine as the heel-seat reducing cutter arrives at the forward end of its stroke to complete the heel-seat fitting operation;

Fig. 7 is a transverse sectional view of the operating head taken along line VII—VII of Fig. 5;

Fig. 8 shows a sectional view taken along line VIII—VIII of Fig. 2;

Fig. 9 is a perspective view showing mechanism for positioning the sole of the shoe upon the matrix plate, part of the mechanism being broken away in order better to illustrate the construction thereof;

Fig. 10 is a perspective view of the shoulder-forming cutter and a cutter carrier which is partly broken away to show the interior construction of the same;

Fig. 11 is a sectional view taken along line XI—XI of Fig. 10;

Fig. 12 is a sectional view taken along line XII—XII of Fig. 8;

Fig. 13 is a sectional view taken along line XIII—XIII of Fig. 8;

Fig. 14 is a perspective view of the matrix plate;

Fig. 15 shows in perspective the heel-seat reducing cutter and a cutter carrier for securing the cutter to an operating member;

Fig. 16 is a perspective view of one form of presser member;

Fig. 17 is a perspective view of the form of presser member shown as incorporated in the illustrated machine;

Fig. 18 is a perspective view of a modified form of presser member which is similar to that shown in Fig. 17;

Fig. 19 is a perspective view of the rear end of a shoe the heel-seat portion of the sole of which has been fitted for the reception of a Cuban heel;

Fig. 20 is a perspective view of the rear end of a shoe the heel-seat portion of the sole of which has been fitted for the reception of a Louis heel;

Fig. 21 shows in perspective the U-shaped chip that has been removed from the heel-seat portion of the sole illustrated in Fig. 19;

Fig. 22 is a sectional view taken along line XXII—XXII of Fig. 2;

Fig. 23 is a front elevational view of the head of the illustrated machine equipped with knives which move transversely of the sole positioned upon the matrix plate to form heel-breast re-
ceiving shoulders upon the sole, and a carrier for supporting and operating the knives; Fig. 24 is a side elevational view of the shoulder-forming knives and the carrier illustrated in Fig. 5.

Fig. 25 is a sectional view taken along line XXX-XXX of Fig. 24.

Fig. 26 is a side elevational view partly in section of the operating head of the illustrated machine equipped with a presser plate for forcing the lateral margins of the sole positioned forwardly of the matrix plate across the line of travel of the heel-seal reducing cutter to form a reduced heel-seal portion of the sole and heel-breast receiving shoulders such as illustrated in Fig. 28.

Fig. 27 is a perspective view of portions of the machine illustrated in Fig. 26, part of the machine being broken away to show the shape of the heel-seal portion of the sole after it has been flexed preparatory to trimming the sole; and Fig. 28 is a perspective view of the rear end of a shoe, the heel-seal portion of the sole of which has been operated upon in the machine equipped as illustrated in Figs. 26 and 27.

The illustrated machine is described with reference to the performance of the heel-seal fitting operation on soles 30 (Fig. 19) attached to shoe upper 36, which operation consists in forming upon the sole, heel-breast receiving shoulders 34 against which the breast of a Cuban heel 33 abuts, and in trimming the heel-seal portion of the sole to provide a tongue or reduced heel-seal portion 32 shaped for reception within the concave attaching or cup face of the heel.

The illustrated machine comprises a matrix or crease plate 33 (Fig. 1) provided with a U-shaped opening 38 and constructed and arranged to support the heel-seal portion of the sole 30, a U-shaped presser member 40 mounted for vertical movement to clamp the margins of the heel-seal portion of the sole against the plate 33, a pair of cutters or knives 42 which move past forward or breast edges 44 of the matrix plate 33 to form the heel-breast receiving shoulders 34 upon the sole, a bulge 45 (Figs. 4, 6 and 6) mounted for vertical movement to force the central part of the heel-seal portion of the sole through the opening 38, and a cutter or knife 48 mounted for horizontal movement along the bottom face of the matrix plate 33 to trim the margin of the heel-seal portion of the sole to form the tongue or reduced heel-seal portion 32.

It will be noted that the illustrated machine is equipped to fit the heel-seal portions of soles for the reception of Cuban heels 35 (Fig. 19) as distinguished from Louis heels 37 (Fig. 20). The heel-breast receiving shoulders 34 are of convex form in order to receive the concave breast of the Cuban heel 33 and heel-breast receiving shoulders 50 (Fig. 20), against which the forward edge of the projecting lip of the Louis heel 37 abuts, usually lie in a single plane extending at right angles to the lengthwise median plane of the sole. Although the machine is illustrated with reference to Cuban work, it may be readily equipped for operating upon Louis work as will later be explained.

As already stated, when heel-seal fitting machines of the type which substantially distort the heel-seal portions of soles are used, it has been found that the sole in the vicinity of its breast line 52 (Figs. 19 and 20) is often distorted to such an extent that stitches which secure the sole to the shoe upper and are positioned forwardly of the breast line 52 are loosened. Such a condition is objectionable, and in fitting the heel-seals of compo shoes, the soles of which are attached by cement to the shoe uppers, the substantial distortion of the heel-seal portion of the sole is not permissible since the distortion breaks the cement bond by which the sole is attached to the shoe upper, forwardly of the breast line 52 of the sole.

The shank portions 54 (Figs. 19 and 20) of soles attached to shoes are sometimes laterally curved and it will therefore be noted that when the sole is corrected by the illustrated machine and illustrated, there will be a slight distortion of the lateral margins of the sole forwardly of the breast line 52 as the plate 36 engages within the rand crease of the sole. Such distortion, however, is not sufficient to break the cement bond forwardly of the breast line.

With the above and other considerations in view, the illustrated machine is constructed and arranged to form the heel-breast receiving shoulders 34 before the heel-seal portion of the sole is substantially distorted and therefore prior to trimming the heel-seal portion of the sole to form the tongue or reduced heel-seal portion 32. The upper and lower faces of the matrix plate 33 (Fig. 14) converge as they extend forwardly of the plate and terminate in the feather edge of the breast line and from such an arrangement of the machine and the illustrated machine will be seen that the position of which is controlled by a heel gage 80 (Figs. 1, 2 and 8). In order to centralize the rear portion of the

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The illustrated machine is provided with a slide 82 (Figs. 4, 5, 7 and 9) mounted upon the stop plate 78 and having a bifurcated portion 84 normally urged into a forward position with respect to the stop plate 78 by springs 86 (Fig. 9), the arrangement being such that as the shoe is moved rearwardly of the machine the rear counter portion of the shoe engages the bifurcated portion 84 and is moved rearwardly against the pressure of springs 86 until the rear end of the shoe engages the back gage 74 which, together with the bifurcated portion 84, is moved rearwardly against the spring 88 until stopped by the adjustable stop plate 78.

The heel gage 80 (Figs. 1, 2 and 8) comprises a table 83 for engaging the attaching face of the heel, a block 80 shaped for engagement with the breast of the heel and a movable abutment 92 provided with an offset arm 94 which is attached to the adjustable stop plate 78. In order to adjust the stop plate 78 in accordance with the length of the heel to be attached to the shoe the heel is placed, attachment face downwardly, on the table 83 with the breast of the heel engaging the block 80, and the abutment 92 is then moved into engagement with the rear end of the rim of the attaching face of the heel. Such a movement is effected by swinging a pivotally mounted hand crank 102, the hand crank 102 is journaled in bearing 98 and is secured to a cam 100, relatively to an index or latch plate 103. The cam 100 is provided with a groove 102 (Fig. 4) shaped and arranged to receive a cam roll 104 mounted upon a depending pin 106 secured to the adjustable stop plate 78 which, as above stated, is connected to the abutment 92 of the heel gage.

Although the machine is described as comprising a gage 80 which actually measures the heel, and mechanism which connects the gage and the stop plate 78 to position the stop plate in accordance with the length of the heel being measured, it will be understood that the stop plate 78 may be positioned by using a size scale 101 formed upon the index or latch plate 103. It has been found that heels which are supposed to be of the same size vary 5% or more and this reason it is preferable to gage from the heel.

The illustrated heel gage 80 is adjusted for the reception of Cuban heels, the rear face 108 of the block 98 being curved and located in a predetermined position upon the table 83. When it is desired to measure Louis heels the block 98 is turned 180° about a pin 109 (Fig. 8) so that a straight face 110 engages the lip of the projecting part of the breast of the Louis heel which is to be measured. In order accurately to position the block for gaging Louis and Cuban heels, the block is provided at its under side with a pair of recesses 112 either of which may be swung into registry with a spring-pressed plunger 114 (Fig. 2) carried by the table 86. The abutment 92 can be adjusted relatively to the offset arm 94 by a screw and slot connection 116 (Fig. 8) in order initially to set the adjustable stop plate 78 and the abutment 92 in predetermined relative positions.

As above stated, in fitting heel-seats for the reception of Cuban heels, it frequently happens that when the operator moves the shoe rearwardly to cause the matrix plate 36 to enter between the sole and the overlapped margin of the counter portion of the shoe, an upstanding nail engages the matrix plate and prevents further rearward movement of the shoe. When this occurs the operator, thinking that the back gage 74 has been pushed against the stop plate 78, operates the machine with the result that the reduced heel-seat portion of the sole is not properly positioned for the reception of the heel. In order to insure against this condition, an indicator 118 (Fig. 8) is secured to the offset arm 94 which connects the stop plate 78 and the abutment 92 and another indicator 120 is secured to the back gage 74. When the back gage 74 has been moved rearwardly against the stop plate 78 the indicators 118, 120 are in alignment as illustrated in Fig. 8 and it is therefore possible for the operator to tell at a glance when the shoe has been properly positioned lengthwise.

To assist the operator in centralizing the Shank portion of the shoe being operated upon, the illusory presser member is provided with an arm 132 (Figs. 1 and 2) which lies in the vertical central plane 124 (Fig. 8) of the matrix plate 36 and can be swung into different adjusted positions upon a screw 126.

The presser member 40 is operated by a sleeve 130 which is mounted for reception in a bearing portion 132 of the main frame 56 and is bored to receive a rod 134 to the lower end of which the bulger 46 is attached. In order to insure that the sleeve 130 and the rod 134 will not turn about their common axis during the operation of the machine, the bearing portion 132 is provided with a threaded opening 136 (Fig. 7) for receiving a screw 138 provided with a reduced portion which is shaped to fit an elongated slot 140 formed in the sleeve 130 and a smaller portion which engages an elongated recess 142 cut in the side of the rod 134. The lower part of the sleeve 130 is provided with an enlarged housing 144 having a pair of oppositely disposed U-shaped slots 146 constructed and arranged to receive interchangeably one of a plurality of presser members or clamps 40 of various sizes and shapes. The sleeve 130 is supported by an enlarged flange portion 148 of the rod 134 and is normally held in engagement with such portion by a spring 150 encased within a cylindrical housing 152 which is mounted upon the rod 134.

The upper end of the cylindrical housing normally engages a nut 154 which is in threaded relation with the rod 134 and is therefore adjustable along the same to insure that the bulger in its lowered position (Figs. 5 and 7) will extend to but not below the bottom face of the crease plate 36. At the lower end of the rod 134 is a stud portion 156 of reduced diameter shaped to receive interchangeably one of a plurality of bulgers 46, the stud being provided with a forward flat face 158 for preventing rotation of the bulger 46 with respect to the stud portion and having a recess 160 shaped and arranged to receive a spring-pressed plunger 162 carried by the bulger 46. Upon the upper part of the bulger 46 are a pair of shoulders shaped and arranged to abut against shoulders 184 (Fig. 4) of the enlarged portion 148 in order further to insure that the bulger 46 can not turn with respect to the rod 134.

It is desirable to clamp the sole against the beveled face 68 (Fig. 14) of the matrix plate 36 in order that the sole will be tensioned around the bottom of the bulger 46 as the bulger forces the central portion of the heel-seat portion of the sole through the opening 38 and below the lower face of the plate 36. Accordingly, the presser member 40 leads the bulger 46 as the rod 134 is moved downwardly, through mechanism which will be described later, and clamps the sole to 150.
the plate 36 before the bulger 46 becomes effective. As the bulger 46 forces the sole through the opening 38 the spring 150, which is compressed by the downward movement of the mat-
rix plate 36, the plate 46 forces the sole through the opening 38 and during the operation of the
seat portion of the sole is pressed against the crease of the plate 36 as the bulger 46 forces the sole through the opening 38 and denting the presser member 40 into a lowered position relatively to the housing 144 when the presser member has been moved away from the matrix plate 36.

As already explained, it is desirable that sub-
stantially the entire margin of the heel-seat port-
ion of the sole be pressed against the crease of the plate 36 as the bulger 46 forces the sole through the opening 38 and the practice of operating upon soles prior to the
performance of the heel-seat fitting operation is not uniform, the margins of heel-seat portions of the soles sometimes being skived during the shank-reducing and channeling operation as far as their rear ends and sometimes being skived only to the breast line of the sole. Moreover, the shank reducing or channeling cut often runs farther back on one side of the sole than on the other so as to form a sole, the heel-seat portion of which is much thicker at one side than at the other. Although it is desirable to clamp the sole around the entire margin of its heel-seat portion it has been found that if the rear portion of the sole and portions of the lateral margins positioned adjacent to the breast line 52 of the sole are clamped, the sole will be suit-
ably tensioned by the bulger 46 preparatory to re-

ducing the heel-seat portion of the sole. With the foregoing in view, the presser member or clamp 40 (Fig. 17) has been found to be effective in compensating for variations in thickness of the margin of the heel-seat portion of the sole. The clamp or presser member 40 has the general shape of the letter U and comprises a hight portion 166 pivotally mounted upon a pin 168 journ-
ned in projections 170 of a plate 172 comprising leg or side portions 174. The leg portions 174 may be formed integrally with or may be screwed or otherwise secured to the plate 172. A corrugated sole engaging face 176 of the hight portion 166 is normally urged beyond corrugated sole-engaging faces 178 of the leg or side portions 174 by a pair of springs 180. The sole-

generating faces 176, 178 have a general form which is substantially complementary to that of the beveled surface 68 of the matrix plate 36 with which the faces 176, 178 cooperate to clamp the margin of the heel-seat portion of the sole against the plate. The above arrangement insures that the margin of the heel-seat portion of the sole is tightly pressed against the matrix plate 36 in respective of varying thicknesses of the margin of the heel-seat portion.

In order further to insure that the presser member or clamp 40 will apply pressure to the margin of the heel-seat portion of the sole even though such margin varies in thickness, the op-
posing U-shaped slots 146 (Figs. 2 and 7) which receive the plate 172 of the presser member 40 are of a width equal to the thickness of the plate 172 at their forward ends and flake in width rear-
wardly from their forward ends. Such a construc-
tion permits the plate 172 to pivot around its forward edge. The presser member or clamp 40 is inserted in the housing 144 from the rear and may be moved forwardly until an upstanding plane 180 of the plate 172 engages the rear face of the housing 144, the presser member 40 being held against rearward movement with re-

pect to the housing 144 through a spring-pressed plunger 188 carried by the housing and engag-
ing a recess 190 formed in the top surface of the plate 172. The plunger 188 also presses the plate 172 against the lower face of each of the slots 146 and thus engages the presser member 40 into a lowered position relatively to the housing 144 when the presser member has been moved away from the matrix plate 36.

It will be noted that when the sleeve 130 is lowered the right portion 166 of the presser member 40 is in contact with the sole and that as the sleeve 130 continues to move down-
wardly, the plate 172 rocks about its forward edge to force the forward parts of the leg por-
tions 174 into engagement with the margin of the heel-seat portion which is positioned adja-

cent to the breast line 52. The hight portion 166 then swings about the pin 168 to compress the springs 180 and upon continued downward move-
ment of the sleeve 130 the rear parts of the leg portions 174 are swung downwardly about the forward end of the plate 172 under pressure of the forward parts of the leg portions 174, there-
by to cause leg portions which are positioned rearwardly of the forward end of the plate 172 to be pressed against the margin of the heel-
seat portion of the sole.

Other presser member 192, 194 (Figs. 18 and 16, respectively) may be used in place of the presser member 40. The construction and operation of the presser members 192, 194 will be explained in detail after the illustrated ma-
chine has been more fully described.

As above stated, in order that the sole will not be substantially distorted forwardly of the breast line 52 during the heel-seat fitting operation, the illustrated machine is provided with mecha-
nism for operating the shoulder-forming cut-
ers or knives 42 after the presser member 40 has clamped the margin of the heel-seat portion of the sole against the matrix plate 36 but be-

fore the bulger 46 has forced the central part of the heel-seat portion through the opening 38. The illustrated Shank portions 196 (Fig. 10) of the shoulder-forming knives 42 are of cylin-
drical shape and have a radius of curvature cor-
responding substantially to that of the breast edges 44 of the matrix plate 36 past which the knives 42 are moved. As above stated, such an arrangement is suitable for fitting the heel-seat portions of soles for the reception of Os heel.

Heels. It will be understood, however, that in order to fit the heel-seat portions of soles of shoes for the reception of Louis heels the plate 36 may be replaced by a plate the forward edges of which extend at right angles to the vertical central plane 124 of the plate, and shoulder-
forming knives the cutting edges of which lie in a single plane may be substituted for the curved shoulder-forming knives 42 above described.

The shank portions 196 (Figs. 10 and 11) of the knives 42 are provided with recesses and arranged to receive projecting pins 198 se-
cured to blocks 200 which are slidable mounted in a curved guideway 202 of a carrier head 204 and are spaced at opposite sides of and at equal distances from the vertical central plane 124 (Fig. 8) of the matrix plate 36. The blocks 200 are mounted for equal and opposite adjustment relatively to the plane 124 by turning a screw 206 journaled in a clamp plate 208 of the carrier head 204 and including right and left threaded portions 210, 212 in threaded relation with tripod nuts 210, 212, respectively, carried by the blocks 200. Before adjusting the blocks 200 toward and away from the central plane 124 along the
guideway 202 the clamp plate 208, which is shaped to engage the rear face of the shank portions 196 of the knives 42 near pins 198, is released from binding engagement with the knives 42 by turning a screw 212, after which the knife carrier head 204 is provided with a corresponding shaped dove-tailed projection of the carrier head 204. The carrier head 204 may be adjusted along the guideway of the block 214 by loosening the screws 216 upon which washers 221 are mounted in threaded relation with the block 214 and pass through slots 222 formed in an upstanding flange of the carrier head 204. In order to adjust the position and to ensure the lower end in engagement with a face 226 of the carrier head 204.

When it is desired to change to Louis work the carrier head 204, together with the shoulder-forming knives 42 and the block 214, may be readily removed from the machine by removing the screws 216 which connect the block 214 to a projecting arm 228 of the operating slide 218. By providing such an arrangement the operator can quickly replace the knife carrier head 204 after it has been removed from the machine in its former position, without having to adjust the shoulder-forming knives 42 to the carrier head.

The operating slide 218 (Figs. 1 and 2) is mounted for reciprocity along a guideway 230 of a guide 232 which is pivotally mounted at its lower end upon an eccentric pin 234 (Fig. 2) and is provided with a threaded recess 236 (Figs. 2 and 22) which may be moved into and out of an opening 238 formed in the main frame 56. The guide 232 is clamped in adjusted position relatively to the main frame 56 by a screw 237 which passes through one of the openings 238 and is constructed for reciprocation within the threaded recess 236. By providing the above arrangement, the path of reciprocity of the shoulder-forming knives 42 can readily be changed in accordance with the angle to be formed between the heel-breast receiving shoulder 34 and the plane of the sole. A gib 242 of the guide member 232 forms the bearing surface for one side of the operating slide 218.

The eccentric pin 234 is formed integrally with a shaft 240 which is carried by and is rotatably adjustable in the main frame. The axis of the shaft 240 is located a distance equal to the thickness of the top and is centered to pass past the bottom edge 44 of the matrix plate 26. By turning the shaft 240 the operator can control the path of movement of the shoulder-forming knives 42 and thereby position the guide 232 that the knives will move past the bottom edge 44 of the matrix plate 26.

In order to operate the presser member 40 and the bulger 46, a head 244 (Figs. 1 and 2) adjustably secured to the rod 134 is linked to a lever 246 pivotally mounted on the main frame and connected through a link 250 to another link 252 which is pivotally mounted upon a pin 254 carried by the main frame. The link 250 is operated by a rod 254 which is lengthwise adjustable and carries a safety spring 256 constructed to yield before a force sufficient to strain the parts of the bulger-operating mechanism is imparted to the rod 254. Pivotaly connected to the lower end of the rod 254 is an angular plate 258 (Figs. 1 and 3) which is pivotally connected to a shaft 260 of the main frame and is initially operated by a link 262 connected to a treadle 264. The treadle is normally held in a raised position by the use of the treadle 264 the operator is able to control the pressure member 40 during the initial clamping of the sole against the matrix plate 36. In order to force the sole, which has been clamped by the treadle 264, through the U-shaped opening 30 and to effect a secondary clamping passing a secondary engaging the margin of the sole upon the matrix plate 36 preparatory to operating the heel-seat reducing or tongue-forming knife 48, the illustrated machine is provided with power-operated mechanism which is thrown into operation by the use of the 264 as the treadle 264 is lowered a link 266, the lower end of which is pivoted to the treadle, causes a bell-crank lever 268, which is pivotally mounted upon a stud 270 of the plate 235, to rock in a counterclockwise direction and to swing a lever 272 rearwardly until a stop 274 formed at the upper end of the lever 272 is positioned under an arm 276 keyed to the shaft 260. The bell-crank lever 268 operates the arm 273 through a rod 278 which is pivotally connected to the forward end of the bell-crank lever 268 and carries a spring 280 the rear end of which engages an extension 282 of the arm 273. The shoulder 274 of the arm 272 swings rearwardly into position just past a pin 284 secured to the treadle lever 264 is lowered against the pressure of a spring 285 which operates the arm 272 rearwardly. When a cam groove 286 is normally held in a raised position by a spring 287 and releases a one-revolution clutch (not shown) for setting in motion a two-groove cam 288 mounted upon a drive shaft 290. It will be noted that the steps 270 normally retains a spring 284 against the upper end of a groove 288 (Fig. 3) formed in the link 212 until the margin of the heel-seat portion of the sole has been initially clamped against the matrix plate 36 and that upon continued downward movement of the treadle 264 the pin 284 is moved to the bottom of the groove 286. In order to insure that the step 274 is held in engagement with the arm 276 while the heel-seat portion of the sole is distorted, the lever 272 is swung with considerable force into its rearward position through the spring 285. Power is supplied to the shaft 290 through a belt-driven pulley 292. Rotation of the cam 283 causes an arm 294, which is attached to the shaft 290 and is provided with a cam roll 296 is shaped and arranged for engagement with a cam groove 298, to swing downwardly and thus to impart downward movement to the rod 254 through the above-described mechanism.

Movement of the knives 42 is effected by providing a connecting rod 300 (Figs. 1 and 3) which is pivotally secured at its upper end to the operating slide 218 and at its lower end to the arm 294 respectively. In order to form the heel-breast receiving shoulders 34 before the heel-seat portion of the sole is substantially distorted, the knives 42 are adjusted to the desired position and are guided in the forming of the heel-breast receiving shoulder 34.
are set in motion by the cam 288 before the bulger 46 is operated by the cam. As the treadle 264 is lowered by foot pressure the presser member 40 and the bulger 46 are moved to positions illustrated in Fig. 4 and the step 274 is swung to a position beneath but spaced from the arm 276. Upon further downward movement of the treadle 264 against the pressure of spring 205 the lever 286 is tripped to pivot into an mortion the cam 288. Movement of the cam 288 is immediately imparted to the shoulder-forming knives 42 which start to move toward the crease plate 36. As the shoulder-forming knives 42 move past the forward edges 44 of the crease plate, the arm 276 engages the step 274 and lowers the bulger 46 and continues to move the shoulder-forming knives 42 downwardly with the bulger until the knives extend approximately one-eighth of an inch below the lower surface of the matrix plate 36, as shown in Fig. 6.

The lost-motion in the bulger-operating mechanism due to the providing of a gap between the step 274 and the arm 276 determines the lead of the shoulder-forming knives 42 over the bulger 46. It will be understood that the size of the gap may be varied to increase or decrease the amount of lead of the shoulder-forming cutter 42 over the bulger by forming the step 274 upon a removable abutment 275, the lever 272 being constructed and arranged to receive interchangeably one of a plurality of abutments of different shapes. The step 274 may, if desirable, be modified for adjustment relatively to the lever 272.

As above stated, it is sometimes necessary to exert three thousand pounds pressure in distorting the central part of the heel-seat portion of a thick sole which is not in temper. Accordingly, during each cycle of operation of the machine the cylindrical housing 152 is moved against the bearing portion 132 of the main frame which serves as a stop to limit the downward movement of the bulger 46. By driving the bulger through the spring 256 the operating parts which are used to distort the heel-seat portion of the sole are not strained when the cylindrical housing 152 engages the stop 132.

The tongue-forming cutter 48 is secured by mechanism which will later be described, to a slide 302 (Fig. 2) mounted for movement forwardly and rearwardly of the machine along a guideway 304 of the main frame. The slide 302 is operated by a link 306 pivotally connected to a bell-crank lever 308 positioned upon a pin 310 secured to the main frame, the forward end of the lever 308 being pivotally connected to a link 312 having at its lower end a cam follower 314 (Fig. 1) shaped and arranged to engage within a guideway 316 of the cam 288.

The illustrated cutting edge of the knife 48 (Fig. 15) is incised to correspond to the curvature of the rear faces of the shank portions 196 (Fig. 10) of the shoulder-forming knives 42. The cutting edge of the knife 48 has the general form of a chisel, the pressure of the knife against the work tending to retain the cutting edge in engagement with the bottom face of the matrix plate 36.

To facilitate the placing of the tongue-forming knife 48 in the machine without having to adjust the same when changing from one style of work to another, the knife 48 is provided with a carrier 318 (Fig. 15) having undercut slot shaped to receive a shank portion 322 of the knife and carrying a screw 324. The knife 48 may be adjusted relatively to the carrier 318 by loosening a set screw 326 and turning the screw 324 which is in threaded relation with a block 328 having a depending portion shaped to fit an opening 330 of the shank portion 322 of the knife. After effecting such adjustment the set screw 326 is tightened to clamp the knife 48 to the carrier 318. The lateral portions 332 of the carriage 318 are constructed and arranged for reception in correspondingly shaped guideways formed in the bulger 46. A lug 354 of the operating slide 302, the carrier 318 being secured against movement lengthwise of the guideways by a screw 336 carried by the transversely extending lug 354 and constructed for reception within a threaded opening 338 of the carrier 318.

The heel-seat reducing or tongue-forming knife 48 (Fig. 6) forces the heel end of the shoe away from the matrix plate 36 as it reduces the heel-seat portion of the sole and causes the shoe progressively to pivot about the heel-breast line 52 of the sole. When the heel-breast receiving shoulders 34 are formed prior to reducing the heel-seat portion of the sole it will be clear, as above explained, that since the heel-seat portion of the sole is held against movement by its margin which is to be removed from the sole, there is only a thin strip of uncut marginal material to hold the sole and the shoe from moving forwardly as the tongue-forming cutter 48 arrives at a position adjacent to the breast line 52. Accordingly, when the cutter 48 is about a sixteenth of an inch away from the previously formed heel-breast receiving shoulders the forward pressure of the tongue-forming cutter 48, especially when such cutter is dull, causes the U-shaped chip trimmed from the heel-seat portion of the sole to be torn from the sole along the lateral portions of the base of the tongue 32. When the operator does not permit the shoe to pivot as above described there is a tendency for the U-shaped chip to be torn from the sole even though the cutter 48 is sharp, since the cutter 48 then forces the shoe upper below the crease plates and away from the clamped margin of the heel-seat portion of the sole.

In order to insure that the chip is not pulled from the sole as above described, the shoulder-forming knives 42 of the illustrated machine move approximately an eighth of an inch below the bottom face of the matrix plate 36 and are temporarily held in such position until the tongue-forming knife 48 has removed the U-shaped chip 340 (Fig. 21) from the heel-seat portion of the sole. The shoulder-forming knives 43, which serve as supports against which the shoe pivots as the tongue-forming knife 48 approaches the heel-breast line of the sole, prevent the shoe from being moved forwardly by the tongue-forming cutter 48 and serve as anvils against which the tongue-forming cutter acts, thereby insuring that clean-cut dihedral angles are formed where the lateral margins of the reduced heel-seat portion of the sole join the respective heel-breast receiving shoulders 34.

In order to dispose of the U-shaped chip 340, which after the heel-seat fitting operation remains on the matrix plate 36, the illustrated machine is provided with an ejector 344 (Fig. 2) which is mounted for swinging movement upon the screw 346 carried by the bearing housing 132 and is automatically moved forwardly as the rod 134 is actuated, thereby forcing the chip 340 off the matrix plate 36. The ejector 344 is normally held in its rearward position shown in Fig. 2 by a spring 346, the extent of rearward movement of the ejector being limited by engagement...
of a projection 348 of the ejector with a stud 350. The ejector 344 is swung forwardly of the machine as the rod 134 is raised by a latch 352 which is mounted upon the housing portion 14 of the sleeve 130 and is normally held in an upright position by a spring 354. When the rod 134 is in its lowered position the latch 352 swings under an arm 356 of the ejector and as the rod is raised after the completion of the heel-seating operations which actuates the ejector forwardly, the latch being mounted to swing to its rearward position under the pressure of the spring 354 after the rod 134 has moved to its raised position.

Although the illustrated machine has been described with reference to Cuban work, it will be understood that parts of the machine may be replaced by other parts to equip the machine for effectively operating upon Louis work. In Cuban work, as already stated, the heel-breast receiving shoulders 54 are curved transversely along the sole as illustrated in Fig. 19 and for this reason the forward edges 44 of the matrix plate 36, the cutting edges of the shoulder-forming knives 42, and the cutting edge of the heel-seat reducing or tongue-forming knife 46 are correspondingly curved, as already explained, the heel-breast receiving shoulders 50 (Fig. 20) lie in the same plane and extend substantially at right angles to the median plane of the sole. Accordingly, when operating upon Louis work the forward edges of the matrix plate are straight and in alignment with each other.

The inner corners 358 of the shoulder-forming knives 42 (Fig. 10) are slightly raised with respect to the outer corners 360, the cutting edges of the knives being inclined at about 61° to the plane of the sole.

It will be understood that different forms of presser members may be substituted for the presser member 40. The presser member 192 illustrated in Fig. 13 is similar to the presser member 40 but has the forward lateral parts 362 of its leg portions 364 pivotally mounted on screws 46 carried by parts 367 of the leg portions which are illustrated as formed integral with the plate 368. The forward portions of the sole-engaging faces of the parts 362 normally project slightly beyond the faces of the parts 367 since they are urged away from the plate by springs 370, respectively, in order to insure that the margin of the heel-seat portion of the sole positioned adjacent to the breast line 52 is clamped securely against the matrix plate 36. By providing leg portions 364 having pivotally movable parts 362, the forward marginal parts of the heel-seat portion of a sole may be effectively clamped to the matrix plate 36 even though one of such parts is much thicker than the other.

Fig. 16 illustrates a presser member 194 comprising a plate 374 and a U-shaped sole-engaging member 372 which is constructed of resilient material, such as rubber. The inside wall of the member 372 which, when inserted in the machine, overlaps the edge 70 of the U-shaped opening, is braced by a metal plate 376 to prevent the size of the interior of the U of the sole-engaging member 372 from being reduced when such member is forced against the matrix plate 35.

The plates 368, 374 of the presser members 192, 194, respectively, are constructed and arranged to fit into the slots 146 which flare rearwardly to permit the presser members to pivot about the forward ends of the slots, as described in connection with the presser member 40. The plates 172, 180, respectively, are held in lowered position in the slots 148 by the spring-pressed plunger 186 when the rod 134 has been raised. Although each of the presser members 40, 192 and 194 has been illustrated as mounted for tilting movement as a unit, it has been found that the presser members may be advantageously used even though the plates 172, 180 and 374 of these members respectively, are rigidly secured to the housing 142 and in a complete run of sizes of shoes having Cuban heels it is customary to use matrix plates 36 provided with openings 38 of three different sizes, according to the size of the reduced heel-seat portion or tongue 32 desired. When one matrix plate has been substituted for another, the operator replaces the presser member 40 and the bulger 46 in the machine by another presser member and bulger respectively, corresponding in size to the opening of the matrix plate in the machine.

When it is desired to operate upon Louis work, the shoulder-forming and the heel-seat reducing knives 42 and 48 respectively, as well as the matrix plate 36, the presser member 40 and the bulger 46 are replaced by corresponding members constructed and arranged effectively to trim soles for the reception of Louis heels. After the knives 42 have been sharpened the carrier head 204 is adjusted relatively to the block 214 in order that it will engage the shoulder-forming knives 42 at the forward end of the heel-seat reducing stroke. To obviate the setting up adjustment of the shoulder-forming and the heel-seat reducing knives 42, 48, respectively every time that the machine is to be equipped to operate upon a different type of work, it is customary to remove the carrier 218 and the knife 48 as a unit from the machine after removing the screw 336 and they will extend approximately one-eighth of an inch below the matrix plate 36. The heel-seat reducing knife 48 after being sharpened is also adjusted relatively to its carrier 318 in order that it will engage the shoulder-forming knives 42 at the forward end of the heel-seat reducing stroke.

As already explained it is sometimes advantageous to provide the machine with shoulder-forming cutters 237 (Figs. 23, 24 and 26) which move laterally in the sole. With this view in mind the illustrated machine is equipped with a cutter carrier 380 comprising a rack bar 386 mounted in a dovetail slide way 388 of the carrier. The rack bar 386 is clamped to the projecting arm 218 of the operating slide 216 by a part of the screw 383 which passes through vertically disposed elongated slots 384 of a knife-supporting portion 391 of the carrier and are provided with enlarged heads 390.
upon which the knife-supporting portion 391 rests.

The carrier 380 can be quickly substituted for the carrier head 204 after replacing the gib 242 (Figs. 1 and 2) by a gib 392 which has a hooked end portion 394 provided with a cylindrical recess 396 of suitable size to receive a bolt 398 secured to the top of the carrier 380 and adjustable relatively to the same through a nut 400 in order to vary the limit of the downward movement of the knives 378. It will be noted that as the arm 226 moves downwardly from the position illustrated in Fig. 23, the carrier 380 also moves downwardly due to its weight until the head of the bolt 398 engages the hook portion 394 of the gib 392. As the arm 226 of the operating slide 218 continues its downward movement it actuates the rack bar 390 downwardly relatively to the knife-supporting portion 391 thereby operating the knives 378 transversely of the sole to form the heel-breast receiving shoulders 34.

The rack bar 390 (Fig. 24) is normally held in a raised position relatively to the knife-supporting portion 391 of the carrier 382 by a spring 404 and comprises a rack 406 constructed and arranged to mesh with a pinion 408 mounted for rotation on a shaft 410 to which a cam 412 is secured. In order to operate the cutters or knives 378 the carrier is provided with a pair of arms 414 mounted for pivot movement upon bearings 416 respectively and carrying at their upper ends cam rolls 418 which are held in engagement with the cam 412 by a spring 420 secured to the upper ends of the arms 414.

The knives 378 are guided for rectilinear movement transversely of the sole upon knife blocks 422 which are movable along dovetail guideways 424 (Fig. 24) shaped to receive correspondingly shaped extensions 426 of the blocks 422, respectively. To permit each of the blocks 422 to move in a rectilinear path, the pivotally mounted arms 414 are universally secured to their respective knife blocks 422.

The angle which the guideways 424 form with the median line of a sole positioned upon the matrix plate 36 may be varied to form heel-breast receiving shoulders disposed at different angles to the median line. This adjustment is effected by swinging a pair of arcuate plates 428 in which the dovetail guideways 424 are formed into different angular positions along an arcuate guideway 430, after releasing, by loosening a screw 432 mounted in the frame of the cutting-supporting portion 402, a pair of wedge plates 434 which secure the arcuate plates 428 in adjusted position. The arcuate plates 428 may be conveniently adjusted by turning a screw 436 (Fig. 25) which is threaded in relation with rearward extensions of the plates 428 and through which the plates may be moved in equal and opposite directions along the arcuated guideway 430.

The shank portions of the knives 378 may be inclined at different angles to the plane of a sole positioned upon the plates by providing each of the blocks 422 with an arcuate slot 438 shaped to receive a screw 440 carried by a bracket 442 to which the knives 378 is secured. The underside of the block has a cylindrical surface 444, the radius of curvature of which is approximately equal to the distance from the cutting end of the knife to the surface 444. Each of the knives 378 is positioned upon and secured to its respective bracket 442 by a clamp screw 446 (Fig. 23) which is constructed for reception in a slot 448 of the bracket.

From the foregoing description it will be clear that after the downward movement of the knife-supporting portion 391 of the carrier 380 is arrested by the hook portion 394 of the gib 392, further downward movement of the arm 226 operating through the described mechanism causes the cam 412 to operate the knives 378 transversely of the sole. The bolt 398 is generally so adjusted that the knife-supporting portion 391 of the carrier comes to rest when the knives 378 extend slightly below the forward edges 44 of the grease plates 370. After the arm 226 is swung toward each other to form the heel-breast receiving shoulders 34 upon further downward movement of the rack bar 390. As in the construction above described, after forming the heel-breast receiving shoulders 34, the operating arm 226 is temporarily stopped to permit the tongue-forming knife 48 to engage the shoulder-forming knives 378 which support the sole against the cutting action of the tongue-forming knife 48 and operate as an anvil against which the tongue-forming knife 48 cuts.

By raising the knives 378 vertically at the end of each trimming operation, the work may be conveniently presented to the machine with a minimum amount of lateral movement of the shoulder-forming knives 378. If desirable, however, the knife-supporting portion 391 may be adjusted to the sole main frame and the knives may have a greater lateral movement imparted to them in order to enable the operator conveniently to position the work in the machine. Although the knives have been described as serving as anvils against which the tongue-forming knife 48 cuts, it will be understood that the knives 378 may be constructed and arranged for movement away from the sole as soon as they have completed the shoulder-forming operation.

In fitting the heel-seats of shoes for the reception of Louis heels it is sometimes the practice to provide a reduced heel-seat portion or tongue 450 (Fig. 26) and to form at opposite sides of the base of the tongue a pair of laterally extending shoulder forming knives 452 which are included in the concave attaching face of the heel, the portions of the shoulder which are positioned adjacent to the tread face of the sole being in engagement with the forward edge of the lip of the heel, as illustrated in Fig. 28.

In order to equip the above illustrated machine for preparing heel-seats such as above described, the operator removes the matrix plate 36 from the machine and replaces it by a short matrix plate 454 (Figs. 26 and 27), and also substitutes a sole-distorting plate 446, together with a carrier 458 secured to the plate by a bolt 460, in place of the shoulder-forming knives 42 and the carrier head 204. A presser member 40 and a bulger 46 corresponding in size and shape to the opening 38 of the matrix plate 454 are also incorporated in the machine.

The plate carrier 458 is secured by screws 220 to the block 314 which is clamped to the projecting arm 228 of the plate 218 by screws 216. Heightwise adjustment of the carrier 438 relatively to the block 314 may be effected as above described in connection with the carrier head of the machine.

After the shoe, the forward part of which is
gripped by the operator, is positioned in the machine, the operator lowers the presser member 40 to clamp the sole. When the power-operating mechanism is actuated the distorting plate 450 is moved downwardly until the forward edge 465 of its lower planar face 464 is substantially in alignment with the path of movement of the cutter 48, thereby depressing the lateral margins of the sole which are positioned immediately rearwardly of the breast line 52 of the sole across the path of movement of the cutter 48. While the plate 450 distorts the sole as described above, the bulger 46 forces the central part of the heel-seat portion of the sole through the U-shaped opening 38. When the sole has been distorted as illustrated in Figs. 26 and 27 the cutter 48 is moved forwardly of the sole until it passes the forward edge 465 in order to provide the reduced heel-seat portion 450 (Fig. 28) of the sole and to form the heel-breast receiving shoulders 452.

The angle 462 (Fig. 28) formed between the lower face 464 of the plate 450 and the path of movement of the cutter 448 determines the degree of inclination of the shoulder 462 with respect to the plane of the sole. The greater the angle 462 the greater the angle formed between the shoulders 452 and the plane of the sole. The angle of inclination of the lower face 464 of the plate 450 with respect to the path of movement of the cutter 48 may be readily changed by adjusting the guide member 232 about the eccentric pin 224, as above described.

When soles are operated upon in the machine equipped as illustrated in Figs. 26 and 27, it is desirable to pinch the forward lateral margins of the heel-seat portion of the sole between the plate 450 and the forward edges of the crease plate 244 in order to control the portions of the leather in which the shoulder-forming incisions are made. To insure that soles of various thicknesses may be pinched between the plate 450 and the crease plate 244 while maintaining a constant angle 462, the plate 450 is mounted for slight adjustment longitudinally and transversely of the sole. Such longitudinal adjustment of the plate 450 may also be used for initially positioning the sole with reference to matrix plates 454 of different lengths.

As already stated, it is desirable initially to adjust the shoulder-forming knives lengthwise of the matrix plate 36 to insure that the knifes will move past the breast edges 44 of the plate as they are reciprocated along their respective paths. Moreover, as above stated, provision should be made for initially adjusting the distorting plate 456 lengthwise of the matrix plate 454. In order to adjust the shoulder-forming knives 42 and the distorting plate 456 lengthwise of the matrix plate, the rod 240 upon which the eccentric pin 234 is mounted may be rotatably adjusted in the main frame 56 as already stated. As the rod 240 is rotatably adjusted the guide member 232 swings in an arc of a circle, but since the slide 218 is held against vertical movement by the connecting rod 300, the knives 42 which are rigidly secured to the slide 218 move in a line extending substantially lengthwise of the matrix plate.

In order to perform the heel-seat fitting operation the operator places a heel of a predetermined size, attaching face down, upon the table 10 with its front in engagement with the block 90 and then operates the lever 96 until the abutment 92 is moved into engagement with the rear part of the rim of the attaching face of the heel. The heel-seat portion of the sole of the shoe is then positioned upon the matrix plate by pushing the shoe rearwardly of the machine against the bifurcated portion 84 and the back gage 74 until it is positioned in alignment with the abutment 92. As the shoe is being positioned the operator glances at the index members 118, 120 which move into alignment when the back gage engages the stop plate 78. The operator also glances along the arm 122 to centralize the shank portion of the shoe.

The operator, after positioning the shoe, steps on the treadle 264 to lower the presser member 40 against the margin of the heel-seat portion of the sole thereby initially clamping the same in the machine. Upon continued downward movement of the treadle 264 the shoulder 274 of the lever 272 is swung underneath the arm 276 which, after the trip lever 283 throws a one-revolution clutch into operation, causes the presser member 40 to exert a secondary pressure against the margin of the heel-seat portion of the sole and also causes the bulger 46 to force the central part of the heel-seat portion of the sole through the U-shaped opening 38 of the matrix plate 36.

Before the sole is distorted by the bulger 46 the shoulder-forming knives 42, which lead the bulger 46 and are moved with the bulger as above described, form the heel-breast receiving shoulders 452. When the bulger 46 reaches the bottom of its stroke the shoulder-forming knives 42 project approximately an inch below the crease plate 244, as described in the matrix plate 36 and are stopped until the heel-seat reducing cutter 48 moves forwardly of the sole to reduce the heel-seat portion of the sole.

The shoulder-forming knives 42 during their period of rest support the sole against displacement under pressure of the heel-seat reducing cutter 48 and serve as anvils against which the cutter operates. After the sole is trimmed the operator removes his foot from the treadle 264 and takes the shoe out of the machine.

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

1. A heel-seat fitting machine having, in combination, a cutter for forming heel-breast receiving shoulders upon a sole, another cutter for forming a tongue at the heel-seat portion of the sole, means for causing the first-named cutter to form heel-breast receiving shoulders upon the same, and then temporarily to remain stationary, and mechanism constructed and arranged to operate in timed relation with the shoulder-forming cutter for moving the heel-seat reducing cutter forwardly of the sole and against the shoulder-forming cutter.

2. A heel-seat fitting machine having, in combination, a cutter for making incisions in a sole to form heel-breast receiving shoulders upon the same, a cutter for reducing the heel-seat portion of the sole, means for moving the heel-seat reducing cutter forwardly of the sole to said incisions, and mechanism constructed and arranged to operate in timed relation with the heel-seat reducing cutter and to cause the shoulder-forming cutter to remain in the incisions as the heel-seat reducing cutter moves forwardly of the sole thereby to brace the sole against the operating pressure of the heel-seat reducing cutter.

3. A heel-seat fitting machine having, in combination, an oscillating knife constructed and arranged to form heel-breast receiving shoulders upon a sole attached to a shoe upper, an oscillat-
ing knife movable forwardly of the sole to reduce the heel-seat portion of the sole, said shoulder-forming knife being shaped and arranged to support the sole against forward displacement by the said guide knife and to serve as an anvil against which the heel-seat reducing knife cuts and means for operating the shoulder-forming knife to form heel-breast receiving shoulders upon the sole and for causing such knife to remain in said position while the heel-seat reducing knife is operating upon the sole.

4. A heel-seat fitting machine having, in combination, a pair of oscillating knives constructed and arranged to make incisions in a sole attached to a shoe upper thereby to form heel-breast receiving shoulders upon the sole, a knife movable forwardly of the sole to reduce the heel-seat portion of the same, and means for operating the shoulder-forming knives to form heel-breast receiving shoulders upon the sole and for causing such knives temporarily to remain at rest in said incisions while the heel-seat reducing knife is operating upon the sole thereby to support the sole against forward displacement by the heel-seat reducing knife and to serve as anvils against which the heel-seat reducing knife cuts.

5. In a machine for fitting the heel-seat portion of soles in the reception of Cuban heels, a pair of shoulder-forming cutters spaced from each other and each having a curved cutting edge and a convex shank portion, and a cutter provided with a concave cutting edge and mounted for movement in a predetermined path to trim the margin of the heel-seat portion of the sole thereby to form a reduced heel-seat portion of the sole, said shoulder-forming cutters being mounted for movement across said path and being arranged to cause their convex shank portions to serve as cutting blocks against which the concave cutting edge of the heel-seat reducing cutter operates.

6. A heel-seat fitting machine having, in combination, a matrix plate, a cutter for forming heel-breast receiving shoulders upon a sole mounted upon said plate, means cooperating with the matrix plate to distort the heel-seat portion of the sole, a cutter mounted for movement in a plane forwardly of the sole to reduce the heel-seat portion thereof, means for operating the heel-seat reducing cutter, and mechanism constructed and arranged to operate the shoulder-forming cutter in timed relation with the heel-seat reducing cutter and to move the shoulder-forming cutter across the plane of movement of the heel-seat reducing cutter and temporarily to restrain the same against movement as the heel-seat reducing cutter moves forwardly of the sole thereby to support the sole against the cutting pressure of the heel-seat reducing cutter to cause the shoulder-forming cutter to serve as an anvil against which the heel-seat reducing cutter operates.

7. A heel-seat fitting machine having, in combination, a matrix plate, a cutter for forming heel-breast receiving shoulders upon the sole of a shoe mounted upon said plate, a plunger constructed and arranged for cooperation with the plate to distort the heel-seat portion of the sole, another cutter mounted for movement forwardly of the sole to reduce the heel-seat portion of the distorted sole, means for operating the heel-seat reducing cutter, and mechanism constructed and arranged to operate the plunger and the shoulder-forming cutter in timed relation with the heel-seat reducing cutter and temporarily to stop the plunger in its sole-distorting position, said mechanism also being constructed and arranged temporarily to stop the shoulder-forming cutter when it has completed the shoulder-forming cuts thereby to cause the cutter to support the sole against the cutting action of the heel-seat reducing cutter and to serve as an anvil against which the heel-seat reducing cutter operates.

8. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening and having breast edges, spaced knives movable past the respective breasts of the plate to form heel-breast receiving shoulders upon the sole of a shoe mounted upon the plate, a bulger constructed and arranged to force the central part of the heel-seat portion of the sole through the U-shaped opening and past a face of the plate, a drag knife mounted for movement along said face and forwardly of the sole to reduce the heel-seat portion of the sole, means for operating the drag knife, and mechanism operating in timed relation with said means constructed and arranged to operate the bulger and to cause the shoulder-forming knives temporarily to stop when they have moved a short distance beyond said face of the matrix plate and to support the sole against movement under pressure of the drag knife, as well as to serve as anvils against which the drag knife operates.

9. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a presser member constructed and arranged to clamp the margin of the heel-seat portion of a sole against the matrix plate, a cutter to form heel-breast receiving shoulders on the sole, a bulger to force the central part of the heel-seat portion of the sole through the opening, another cutter to trim the margin of the heel-seat portion of the sole, and mechanism to operate the shoulder-forming cutter to form said heel-breast receiving shoulders prior to operating the bulger and the second-named cutter thereby to form said heel-breast receiving shoulders before the heel-seat portion of the sole is substantially distorted.

10. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a presser member constructed and arranged to clamp the margin of the heel-seat portion of a sole against the plate, a cutter to form heel-breast receiving shoulders on the sole, a bulger to force the central part of the heel-seat portion of the sole through the opening, another cutter mounted for movement in a predetermined path to trim material from the margin of the distorted heel-seat portion of the sole thereby to provide a reduced heel-seat, mechanism to operate the shoulder-forming cutter before the heel-seat portion of the sole is substantially distorted by the bulger and to cause such cutter to move beyond the path of movement of the second-named cutter and to remain stationary when moved beyond said path thereby to support the sole against the cutting action of the second-named cutter, means to operate the shoulder-forming cutter in timed relation with the bulger and the second-named cutter.

11. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening and constructed to support the heel-seat portion of a sole, a presser member to clamp the margin of the heel-seat portion of the sole against the plate, a pair of knives movable substantially at right angles to the plane of the sole to form
heel-breast receiving shoulders at opposite sides of the sole, a bulger mounted for movement to force the central part of the heel-seat portion of the sole through the opening and the heel-breast portion, and to trim the margins of the same, and to move the knives with the bulger to cause the knives to project across the path of movement of said cutter and to come to rest with the bulger thereby to serve as annull against which the cutter operates.

12. A shoe-positioning device having, in combination, a slide mounted for movement under pressure of a shoe, a stop constructed and arranged for engagement with the slide to limit the movement of the same, means mounted for adjustment to a predetermined position in accordance with the length to which it is desired to trim the shoe, a mechanism to move the stop into correlated position with respect to said means, a visible indicator movable with said means, and another visible indicator movable with the slide and arranged to assume a predetermined recognizable position relatively to the first-named indicator when the slide engages said stop.

13. A heel-seat fitting machine having, in combination, a sliding gage to engage a shoe having an attached sole, said gage being mounted for movement under pressure of the shoe, a stop constructed and arranged for engagement with said gage to limit the movement of the same, means mounted for adjustment to a predetermined position in accordance with the length to which it is desired to trim the sole for the reception of a heel, mechanism to move said stop into correlated position with respect to said means, a visible indicator movable with said means, and another visible indicator movable with said gage and arranged to assume a predetermined recognizable position relatively to the first-named indicator when the gage engages said stop.

14. A heel-seat fitting machine having, in combination, a stop, a member constructed and arranged to position the counter portion of a shoe having an attached sole widthwise, a gage to engage the rear end of the shoe and movable under pressure of the shoe against the stop, means mounted for adjustment to a predetermined position in accordance with the length to which it is desired to trim the sole for the reception of a heel, mechanism responsive to the movement of said means for positioning the stop in correlated relation with respect to said means, and means for trimming surplus material from the margin of the heel-seat portion of the sole.

16. A heel-seat fitting machine having, in combination, a V-shaped member to engage opposite sides of the counter portion of a shoe having an attached sole whereby to position the rear portion of the sole widthwise, a gage to engage the rear end of the shoe and movable under pressure of the shoe, a stop to limit the movement of the gage, a heel gage for measuring the length of a heel, mechanism connecting the heel gage and the stop, a visible indicator movable with said heel gage, and another visible indicator movable with said shoe gage and arranged to assume a predetermined recognizable position with respect to the first-named indicator when the shoe gage engages said stop.

17. A heel-seat fitting machine having, in combination, a V-shaped member to engage opposite sides of the counter portion of a shoe having an attached sole whereby to position the rear portion of the shoe widthwise, a back gage to engage the rear end of the counter portion of the shoe and movable under pressure of the shoe, a stop to limit the movement of the back gage, a heel gage for measuring the length of a heel, mechanism connecting the heel gage and the stop, a visible indicator movable with said heel gage, and another visible indicator movable with said back gage and arranged to assume a predetermined recognizable position with respect to the first-named indicator when the back gage engages said stop.

18. A heel-seat fitting machine having, in combination, a back gage mounted for sliding movement under pressure of a shoe, a movable stop constructed and arranged for engagement with said gage to limit the movement of the back gage, a heel gage provided with a movable member constructed and arranged to measure the length of a heel and rigidly secured to the stop, a visible indicator connected to the movable member, and another visible indicator connected to the back gage and arranged to assume a predetermined recognizable position with respect to the first-named indicator when the back gage is in engagement with the stop.

19. A heel-seat fitting machine having, in combination, a V-shaped member to engage opposite sides of the counter portion of a shoe whereby to position the rear portion of the shoe widthwise, a back gage movable under pressure of the shoe, a stop to limit the movement of the back gage, resilient means normally to force the back gage and the V-shaped member away from the stop, a heel gage provided with a movable arm to measure the length of a heel, mechanism connecting the arm and the stop, a visible indicator movable with the arm, and another visible indicator movable with said back gage and arranged to assume a recognizable position with respect to the first-named indicator when the movement of the back gage has been limited by said stop.

20. In a heel-seat fitting machine, a matrix plate provided with an opening, a member constructed and arranged to press the margin of the heel-seat portion of a sole against the matrix plate, and a bulger to force the central part of the heel-seat portion of the sole through the opening, said member comprising a plurality of
parts at least one of which is movable under pressure relatively to the other parts.

21. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a member to clamp the margin of the heel-seat portion of a sole against the matrix plate, and a bulger to force the central part of the heel-seat portion of the sole through the opening while the margin of the heel-seat portion of the sole is clamped against the plate thereby to pull the heel-seat portion of the sole around the bulger, said presser member being mounted for tilting movement relatively to the plate as it is pressed against the sole.

22. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening, an operating member movable toward and away from the plate, a presser member pivotally mounted upon said member and constructed and arranged to clamp the margin of the heel-seat portion of a sole against the plate, and a bulger secured to the operating member and constructed and arranged to force the heel-seat portion of the clamped sole through the opening.

23. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening, an operating member movable toward and away from the plate, a U-shaped presser member pivotally mounted upon the operating member and constructed and arranged to clamp the margin of the heel-seat portion of a sole against the crease plate, and a bulger secured to the operating member and constructed and arranged to force the central part of the heel-seat portion of the sole through the opening, said presser member comprising leg portions to engage the lateral margins of the heel-seat portion of the sole and a bight portion yieldable relatively to said leg portions and constructed and arranged to engage the rear margin of the heel-seat portion of the sole.

24. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a U-shaped presser member comprising a part to clamp the margin of the heel-seat portion of a sole against the plate, and a bulb to force the central part of the heel-seat portion of the sole through the opening, said first-named part being mounted for movement relatively to the second-named part.

25. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a U-shaped presser member comprising a part to clamp the rear margin of the heel-seat portion of a sole and parts to clamp the lateral margins of the heel-seat portion of the sole against the plate, and a bulger to force the central part of the heel-seat portion of the sole through the opening, said first-named part being mounted for movement relatively to the second-named part.

26. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, and a plunger, said plunger comprising a presser member to clamp the margin of the heel-seat portion of a sole against the plate and a bulger to force the central part of the heel-seat portion of the sole through the opening while the margin of the heel-seat portion of the sole is clamped against the plate thereby to pull the heel-seat portion of the sole around the bulger, said presser member being mounted for tilting movement relatively to the plate as it is pressed against the sole.
and means normally to force the face of the bight portion beyond the faces of the side portions.

34. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening, a U-shaped presser member made of yieldable material shaped and arranged to clamp the margin of the heel-seat portion of a sole against portions of the matrix plate surrounding the opening, and a rigid member secured to the inside of the U to insure that the shape of the inside of the U will not be substantially changed when the sole is clamped to the plate.

35. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a U-shaped presser member made of yieldable material and constructed and arranged to overlap the edge of said opening and to clamp the margin of the heel-seat portion of a sole against portions of the matrix plate surrounding the opening, and a rigid member secured to the inner wall of the U to insure that the shape of the inside wall of the U will not be substantially changed when the sole is clamped against the plate.

36. In a heel-seat fitting machine, a matrix plate, a U-shaped presser member including a bight portion and a pair of leg portions constructed and arranged to force the margin of the heel-seat portion of a sole against the matrix plate, each of said portions being yieldingly mounted for movement relatively to the other portions to insure that a substantial part of the margin of the heel-seat portion of the sole will be clamped against the plate even though the margin varies in thickness.

37. A heel-seat fitting machine having, in combination, a matrix plate, an operating member mounted for movement relatively to the matrix plate, a U-shaped presser member comprising a plurality of sections and mounted for movement with the operating member to clamp the margin of the heel-seat portion of a sole against the matrix plate, said presser member being yieldingly mounted for movement as a unit relatively thereto, said sections being yieldingly mounted relatively to each other to insure that the sole will be clamped along substantially the entire margin of its heel-seat portion irrespective of substantial variations in the thickness of the sole along such margin.

38. A heel-seat fitting machine having, in combination, a matrix plate, a U-shaped presser member, an operating member for carrying the presser member and mounted for movement relatively to the plate, said presser member comprising a plurality of sections constructed and arranged to clamp the margin of the heel-seat portion of a sole against the plate and being mounted for rocking movement as a unit relatively to the operating member, and said sections being mounted for rocking movement relatively to each other to insure that the heel-seat portion of the sole will be clamped along substantially its entire margin irrespective of varying thicknesses of such margin.

39. A heel-seat fitting machine having, in combination, a matrix plate, an operating member, and a U-shaped presser member carried by the operating member and mounted for pivotal movement with a U-shaped opening, an operating rod constructed and arranged interchangeably to receive one of a plurality of bulgers of different sizes and shapes, and a sleeve comprising a housing portion slidably mounted upon the rod and constructed and arranged interchangeably to receive one of a plurality of presser members of different sizes and shapes.

41. A heel-seat fitting machine having, in combination, a matrix plate, an operating member, a U-shaped presser member carried by and pivotally mounted for movement relatively to the operating member, said presser member being provided with a bight portion and side portions each of which has a sole-engaging face, said bight portion being mounted for yielding movement relatively to the side portions, and means normally to force the face of the bight portion beyond the faces of the side portions.

42. A heel-seat fitting machine having, in combination, a matrix plate, an operating member, a U-shaped presser member carried by and pivotally mounted for yielding movement relatively to the operating member, said presser member being provided with a bight portion and side portions each of which has a sole-engaging face and said side portions and said bight portion being pivotally mounted for movement relatively to each other, and springs normally to force the face of the bight portion beyond the faces of the side portions.

43. In a heel-seat fitting machine, a matrix plate, an operating member, and a U-shaped presser member carried by the operating member and pivotally mounted for yielding movement as a unit relatively thereto about an axis extending transversely of the presser member and positioned near the open end of the U, said presser member comprising side portions and a bight portion pivotally mounted for movement relatively to the side portions.

44. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a presessor member to clamp the margin of the heel-seat portion of a sole against the matrix plate, a bulger to force the central part of the heel-seat portion of the sole through the U-shaped opening, an operating rod constructed and arranged interchangeably to receive one of a plurality of bulgers of different sizes and shapes, a sleeve provided with an enlarged portion constructed and arranged interchangeably to receive one of a plurality of presser members of different sizes and shapes, an abutment movable with the rod and constructed and arranged positively to move the sleeve in one direction, and means comprising a spring to cause the sleeve to move with the rod in the opposite direction and also to permit the rod to move relatively to the sleeve in such direction.

45. In a heel-seat fitting machine, a matrix plate provided with an opening, a member to clamp the margin of the heel-seat portion of a sole against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening, manually operated means to force the member against said margin of the sole, and power-operated means to cause the bulger to force the central part of the heel-seat portion of the clamped sole through the opening.

46. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a presser member to clamp the margin of the
heal-seat portion of a sole against the plate, a bulger to force the central part of the heal-seat portion of the sole through the opening preparatory to reducing the heel-seat portion, manually operated means constructed and arranged to move the presser member thereby to force said margin against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening, a treadle-operated mechanism constructed and arranged to move the presser member thereby to force said margin against the plate, power-operated means comprising a lever, and an arm connected to the said treadle-operated mechanism and movable into opposing relation with said arm for the purpose of causing the said treadle-operated mechanism being constructed and arranged to actuate said power-operated means thereby to cause the clamp to force said margin of the sole with considerable pressure against the plate and to cause the bulger to force the central part of the heel-seat portion of the clampd sole through the opening.

48. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a bulger mounted for movement to force the central part of the heel-seat portion of a sole positioned upon the plate through the opening, a stop, and a power-operated mechanism, said mechanism comprising a spring-yielding member and an abutment arranged to engage the stop during each cycle of operation of the machine thereby insuring that the central parts of heel-seat portions of soles of different thicknesses and temper will be forced through the U-shaped opening by the bulger.

49. A heal-seat fitting machine having, in combination, a matrix plate, a plunger for clamping and distorting the heel-seat portion of a sole supported upon the matrix plate, means for trimming the heal-seat portion of the sole to reduce such portion for the reception of a heel, a chip ejector mounted for movement relatively to the matrix plate, and means carried by the plunger for operating the ejector thereby to remove from the machine a chip trimmed from the sole and positioned upon the plate.

51. A heel-seat fitting machine having, in combination, a plunger constructed and arranged for cooperation with the matrix plate to clamp and to distort the heel-seat portion of a sole upon said plate, means for trimming the heel-seat portion of the sole to prepare the same for the reception of a heel, a chip ejector provided with an extension, and an arm mounted for movement with the plunger and constructed and arranged to strike the extension thereby to cause the ejector to force a chip trimmed from the sole off the matrix plate.

52. A heel-seat fitting machine having, in combination, a matrix plate, a plunger constructed and arranged for cooperation with the matrix plate to clamp and to distort the heel-seat portion of a sole upon said plate, means for trimming the heel-seat portion of the sole to prepare the same for receiving a heel, a pivoted chip ejector, a spring normally to retain the ejector in an inoperative position, and an arm mounted upon the plunger and arranged to move the ejector over the plate upon movement of the plunger away from the same thereby to remove from the machine a chip trimmed from the sole and resting upon the matrix plate.

53. A heel-seat fitting machine having, in combination, means to position the sole of a shoe, a mechanism to distort the heel-seat portion of the sole, means for trimming the heel-seat portion of a sole for the reception of a heel, an operating member, a knife carrier constructed and arranged to be readily secured to and detached from the operating member, and means to adjust the knife relatively to said carrier and to clamp the knife to the carrier.

54. A heel-seat fitting machine having, in combination, means to position the sole of a shoe, a mechanism to distort the heel-seat portion of a sole, a tongue-forming knife to reduce the margin of a shoe, a knife carrier for the reception of said knife, an operating member, a knife carrier provided with a screw and having a groove to receive a shank portion of the knife, a block threaded to receive the screw and constructed and arranged to engage the knife to adjust the same along said groove when the screw is turned, and a clamp to secure the knife and the carrier in adjusted position, said carrier being constructed and arranged to be readily secured to the operating member and to be removable therefrom.

55. A heel-seat fitting machine, a matrix plate to support the sole of a shoe, a material from the margin of the heel-seat portion of the sole, a pair of knives movable relatively to the plate to form heel-seat receiving shoulders upon the sole, a carrier mounted for movement toward and away from the matrix plate, a clamp to secure the knives to the carrier and to release the same for adjustment relatively to the carrier, a mechanism to reciprocate the knives equal distances in opposite directions in the carrier when the clamp has released the knives in order initially to adjust the same, and a mechanism to operate the knives in timed relation with said sole-reducing means.

56. A heel-seat fitting machine having, in combination, a matrix plate to support the sole of a shoe, a chip ejector provided with an extension, and an arm mounted for movement with the plunger and constructed and arranged to strike the extension thereby to cause the ejector to force a chip trimmed from the sole off the matrix plate.
portion of a sole, and knives movable in paths disposed substantially at right angles to the plane of the sole, said knives also being movable toward and away from each other transversely of the sole to form heel-breast receiving shoulders upon the same.

58. In a heel-seat fitting machine, a plate to support a sole, a cutter carrier mounted for movement in a path disposed substantially at right angles to the plane of the sole, a pair of knives movable in paths extending transversely of the sole and constructed and arranged to form heel-breast receiving shoulders upon the same, a cutter to move the knives transversely of the sole, and a cutter to trim the margin of the heel-seat portion of the sole, said knives being constructed and arranged to support the sole against the action of said cutter and to serve as anvils against which the cutter operates.

59. In a heel-seat fitting machine, a plate to support the sole of a shoe, a pair of knives movable transversely of the sole to form heel-breast receiving shoulders, and a knife to remove the margin of the heel-seat portion of the sole, said shoulder-forming knives being constructed and arranged to support the sole against the pressure of the heel-seat reducing knife and to serve as anvils against which said knife operates.

60. In a heel-seat fitting machine, a plate to support the heel-seat portion of the sole of a shoe, a pair of knives mounted for movement in paths extending transversely of the sole to form heel-breast receiving shoulders, a cutter to remove material from the margin of said heel-seat portion, said knives being constructed and arranged to support the sole against the pressure of the cutter and to serve as anvils against which the cutter operates, and mechanism to vary the path of movement of the knives.

61. A heel-seat fitting machine having, in combination, a plate to support a sole, a knife carrier mounted for movement toward and away from the sole, a pair of knives attached to the carrier and mounted for movement in paths extending transversely of the sole to form heel-breast receiving shoulders upon the same, and means to reduce the margin of the heel-seat portion of the sole, said knives being constructed and operated to support the sole against the action of said carrier, and means to serve as anvils against which said carrier operates.

62. A heel-seat fitting machine having, in combination, a plate to support a sole, a knife carrier mounted in a path disposed at a substantially right angle to the plane of the sole, mechanism to operate said carrier along said path, a pair of knives mounted upon the carrier, a cam mounted upon the carrier and constructed and arranged to operate the knives transversely of the sole and relatively to the carrier to form heel-breast receiving shoulders, and a stop to limit the movement of the carrier to cause said mechanism to actuate said cam thereby to move the knives relatively to the carrier and transversely of the sole to form said heel-breast receiving shoulders.

63. A heel-seat fitting machine having, in combination, a plate to support a sole, a knife carrier movable in a path disposed at a substantial angle to the plane of the sole, mechanism to operate the carrier along said path, a pair of knives movable with the carrier, a cam mounted upon the carrier and constructed and arranged to operate the knives transversely of the sole to form heel-breast receiving shoulders, a member movable with the carrier to operate said cam, a stop to limit the movement of the carrier to cause said mechanism to operate said member relatively to the carrier to move the knives transversely of the sole, and a cutter to trim the margin of the heel-seat portion of the sole, said knives being constructed and arranged to support the sole against the action of said cutter and to serve as anvils against which the cutter operates.

64. A heel-seat fitting machine having, in combination, a plate to support a sole, a knife carrier movable relatively to the plate, mechanism to operate the carrier, said knife carrier being provided with a pair of knives movable in paths extending transversely of the sole and constructed and arranged to form heel-breast receiving shoulders upon the sole, mechanism mounted upon the carrier to operate the knives transversely of the sole, a stop arranged for engagement with the carrier to cause said mechanism to operate said knives transversely of the sole, and means to vary the paths of movement of the knives.

65. A heel-seat fitting machine having, in combination, a plate to support the heel-seat portion of the sole of a shoe, a pair of knives movable in paths extending transversely of the sole to form heel-breast receiving shoulders upon the sole, mechanism to vary the paths of movement of said knives, and a knife to trim the margin of the heel-seat portion of the sole thereby to reduce such portion for the reception of a heel, said shoulder-forming knives being constructed and arranged to support the sole against the pressure of the heel-seat reducing knife and to serve as anvils against which the heel-seat reducing knife operates.

66. A heel-seat fitting machine having, in combination, a plate to support the heel-seat portion of a sole, a knife carrier mounted for movement in a path disposed substantially at right angles to the plane of the sole, a pair of knives supported by the carrier and mounted for equal and opposite movement in paths extending transversely of the sole to form heel-breast receiving shoulders upon the sole, and mechanism to vary the respective paths of movement of the knives to form heel-breast receiving shoulders disposed at different angles to the median line of the sole.

67. A heel-seat fitting machine having, in combination, a plate to support the heel-seat portion of a sole, a knife carrier mounted for movement toward and away from the plate, a pair of knives movable with the carrier and also mounted for movement transversely of the sole to form heel-breast receiving shoulders upon the bolster for cooperation with the plate to distort the heel-seat portion of the sole, and a knife to reduce the margin of the heel-seat portion of the sole by a beveling cut, said shoulder-forming knives being constructed and arranged to support the sole against the cutting action of the heel-seat reducing cutter and to serve as anvils against which said cutter operates.

68. A heel-seat fitting machine having, in combination, a plate to support the heel-seat portion of a sole, a knife carrier movable in a path disposed at a substantial angle to the plane of the sole, an operating member to move the carrier in said path, a pair of knives mounted upon the carrier, a cam mounted upon the carrier and constructed and arranged to operate the knives transversely of the sole thereby to form heel-breast receiving shoulders upon the sole, a stop to limit the movement of the carrier toward the plane thereby to cause said member to operate said cam for moving the knives toward each other to form said shoulders, a bolster for cooperating with the plate to distort the heel-seat portion of the sole, and a knife movable lengthwise of the sole and into engagement with said knives to reduce the heel-seat portion of the sole by a beveling cut.
69. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening and comprising a pair of planar faces which converge lengthwise of and extend substantially through-out the length of the opening and which terminate in feather breast edges positioned at opposite sides of the opening, and a beveled face which extends from one breast edge to the other and from one of said converging faces substantially to the other converging face and forms therewith a feather edge defining the opening.

70. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, means to force the central part of the heel-seat portion of a sole positioned upon the plate through the opening, a cutter movable in a predetermined path extending along and beyond the plate, a member constructed and arranged to force lateral margins of the sole which are positioned adjacent to the plate across the path of movement of the cutter, and means to move the cutter in said path to reduce the heel-seat portion of the sole and to form shoulders at opposite sides of the base of the reduced heel-seat portion, said member being adjustable relatively to the plate to vary the angle which said shoulders form with the plane of the sole.

71. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, means to force the central part of the heel-seat portion of a sole positioned upon the plate through the opening, a cutter movable in a predetermined path extending along and beyond the plate, a member having a sole-engaging face inclined to said path and constructed and arranged to force lateral margins of the sole which are positioned adjacent to an edge of the plate across the path of movement of the cutter, and means to move the cutter in said path to reduce the heel-seat portion of the sole and to form heel-breast receiving shoulders at opposite sides of the base of the reduced heel-seat portion, said member being adjustable relatively to the plate to vary the inclination of the face with respect to the path of movement of the cutter thereby to vary the angle which said shoulders form with the plane of the sole.

72. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a presser member to clamp the margin of the heel-seat portion of a sole attached to a shoe upper against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening and beyond a face of the plate, a cutter having a cutting edge movable in a predetermined path extending along and beyond said face of the plate, and a member having a face inclined to said path for forming marginal portions of the sole in the vicinity of its breast line across said path, said last-named member being mounted for angular adjustment thereby to vary the angle which said face forms with the path of movement of the cutter.

73. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a presser member to clamp a sole against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening and beyond a face of the plate, a cutter having a cutting edge movable in a predetermined path extending along and beyond said face of the plate, and a member having a face inclined to said path for forming marginal portions of the sole in the vicinity of its breast line across said path, said last-named member being mounted for angular adjustment thereby to vary the angle which said face forms with the path of movement of the cutter.

74. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a presser member to clamp the margin of the heel-seat portion of a sole attached to a shoe upper against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening and beyond a face of the plate, a cutter having a cutting edge movable in a predetermined path extending along and beyond said face of the plate, and a member having a face inclined to said path and constructed and arranged to force the marginal portions of the sole in the vicinity of its breast line across said path, and means to move the cutter in said path to reduce the heel-seat portion of the sole and form shoulders at opposite sides of the base of the reduced heel-seat portion, said last-named member being mounted for angular adjustment substantially about the forward edge of its sole-engaging face thereby to vary the angle which said face forms with said path.

75. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a presser member to clamp the margin of the heel-seat portion of a sole against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening and beyond a face of the plate, a cutter having a cutting edge movable in a predetermined path extending along and beyond the face of the plate, a member having a face inclined to said path and constructed and arranged to force the marginal portions of the sole in the vicinity of its breast line across said path, and means to move the cutter in said path to reduce the heel-seat portion of the sole and form shoulders at opposite sides of the base of the reduced heel-seat portion, said last-named member being mounted for adjustment lengthwise of the sole.

76. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a presser member to clamp the margin of the heel-seat portion of a sole against the plate, a bulger to force the central part of the heel-seat portion of the sole through the opening and beyond a face of the plate, a cutter having a cutting edge movable in a predetermined path extending along and beyond the face of the plate, a member having a face inclined to said path and constructed and arranged to force the marginal portions of the sole in the vicinity of its breast line across said path, and means to move the cutter along said face of the plate and past the face of the last-named member thereby to reduce the heel-seat portion of the sole and form shoulders at opposite sides of the base of the reduced heel-seat portion, said last-named member being mounted for adjustment lengthwise of the sole.

77. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, a presser member for clamping the margin of the heel-seat portion of the sole of a shoe against the plate, a plunger constructed and arranged to force the central part of the clamped heel-seat portion of the sole positioned upon the plate through the opening, a knife movable in a predetermined path, said plunger comprising a member positioned in front of the plate and having a face inclined to said path and constructed and arranged to force the margins of the sole in the vicinity of its heel-breast line across said path, and means for moving the knife past the distorted heel-seat portion of the sole.
to provide a reduced heel-seat portion and to form shoulders at opposite sides of the base of said reduced heel-seat portion.

76. A heel-seat fitting machine having, in combination, a matrix plate provided with a U-shaped opening, means to force the central part of the heel-seat portion of a sole positioned upon the plate through the opening, a heel-seat reducing cutter provided with a cutting edge movable in a predetermined path extending along and beyond a face of the plate, a member provided with a face and movable with said means constructed and arranged to force the lateral margins of the sole in the vicinity of its breast line across the path of movement of the cutter, and means to move the cutter in said path to reduce the heel-seat portion of the sole thereby to form a tongue and to form shoulders at opposite sides of the base of the tongue, said member being pivotally adjustable relatively to the plate and when in an operative position having one side of its face disposed in substantial alignment with said face of the matrix plate.

77. In a heel-seat fitting machine, a matrix plate, a cutter, a guide to constrain the cutter in a predetermined path, means for operating the cutter to form heel-breast receiving shoulders upon a sole supported by the plate, and an eccentric member to adjust the guide lengthwise of the plate for varying the path of movement of the cutter relatively to the plate.

78. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening, means to receive interchangeably one of a plurality of matrix plates having U-shaped openings of various sizes, knives for forming heel-breast receiving shoulders upon a sole supported by the plate, a guide constructed and arranged to constrain the knives in predetermined paths, mechanism for operating the knives to form said shoulders, and an eccentric member to adjust the guide lengthwise of the plate for varying the paths of movement of the respective knives.

79. In a heel-seat fitting machine having, in combination, a matrix plate, a guide provided with a slideway, and a cutter guided for movement along the slideway and past an edge of the plate to form heel-breast receiving shoulders upon a sole supported by the plate, said guide being eccentrically mounted for adjustment about an axis an extension of which passes substantially in the plane of said edge of the plate.

80. In a heel-seat fitting machine, a matrix plate, a cutter movable past an edge of the plate to form heel-breast receiving shoulders upon a sole positioned upon the plate, a cutter-operating slide, a guide provided with a slideway along which the slide is moved, an operating link connected to the slide for moving the same along the slideway, and an eccentric upon which the guide is mounted, said eccentric being adjustable about an axis an extension of which passes substantially through said edge of the plate and being constructed to swing the guide thereby to cause the cutter which is held against movement lengthwise of the slideway by the operating link to move forwardly or rearwardly of the plate without moving substantially heightwise of the plate.

81. A heel-seat fitting machine having, in combination, a matrix plate provided with breast edges, a cutter movable past said edges to form heel-breast receiving shoulders upon a sole supported by the plate, a guide provided with a slideway to constrain the cutter in a predetermined path, means to move the cutter along said path, a pin upon which the guide is mounted, means angularly to adjust the guide about the pin for varying the inclination of said path with respect to the plane of the sole, and means initially to adjust the pin for varying the position of said path lengthwise of the plate.

82. A heel-seat fitting machine having, in combination, a matrix plate provided with breast edges, knives movable past said edges to form heel-breast receiving shoulders upon a sole supported by the plate, a slide for operating the knives, a guide provided with a slideway to constrain the slide in a predetermined path, a slide-operating member, a pin upon which the guide is mounted, and means angularly to adjust the slideway about the pin, said pin being eccentrically mounted for adjustment to vary the position of said path of movement of the knives lengthwise of the plate.

83. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in making incisions in a sole attached to a shoe upper to form heel-breast receiving shoulders upon the sole, and reducing the heel-seat portion of the sole by a trimming cut which progresses forwardly of the sole to said incisions while utilizing the incisions to prevent forward movement of the sole during the heel-seat reducing operation.

84. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in making incisions in a sole attached to a shoe upper while the heel-seat portion of the sole is in substantially undistorted condition to form heel-breast receiving shoulders, distorting the heel-seat portion of the sole, and reducing the heel-seat portion of the sole by a trimming cut which progresses forwardly to the heel-breast receiving shoulders while utilizing the incisions to prevent movement of the sole during the heel-seat reducing operation.

85. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in causing a cutting tool to make incisions in a sole attached to a shoe upper to form heel-breast receiving shoulders thereon, distorting the heel-seat portion of the sole, and trimming the margin of the heel-seat portion of the sole progressively from the rear end of the sole to the incisions while said shoulder-forming cutting tool is positioned within the incisions thereby to support the sole against forward movement during the heel-seat reducing operation.

86. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in making a pair of incisions in a sole attached to a shoe upper by cutters to form heel-breast receiving shoulders upon the sole, retaining the cutters temporarily in said incisions, distorting the heel-seat portion of the sole, and trimming the margin of the heel-seat portion of the sole by a cutter which progresses forwardly of the sole to the incisions while the shoulder-forming cutters support the sole against movement under pressure of the heel-seat reducing cutter.

87. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in making a pair of incisions in a sole attached to a shoe upper by the use of cutters to form heel-breast receiving shoulders at opposite sides of the sole, retaining the cutters...
temporarily in the respective incisions after forming said shoulders, distorting the heel-seat portion of the sole, and trimming the margin of the heel-seat portion of the sole by the use of a cutter which moves progressively forwardly of the sole to the incisions while the shoulder-forming cutters remain in said incisions thereby to support the margin of the sole against movement under pressure of the heel-seat reducing cutter and to cause the shoulder-forming cutters to serve as anvils against which the heel-seat reducing cutter operates.

90. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in moving a pair of cutters through a sole attached to a shoe upper in paths disposed substantially at right angles to the plane of the sole thereby to make a pair of incisions in the sole, temporarily retaining the cutters in the incisions, distorting the heel-seat portion of the sole, and moving a drag knife forwardly of the sole to reduce the distorted heel-seat portion of the same while utilizing the cutters which engage within the incisions as anvils which hold the sole in position against the pressure of the heel-seat reducing cutter and against which the drag knife operates.

91. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in cutting progressively from opposite ends of the heel-breast line of a sole attached to a shoe upper toward the lengthwise median plane of the sole to make a pair of incisions in the sole thereby to form a pair of heel-breast receiving shoulders upon the sole, and reducing the heel-seat portion of the sole by a cut which progresses forwardly of the sole to said incisions while utilizing the incisions to support the sole against forward movement during the heel-seat reducing operation.

92. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in causing a pair of cutters to move from opposite ends of the heel-breast line of a sole toward the longitudinal median plane of the sole thereby to cut a pair of shoulder-forming incisions in the sole, temporarily retaining the cutters in the respective incisions at the end of the shoulder-forming cuts, distorting the heel-seat portion of the sole, and reducing the heel-seat portion of the sole by a cut progressing forwardly of the sole while the shoulder-forming cutters are positioned in said incisions and support the sole against displacement during the heel-seat reducing operation.

93. That improvement in methods of trimming the heel-seat portions of soles for the reception of heels which consists in moving a pair of oscillating cutters widthwise of a sole attached to a shoe upper to form a pair of heel-breast receiving shoulders, temporarily stopping the cutters at the end of the shoulder-forming strokes, distorting the heel-seat portion of the sole, and moving a cutter forwardly of the sole to reduce the heel-seat portion of the same while utilizing the shoulder-forming cutters as anvils against which the heel-seat reducing cutter operates.

94. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening, an operating member movable toward and away from the plate, a presser mounted for pivotal movement upon said operating member about an axis disposed at substantially right angles to the path of movement of said member and constructed and arranged to clamp the margin of the heel-seat portion of a sole against the plate, and a bulge secured to the operating member and constructed and arranged to force the heel-seat portion of the clamped sole through the opening.

95. In a heel-seat fitting machine, a matrix plate, a member constructed and arranged to press the margin of the heel-seat portion of a sole against the matrix plate, means including a bulge constructed and arranged for cooperation with the matrix plate to distort the heel-seat portion of the sole, said member comprising a plurality of parts at least one of which is movable under pressure relatively to the other parts, means for trimming the heel-seat portion of the sole to reduce the same, and means for forming heel-breast receiving shoulders upon the sole.

96. A heel-seat fitting machine having, in combination, a matrix plate, a presser member construct ed and arranged to clamp the margin of the heel-seat portion of a sole against the plate, means including a bulge constructed and arranged for cooperation with the matrix plate to distort the heel-seat portion of the sole, said presser member comprising a plurality of relatively movable parts pivotally mounted for movement as a unit relatively to the matrix plate in order effectively to clamp the margin of the heel-seat portion of the sole to reduce the same, and means for forming heel-breast receiving shoulders upon the sole.

97. In a heel-seat fitting machine, a matrix plate, and a U-shaped presser member made of resilient material and constructed and arranged to clamp the margin of the heel-seat portion of a sole against the matrix plate.

98. In a heel-seat fitting machine, a matrix plate provided with a U-shaped opening, a U-shaped presser member made of resilient material and shaped and arranged to clamp the margin of the heel-seat portion of a sole against the plate surrounding the opening, and rigid means for preventing substantial distortion of the U-shaped presser member during the sole-clamping operation.

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