

Sept. 7, 1937.

E. A. BESSOM

2,092,045

HEEL SEAT FITTING MACHINE

Filed Dec. 31, 1934

4 Sheets-Sheet 1

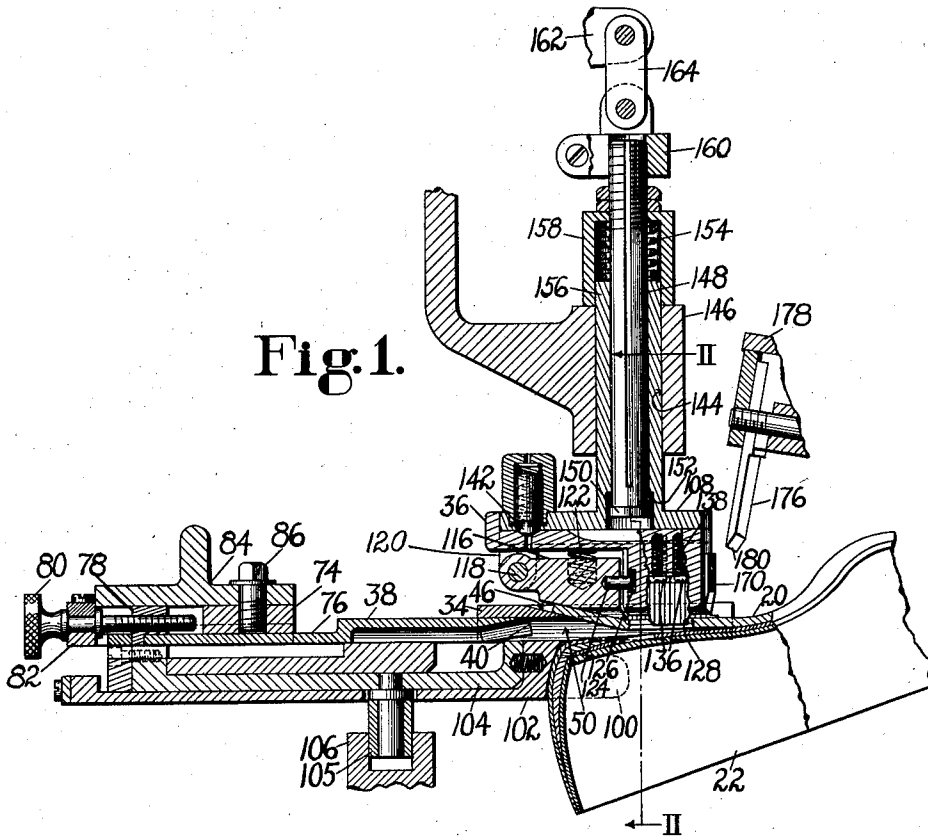


Fig. 1.

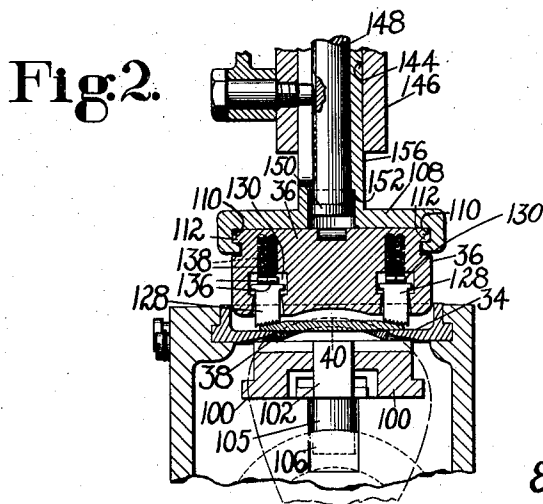


Fig. 2.

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4 Sheets-Sheet 2

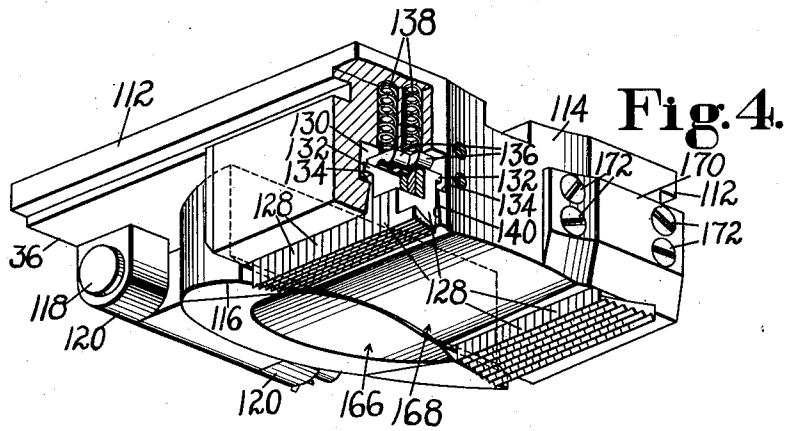


Fig. 4.

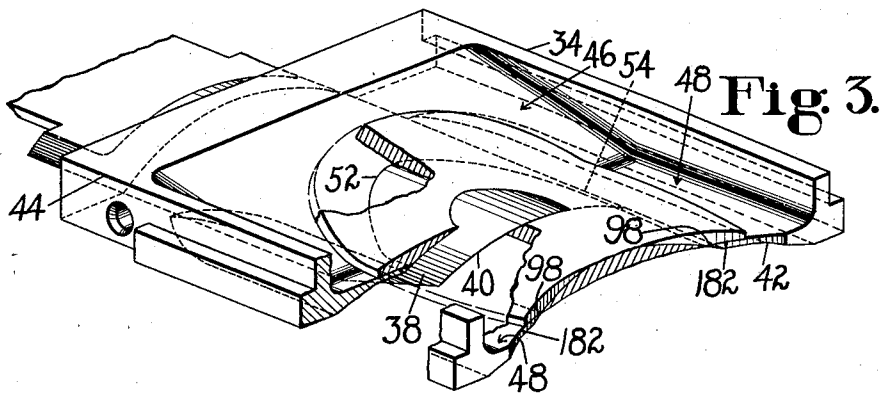


Fig. 3.

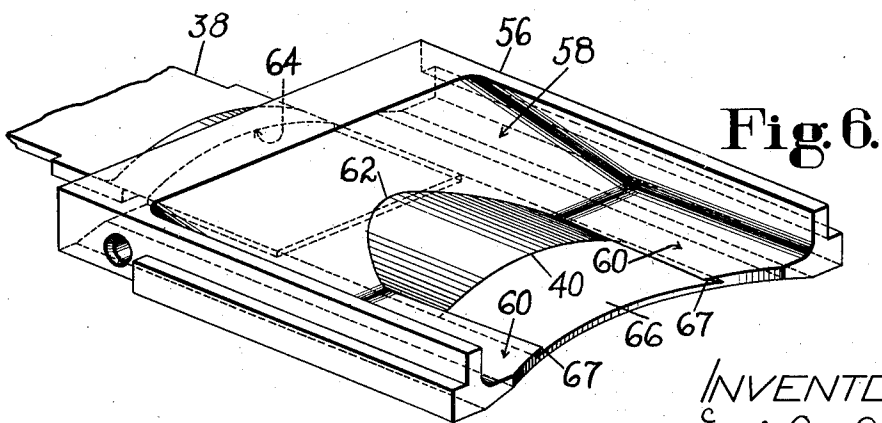


Fig. 6.

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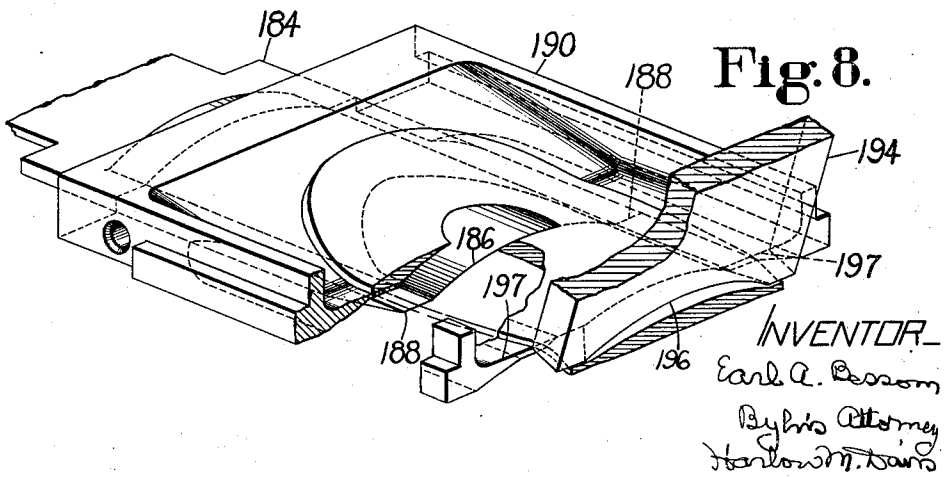
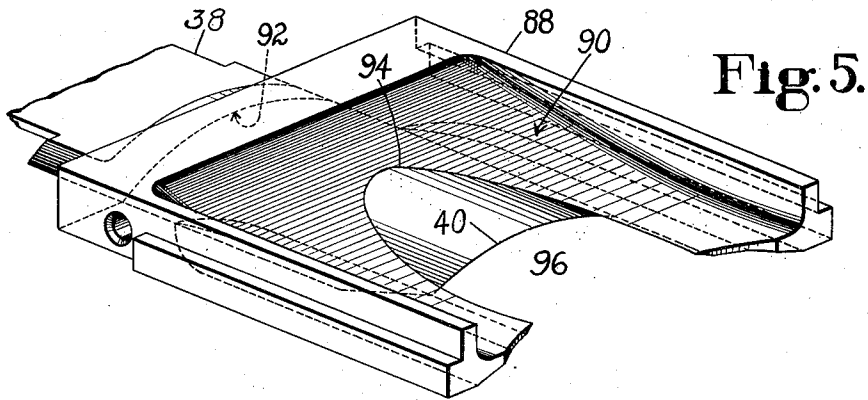
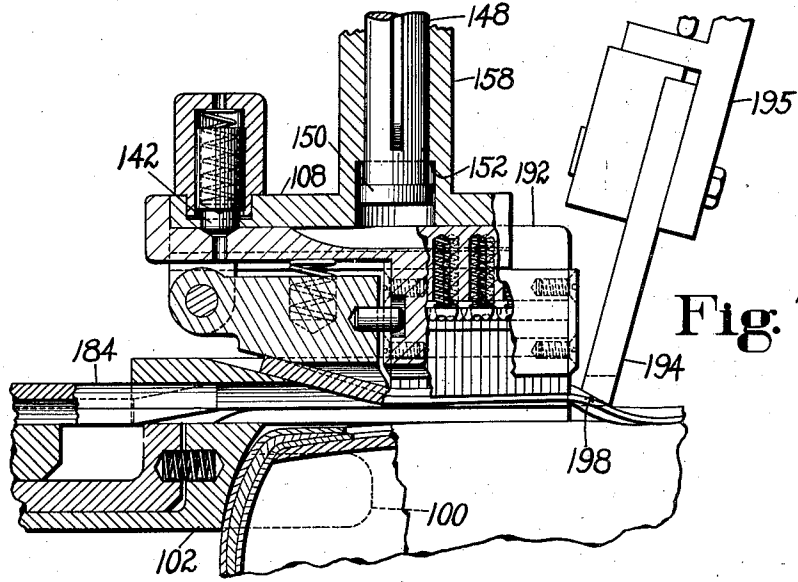
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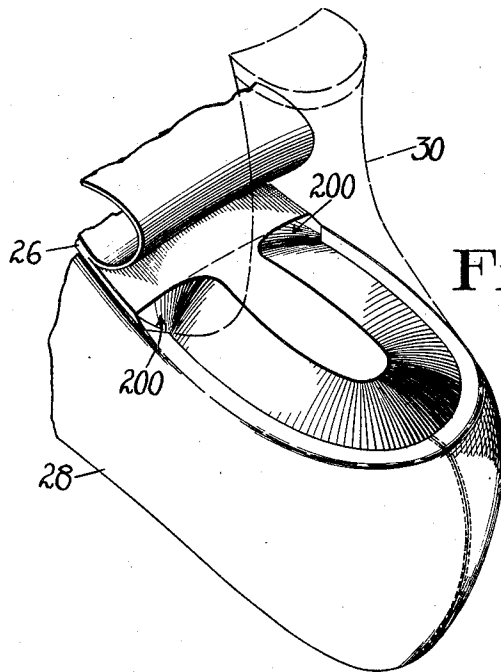


Fig. 10.

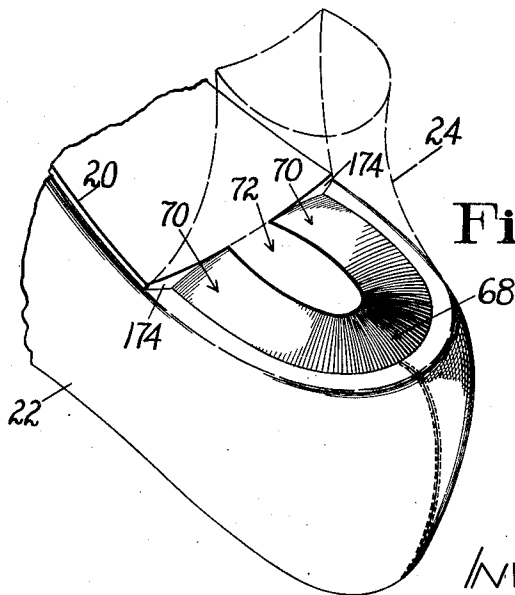


Fig. 9.

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UNITED STATES PATENT OFFICE

2,092,045

HEEL-SEAT FITTING MACHINE

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United Shoe Machinery Corporation, Paterson, N. J., a corporation of New Jersey

Application December 31, 1934, Serial No. 759,855

37 Claims. (Cl. 12—31.5)

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

In United States Letters Patent No. 1,980,371, granted November 13, 1934 on an application filed in my name, there is disclosed a machine which may be advantageously used to trim the heel-seat portions of soles attached to shoes in order to prepare the same for the reception of wood heels. In this machine the entire margin of the heel-seat portion of the sole is bent away from the plane of the central part of the heel-seat portion and is held clamped in such distorted condition while a reciprocating cutter movable forwardly of the sole and provided with a straight cutting edge trims the bent margins from the heel-seat portion of the sole thereby reducing and beveling the margin of the heel seat portion of the end. In order to insure that the sole attached to the shoe upper shall not be flexed forwardly of its heel-breast line thus tending, for example in compo work, to break the cement bond by which the sole is attached to the shoe upper forwardly of the heel-breast line, it is desirable that the forward part of the heel-seat portion of the sole shall remain substantially undistorted during the heel-seat fitting operation.

In accordance with one feature of this invention the illustrated machine is provided with a support for the heel-seat portion of a sole, a clamp for forcing the margin of the heel-seat portion of the sole against the support, the support and the clamp being constructed and arranged to maintain the forward end of the heel-seat portion of the sole substantially undistorted and to bend the rear end of the heel-seat portion at an angle with relation to the forward end, and mechanism for reducing the heel-seat portion of the sole lengthwise and widthwise while it is held between the support and the clamp.

The invention is illustrated as embodied in a heel-seat fitting machine which is of the general type disclosed in the above-mentioned United States Letters Patent No. 1,980,371. In the illustrated machine the heel-seat portion of the sole is supported upon a plate having a U-shaped opening and provided with thin forward parts which are spaced by the opening and enter the forward sides of the rand crease of the shoe without substantially distorting the sole. The plate is also provided with a relatively thick rear part, an upper sole-engaging face of which is arranged in oblique relation to sole-engaging faces of the forward part of the plate and inter-

sects a groove cut in the under side of the rear part of the plate to form the bight portion of the U-shaped opening, the bight portion of the opening being raised with reference to the sole-engaging faces of the front part of the plate.

In order to secure the heel-seat portion of the sole against movement under pressure of a heel-seat reducing cutter, which is mounted for reciprocation in a predetermined path, the margin of the heel-seat portion of the sole is forced by the above-mentioned clamp against the sole-engaging faces of the forward and the rear parts of the plate. To insure that the heel-seat portion of the sole shall have a heel-engaging face the transverse curvature of which is complementary to the transverse curvature of the attaching face of a heel to be attached to the shoe, the illustrated heel-seat reducing cutter is provided with a cutting edge which is arched transversely of its path of movement. As the heel-seat reducing cutter moves forwardly of the sole it travels along the groove formed in the under side of the rear part of the plate and passes through the bight portion of the U-shaped opening thus reducing the heel-seat portion of the sole lengthwise. As the cutter continues to move forwardly the lateral portions of its cutting edge travel along the respective sides of the U-shaped opening to reduce the heel-seat portion of the sole widthwise, the central part of the cutting edge extending above the sole and thus leaving the median portion thereof uncut. In order to form heel-breast receiving shoulders upon the sole the illustrated machine is provided with a pair of knives movable at right angles to the plane of the sole, the knives being operated either before or after the heel-seat reducing operation.

The invention is also illustrated as embodied in a machine equipped with a cutter which, during movement in a rectilinear path, reduces the heel-seat portion of the sole and forms heel-breast receiving shoulders upon the sole. The heel-seat reducing portion of the cutting edge of the cutter is identical with the heel-seat reducing portion of the cutting edge of the cutter above described but the cutter is provided with shoulder-forming extensions which, during a portion of the travel of the cutter, move along the under side of a sole-supporting plate adjacent to the sides respectively of a U-shaped opening formed in the plate. The sole-supporting plate terminates about one-fourth of an inch short of the heel-breast line of the sole, as distinguished from extending forwardly to such

heel-breast line, as does the sole-supporting plate above described. In order to bend the forward lateral parts of the heel-seat portion of the sole across the path of travel of the shoulder-forming extensions of the cutting edge of the cutter as it is moved forwardly to the heel-breast line of the sole, a presser plate similar to that illustrated in Figs. 26 and 27 of United States Letters Patent No. 1,980,371 is employed, the central part of the bottom face of the plate being provided with a groove of suitable shape to permit the arched heel-seat reducing portion of the cutting edge of the cutter to advance to the heel-breast line of the sole.

In order to insure that the clamp which is movable in a predetermined path shall effectively force heel-seat margins of non-uniform thickness against the sole-supporting plate and in accordance with a further feature of this invention, the illustrated clamp is provided with a plurality of sole-engaging plates each of which is constructed and arranged to yield generally lengthwise of and to tilt relatively to the path of movement of the clamp.

These and other features of the invention, including certain details of construction and combinations of parts, will be described as embodied in an illustrated machine and pointed out in the appended claims.

In the drawings,

Fig. 1 is a vertical section of a portion of the illustrated machine;

Fig. 2 shows a vertical section of the machine taken along line II—II of Fig. 1;

Fig. 3 is a perspective view partly in section showing the heel-seat reducing cutter and the sole-supporting plate of the illustrated machine;

Fig. 4 is a perspective view of a presser member for clamping the margin of the heel-seat portion of the sole against the sole-supporting plate during the heel-seat trimming operation;

Figs. 5 and 6 are views similar to Fig. 3 but illustrating modified types of sole-supporting plates which may be advantageously used in the machine;

Fig. 7 is an enlarged sectional view corresponding to Fig. 1 but illustrating the machine equipped to reduce the heel-seat portion of the sole and to form heel-breast receiving shoulders upon the same by the use of a single cutter;

Fig. 8 is a perspective view, partly in section, of a portion of the machine equipped as illustrated in Fig. 7;

Fig. 9 is a perspective view of the heel end of a shoe fitted for the reception of a Cuban heel by the machine illustrated in Figs. 1 to 4, inclusive; and

Fig. 10 is a perspective view of the heel end of a shoe fitted for the reception of a Louis heel by the machine equipped as illustrated in Figs. 7 and 8.

The illustrated construction may be readily incorporated in the machine disclosed in the above-mentioned United States Letters Patent No. 1,980,371 which may be referred to for a complete understanding of the construction and operation of the machine. The invention is described with reference to trimming the sole 20 (Fig. 9) of a shoe 22 for the reception of a Cuban heel 24 by the use of the machine equipped as illustrated in Figs. 1, 2, 3 and 4, and also with reference to trimming the sole 26 (Fig. 10) of a shoe 28 for the reception of a Louis heel 30 by the use of the machine equipped as illustrated in Figs. 7 and 8.

As above stated, it is desirable when trimming the heel-seat portions of soles of compo shoes for the reception of heels to retain the forward part of the heel-seat portion of the sole in undistorted condition. Accordingly, the illustrated machine is provided with a crease or sole-supporting plate 34 (Figs. 1, 2 and 3) and a presser member or clamp 36 (Figs. 1, 2 and 4) constructed and arranged to maintain the forward part of the heel-seat portion of the sole in undistorted condition and to bend the rear part of the heel-seat portion away from the shoe upper, the heel-seat portion of the sole being reduced by a heel-seat reducing or back cutter 38 which travels in a rectilinear path and has a cutting edge 40 which is arched transversely of such path. The crease plate 34 comprises a front part 42 (Fig. 3) which is relatively thin and is constructed and arranged to enter the rand crease of the shoe without substantially distorting the sole. The crease plate 34 also comprises a relatively thick rear part 44 provided with a sole-supporting face 46 which is inclined to sole-supporting faces 48 of the front part 42 and intersects a cylindrical groove 50 (Fig. 1) formed at the under side of the rear part 44 of the plate, thereby to provide a curved opening 52 which is continuous with an opening 54 formed in the forward part 42 of the crease plate. The openings 52 and 54 together form a U-shaped opening the bight portion of which consists of the opening 52 and is inclined to the opening 54. The bight portion of the U-shaped opening may, therefore, be said to be raised with respect to or above the sole-supporting surfaces 48 of the front part 42 of the crease plate. The sole-supporting faces 46 and 48 (Fig. 3) are positioned below a plane including the rear end of the face 46 and the forward end of the face 48 and may thus be said to form a sole-engaging surface which is concave in the direction of the thickness of the plate 34.

Although the crease plate 34 is illustrated as having the opening 54 this invention also contemplates a crease plate 56 such as illustrated in Fig. 6. The crease plate 56 comprises a rear sole-supporting face 58 and front sole-supporting faces 60 and is provided with an opening 62 formed by the intersection of the sole-supporting face 58 and a cylindrical groove 64 at the under side of the plate. The forward part of the crease plate 56 is not provided with an opening which extends through the plate but instead has a channel 66 formed therein, the lateral sides 67 of the channel being undercut and shaped for engagement with the lateral portions of the heel-seat reducing cutter 38.

As the cutter 38 moves forwardly of the sole supported by the crease plate 34 its arched cutting edge 40 moves along the cylindrical surface 50 which may be referred to as the tunnel portion of the plate. Upon continued forward movement of the cutter 38 the central part of the cutting edge 40 passes through the bight portion of the U-shaped opening in order to trim material from the end of the heel-seat portion of the sole thereby to form the beveled surface 68 (Fig. 9) and upon continued forward movement of the cutter its margins move along the respective side edges of the U-shaped opening to reduce the heel-seat portion of the sole widthwise by a pair of cuts which form the beveled surfaces 70. The cutting edge 40 is so constructed and arranged that it slides over the median part of the heel-seat portion of the sole and thus leaves an untrimmed plateau portion 72 at the central part of the re-

duced heel seat. The cutting edge 40 of the cutter 38 is arched in accordance with the transverse curvature of the attaching face of a heel to be secured to the shoe. The rear part of the clamped heel-seat portion of the sole is disposed at a slight angle to the path of movement of the cutter in order that the wide bevel 68 shall be formed at the rear end of the reduced heel seat, such bevel being of substantially the same width as beveled faces 70 formed along the sides of the reduced heel seat.

The heel-seat reducing cutter 38 is adjustably secured to a cutter carrier 74 (Fig. 1) which is guided along a rectilinear guideway (not shown) of the machine frame. The cutter carrier 74 is identical with the cutter carrier disclosed in United States Letters Patent No. 1,980,371, the shank portion 76 of the cutter being flat for reception within a dovetail groove (not shown) of the cutter carrier 74. The shank portion 76 of the cutter 38 is provided with a recess constructed and arranged to receive a block 78 which is in threaded relation with a screw 80 rotatably mounted in a bar 82 which is secured to the cutter carrier 74. The cutter carrier 74 is normally secured to a flange 84 of an operating slide (not shown) by a screw 86. The cutter 38 may be readily adjusted relatively to the cutter carrier 74 by turning the screw 80 and is then locked in adjusted position therewith by a set screw (not shown).

It will be understood that a crease plate 88 (Fig. 5) provided with a longitudinally curved or cylindrical face 90 may be substituted for the crease plate 34. The plate 88 at its under side is also provided with a cylindrical groove 92 the elements of which are disposed at substantially right angles to the elements of the cylindrical face 90, the cylindrical face 90 and the groove 92 intersecting to form a U-shaped opening 96 having a tight portion 94. The edge defining the U-shaped opening 96 is of tortuous shape. The cylindrical face 90 may be said to be concave in the direction of the thickness of the plate 88.

It will be noted that the forward ends of the sides of the U-shaped opening converge and are slightly raised. By providing such a construction the beveled surfaces 70 formed by the heel-seat reducing cutter 38 converge slightly at their forward ends. Such a construction insures that the forward end of the attaching face of the heel shall seat snugly against the counterportion of the shoe upper. The heel-seat portion of the sole of the shoe may be readily positioned widthwise and lengthwise upon the crease plate 34 by providing a centralizing fork 100 (Fig. 1) and a back gage 102 respectively, both these members being normally forced forwardly under spring pressure and being moved rearwardly under pressure of the shoe until the back gage 102 engages a stop 104. The stop 104 which carries a depending cam roll 105 may be moved into adjusted position lengthwise of the shoe by a cam 106 the position of which is controlled by a heel gage (not shown). The heel-gaging and shoe-positioning mechanism of the illustrated machine is identical with corresponding mechanism described in detail in United States Letters Patent No. 1,980,371 and will not be further described herein.

The clamp 36 is supported by a housing 108 (Fig. 1) provided with opposed grooves 110 (Fig. 2) shaped to receive flanges 112 respectively extending from a carrier or carrier block 114 (Fig. 3) of the clamp. As above stated the margin of the heel-seat portion of the sole is usually of non-

uniform thickness. In order, therefore, effectively to force the margin of the heel-seat portion of the sole against the crease plate 34, the clamp 36 comprises a plurality of heel-engaging parts which may be moved relatively to each other and which force substantially the entire margin of the heel-seat portion of the sole against the crease plate 34 even though the margin is of non-uniform thickness. The rear part of the margin of the heel-seat portion of the sole is forced against the inclined sole-supporting surface 34 by a pivotally mounted presser member 116 supported by a shaft 118 which is secured within a pair of bearing lugs 120 of the carrier block 114. The presser member 116 is normally forced into a lowered position with respect to the carrier block 114 by a spring 122 (Fig. 1), the downward movement of the presser member 116 when the clamp 36 is in a raised position being limited by a pin 124 secured to the presser member 116 and engaging within a slot 126 of the carrier block 116.

The side margins of the heel-seat portion of the sole are forced against the sole-supporting faces 48 of the crease plate 34 by a plurality of plates 128 which are arranged in parallel relation and are constructed and arranged to engage within recesses 130 (Fig. 4) formed in the carrier block 114. Each of the plates is provided with flanges 132 which overlap opposing ledges 134 respectively of the carrier block 114. The flanges 132 of the plates 128 are normally forced against the respective ledges 134 by equalizer bars 136 each of which is engaged by a spring 138 inserted within a recess in the carrier block 114. The equalizer bars 136 are arranged side by side, each of the bars being shaped for engagement with alternate plates 132 and being recessed at its middle portion to straddle an intermediate plate. Each of the recesses 130 has lower side walls 140 which flare, the arrangement being such that the plate 132 may tilt heightwise of the sole as they slide into and out of the recesses 130. It will thus be clear that the plates 132 effectively force heel-seat side margins of non-uniform thickness against the crease plate 34. In order further to insure that the entire margin of the heel-seat portion of the sole is forced against the crease plate 34 the carrier block 114 is mounted for swinging movement as a unit relatively to the housing 108. Such movement of the carrier block 114 is effected by flaring the slots 110 rearwardly from their respective forward ends, the flanges 112 of the carrier block, when the housing 108 is raised, being forced against the lower faces of the respective slots 110 by a spring-pressed plunger 142 (Fig. 1) which engages within a recess in the upper part of the carrier block 114.

The crease plate 34, the clamp 36 and the back or heel-seat reducing cutter 38 may be replaced, if desirable by corresponding members of various constructions in accordance with the shape to which it is desired to reduce the heel-seat portion of the sole.

The housing 108 (Fig. 1) is vertically reciprocated along a guideway 144 of a boss 146 of the main frame through a plunger rod 148, the housing being raised by engagement of a flange 150 located at the lower end of the plunger rod with a shoulder 152 of the housing. The housing 108 is forced downwardly against the sole through a spring 154 which engages the top end of an extension 156 of the housing and is enclosed within a casing 158 secured to the plunger rod 148. In order to reciprocate the rod 148 a collar 160 is secured to the upper end of the same, an operat-

ing lever 162 being connected to the collar 160 by a link 164.

As above stated, when the heel-seat portion of the sole is fitted for the reception of a heel by the use of the machine disclosed in United States Letters Patent No. 1,980,371 a bulger (not shown) is connected to the bottom of a rod corresponding to the rod 148, which bulger cooperates with a crease plate to distort the heel-seat portion of the sole widthwise and lengthwise. In order to equip the machine disclosed in the above patent as illustrated herein it is customary to remove the rod and the bulger which is secured thereto from the machine and to substitute the rod 148 therefor. The housing 168 is constructed and arranged to receive either sole clamps such as disclosed in United States Letters Patent No. 1,980,371 or the clamp 36 above described.

In order not to interfere with the cutting edge 49 which is curved transversely of its path of travel, as the cutter 38 is operated, the under side of the presser member 116 and the carrier block 114 are provided with grooves 166 (Fig. 4) and 168, respectively, arranged in close proximity to the path of travel of the cutting edge 38 when the clamp is in a lowered position. The presser plates 128 are positioned in each of the recesses 130 of the carrier block 114 by removing a cover 170 secured to the carrier block by screws 172, the cover 170 being replaced after the presser plates 128 have been inserted in the carrier block 114 in order to retain the plates in position.

In order to form heel-breast receiving shoulders 174 (Fig. 9) upon the sole and to sever the U-shaped chip trimmed from the heel-seat portion of the sole by the back cutter 38, the illustrated machine is provided with a pair of knives 176 (Fig. 1) which are adjustably secured to a holder 178, the cutting edges 180 of the knives being reciprocated past the forward edges 182 (Fig. 3) respectively of the crease plate 34. The construction and operation of the shoulder-forming knives 176 is described in detail in the above-mentioned United States Letters Patent No. 1,980,371 and need not be further described herein.

In order to perform the heel-seat fitting operation the operator forces the shoe rear end first against the centralizing fork 100 and the back gage 102 to position the heel-seat portion of the sole attached to the shoe upon the crease plate 34. After the heel-seat portion of the sole has been positioned the operator steps upon a treadle (not shown) to cause the clamp 36 to force the margin of the heel-seat portion of the sole against the crease plate 34. Further downward movement of the treadle sets the back cutter 38 in operation forwardly of the sole to reduce the heel-seat portion of the same and then moves the knives 176 downwardly to form heel-breast receiving shoulders 174 upon the sole and to sever the U-shaped chip cut by the back cutter 38 from the heel-seat portion of the sole, from the sole.

The heel-breast receiving shoulders 174 may be formed prior to reducing the heel-seat portion of the sole as disclosed in United States Letters Patent No. 1,980,371. When heel-breast receiving shoulders 174 are formed before the heel seat is reduced the knives 176 are temporarily stopped during forward movement of the heel-seat reducing cutter in order to hold the work against forward displacement by the heel-seat reducing cutter. When the heel-seat portion of the sole has been trimmed the operator releases

his foot from the treadle to permit the clamp 36 to be raised and then removes the shoe from the machine.

Figs. 7 and 8 illustrate a heel-seat fitting machine provided with a back cutter 184 which is movable in a rectilinear path and has a cutting edge the central heel-seat reducing portion 186 (Fig. 8) of which is curved transversely of its path of movement and shoulder-forming portions 188 of which are straight and engage the bottom face of a sole-supporting or crease plate 190 during a portion of the travel of the cutter. A crease plate 190 and a clamp 192 (Fig. 7) which is used to force the heel-seat portion of the sole against the plate 190, are practically identical with the crease plate 34 and the clamp 36, respectively, above described. The crease plate 190 and the clamp 192 extend to within about one quarter of an inch of the heel-breast line of the sole being operated upon and have planar forward faces for accommodating Louis work. The crease plate 34 and the clamp 36 above described are constructed and arranged to extend forwardly to the heel-breast line of the sole being operated upon and have forward faces which are curved inwardly in accordance with the transverse curvature of heel-breast receiving shoulders shaped to receive Cuban heels. It is unnecessary to describe in detail the parts of the crease plate 190 and the clamp 192 in view of the above description of the crease plate 34 and the clamp 36.

In order to bend the lateral parts of the heel-seat portion of the sole which extend forwardly of the crease plate 190 across the path of movement of the shoulder-forming edges 188 of the cutter 184, a presser plate 194 is adjustably secured to a holder 195 corresponding to the knife holder 178. The presser plate 194 is similar to a corresponding presser plate disclosed in United States Letters Patent No. 1,980,371 except for a central groove 196 which is formed in the bottom face of the presser plate 194 to accommodate the arched heel-seat reducing portion 186 of the cutting edge of the cutter 184. Spaced sole-engaging faces 198 (Fig. 7) of the presser plate 194 are inclined to the path of movement of the cutter 186 and cooperate with the front edges 197, respectively, of the crease plate 190 to bend the forward lateral margins of the heel-seat portion of the sole across the path of movement of the shoulder-forming edges 188 of the cutter 186. As the cutter moves forwardly to the front face of the presser plate 194 the straight cutting edges 188 of the cutter pass through the bent lateral portions of the sole to form heel-breast receiving shoulders 200. Mechanism for adjusting and operating the presser member 194 is not disclosed herein in view of the detailed description of the same in United States Letters Patent No. 1,980,371.

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

1. In a heel-seat fitting machine, a plate having an opening, said plate being provided with a concave sole-supporting face terminating in an edge which defines said opening, a substantial portion of said edge being constructed and arranged to extend above other portions of said edge.

2. In a heel-seat fitting machine, a member having a face constructed and arranged to be engaged by the heel-seat portion of a sole, said member being provided with an opening which extends into said face and has the general shape

of the letter U, the portion of the sole-engaging face adjacent to the closed end of the U being inclined to portions of the face which are located at opposite sides of the U.

3. In a heel-seat fitting machine, a sole-supporting member provided with a concave sole-engaging face and having an opening which extends along said face and a portion of which is arranged above portions of said sole-engaging face.
4. In a heel-seat fitting machine, a plate provided with a sole-supporting face, said plate having an opening which intersects the sole-supporting face and has the general form of a tunnel as viewed along a portion of said face.
5. In a heel-seat fitting machine, a plate having a sole-supporting face and provided with a U-shaped opening defined by an edge which lies in said face, the bight portion of said edge being arranged approximately in one plane and the side portions of said edge being arranged approximately in a plane inclined to the first-named plane.
6. In a heel-seat fitting machine, a plate having a U-shaped opening, said plate being provided with a concave sole-supporting face terminating in an edge which defines said opening, the portion of said edge which defines the bight portion of the opening being constructed and arranged to extend above side portions of said edge.
7. In a heel-seat fitting machine, a plate one side of which is provided with a concave cylindrical sole-supporting face and the other side of which is provided with a concave cylindrical face the elements of which are disposed at substantially right angles to the elements of the first-named face, the second-named face being arranged to intersect the first-named face and to form a U-shaped opening therewith.
8. In a heel-seat fitting machine, a sole-supporting member one side of which is provided with a pair of faces inclined to each other and the other side of which is provided with a concave face arranged to intersect at least one of the first-named faces and to form a U-shaped opening therewith.
9. In a heel-seat fitting machine, a member one side of which is provided with a concave face constructed and arranged to support the heel-seat portion of the sole of a shoe, the opposite side of said member being provided with an elongated groove which intersects said concave face and forms therewith a U-shaped opening defined by an edge lying in said face.
10. In a heel-seat fitting machine, a crease plate constructed and arranged to be positioned between a sole and upper of a shoe, one side of said plate being provided with sole-engaging faces which are inclined to each other and the other side of the plate being provided with a concave face which intersects the sole-engaging faces and forms a U-shaped opening therewith.
11. In a heel-seat fitting machine, a crease plate comprising front and rear portions having sole-supporting faces respectively which are inclined to each other, said rear portion being provided with an opening which has the general form of a tunnel.
12. In a heel-seat fitting machine, a plate comprising a rear portion having a U-shaped opening and a sole-engaging face, said plate also comprising a forward portion having a channel which is continuous with said opening and having a pair of sole-engaging faces spaced by the channel and inclined to the sole-supporting face of said rear portion of the plate.
13. In a heel-seat fitting machine, a crease plate provided with a U-shaped opening, a channel which is continuous with the opening, and a concave sole-supporting face surrounding the opening and the channel.
14. In a heel-seat fitting machine, a plate having a U-shaped opening, said plate being provided with a channel which is substantially continuous with the opening and having a concave sole-supporting face surrounding the opening and the channel, and a cutter movable in a predetermined path extending through the opening and along the channel, said cutter being provided with a cutting edge which is arched transversely of its path of movement.
15. In a heel-seat fitting machine, a support for the heel-seat portion of a sole, a clamp for forcing the margin of the heel-seat portion of the sole against the support, said support and said clamp being constructed and arranged to maintain the forward end of the heel-seat portion of the sole substantially undistorted and to bend the rear end of said heel-seat portion of the sole at an angle with relation to said forward end, and means for reducing the heel-seat portion of the sole lengthwise and widthwise while it is held between the support and the clamp.
16. A heel-seat fitting machine having, in combination, a plate for supporting the heel-seat portion of a sole, means for clamping said heel-seat portion against the plate, and a cutter movable in a predetermined path lengthwise of the sole, said cutter having a cutting edge which is arched transversely of said path and is formed and arranged to reduce the heel-seat portion of the sole lengthwise and widthwise by a beveling cut.
17. A heel-seat fitting machine having, in combination, means constructed and arranged to maintain the forward part of the heel-seat portion of a sole substantially undistorted and to bend the rear part of said heel-seat portion relatively to said forward part, and a cutter movable in a path extending lengthwise of the sole and having a cutting edge which is curved transversely of said path, said cutter being constructed and arranged to reduce said heel-seat portion lengthwise and widthwise by a beveling cut.
18. A heel-seat fitting machine having, in combination, a member for supporting the heel-seat portion of a sole, said member being provided with an opening over which the heel-seat portion of the sole is positioned, a clamp for forcing the margin of said heel-seat portion against said member, a knife movable in a predetermined path and having a cutting edge which is arched transversely of said path, and means for operating the knife in said path, said member and said clamp being constructed and arranged to bend the rear part of the heel-seat portion of the sole across the path of movement of the cutter and to cause only the lateral portions of the forward part of said heel-seat portion to be disposed across said path thereby to reduce said heel-seat portion lengthwise and widthwise as the knife is operated.
19. In a heel-seat fitting machine, a blade movable in a predetermined path, said blade having a cutting edge which is arched transversely of said path, and a plate provided with an opening constructed and arranged to receive said blade, said plate having a sole-supporting face which surrounds the opening and portions of which are arranged in oblique relation to the path of movement of the blade.

20. In a heel-seat fitting machine, a sole-supporting plate having an opening and provided with a face formed and arranged to support the heel-seat portion of a sole, a heel-seat reducing cutter movable in a predetermined path extending through one portion of the opening and along another portion of the same, said cutter having a cutting edge which is arched transversely of said path, and mechanism for operating the cutter.

21. A heel-seat fitting machine having, in combination, a plate having a U-shaped opening and provided with a concave sole-engaging face, mechanism for clamping substantially the entire margin of the heel-seat portion of a sole positioned over the opening against the sole-engaging face, an arched cutting blade, and means for moving the blade in a path extending through and generally lengthwise of the U-shaped opening to reduce the heel-seat portion of the sole lengthwise and widthwise.

22. In a heel-seat fitting machine, a knife mounted for movement in a fixed path and provided with a cutting edge which is arched transversely of said path, and a plate having sole-supporting face portions which are arranged in oblique relation to said path, the sole-supporting portions of the plate having an opening through which a portion of the cutting edge passes as it moves in said path.

23. A heel-seat fitting machine having, in combination, means constructed and arranged to clamp the forward part of the heel-seat portion of a sole attached to a shoe upper in substantially undistorted condition and to bend the rear part of said heel-seat portion away from the shoe upper, a cutter mounted for movement in a predetermined path extending from one side to the other of the rear bent part of the heel-seat portion to reduce said heel-seat portion lengthwise and along the lateral margins of the forward part of the heel-seat portion to reduce the same widthwise, and means for operating the cutter.

24. A heel-seat fitting machine having, in combination, a sole-supporting member comprising a front part having a sole-engaging face and a rear part having a tunnel portion and a sole-engaging face which is inclined to and merges with said first-named face, means for forcing the sole against said faces, a crowned cutting blade movable in a predetermined path which extends along said tunnel portion and is inclined to said second-named sole-engaging face, and means for operating the blade in said path to reduce the heel-seat portion of the sole lengthwise and widthwise.

25. A heel-seat fitting machine having, in combination, a plate having a concave cylindrical surface and provided with a sole-engaging face which is arranged in oblique relation to elements of said cylindrical surface and intersects the same to form a U-shaped opening, means for forcing the margin of the heel-seat portion of a sole against said sole-engaging face, a knife mounted for movement in a predetermined path and having a cutting edge which is arched transversely of said path, and means for moving said knife along said cylindrical surface and through the U-shaped opening to reduce the heel-seat portion of the sole.

26. In a heel-seat fitting machine, a knife mounted for movement in a predetermined path and provided with a cutting edge which is arched transversely of said path, means for operating the knife, and a sole-supporting member having a U-shaped opening arranged in substantial

alignment with said path and provided with a sole-engaging face arranged adjacent to the opening, a portion of said face being arranged in oblique relation to said path and another portion of said face being arranged approximately in parallel relation to said path.

27. In a heel-seat fitting machine, a plate provided with a face constructed and arranged to support the heel-seat portion of a sole, means for clamping said heel-seat portion against the plate, and a heel-seat reducing cutter movable lengthwise of the plate in a predetermined path, said plate being provided with a cutting edge the central portion of which is arched transversely of said path and the end portions of which are relatively straight and extend generally transversely of said path.

28. In a heel-seat fitting machine, a plate provided with a face constructed and arranged to support the heel-seat portion of a sole, a clamp for forcing the margin of the heel-seat portion of the sole against the plate, and a heel-seat reducing cutter movable lengthwise of the sole in a predetermined path, said cutter being provided with a cutting edge the central part of which is arched transversely of said path and projects above a portion of the sole-supporting face during a portion of its travel, the margins of said cutting edge being relatively straight and arranged below said face during a portion of the travel of the cutter in said path.

29. In a heel-seat fitting machine, a plate provided with a face constructed and arranged to support the heel-seat portion of a sole, means for clamping said heel-seat portion against the plate, and a heel-seat reducing cutter movable lengthwise of the sole in a predetermined path, said cutter being provided with a cutting edge which is arched transversely of said path and is constructed and arranged to reduce the heel-seat portion of the sole lengthwise and widthwise, the margins of the cutting edge being relatively straight and constructed and arranged during movement in said path to form heel-breast receiving shoulders upon the sole.

30. In a heel-seat fitting machine, a sole-supporting plate provided with an opening, and a cutter movable in a predetermined path and having a substantially continuous cutting edge the central portion of which extends beyond one side of the plate and the marginal portions of which extend beyond the other side of the plate during a portion of the travel of the cutter in said path.

31. In a heel-seat fitting machine, means for clamping the heel-seat portion of a sole, and a cutter for reducing the heel-seat portion of the sole for the reception of a heel, said cutter being movable in a predetermined path and having a cutting edge the central part of which is arched transversely of its path of travel and the margins of which are angularly disposed relatively to said central part.

32. In a heel-seat fitting machine, a plate having an opening, said plate having an under face and also having an upper face which is constructed and arranged to be engaged by the heel-seat portion of a sole, means for clamping the margin of the heel-seat portion of the sole against said upper face, a heel-seat reducing cutter movable in a predetermined path, said cutter having a cutting edge a central portion of which is arched transversely of its path of movement and projects beyond the sole-engaging face of the plate and the lateral portions of which are substantially straight and move along the under face

of the plate, and a presser member constructed and arranged to force the forward lateral portions of the heel-seat portion of the sole across the path of movement of the lateral portions of the cutting edge of the cutter.

33. In a heel-seat fitting machine, a support for the heel-seat portion of a sole, a clamp for forcing the margin of said heel-seat portion against the support, and means for moving the clamp in a predetermined path, said clamp comprising a plurality of sole-engaging plates each of which is constructed and arranged to yield generally lengthwise of said path and to tilt relatively to said path thereby effectively to clamp the heel-seat margins of soles of non-uniform thickness against the support.

34. In a heel-seat fitting machine, a support for the heel-seat portion of a sole, and a clamp movable in a predetermined path relatively to the support, said clamp comprising a carrier, a plurality of plates mounted in the carrier and projecting beyond the same, and resilient means for urging the plate a predetermined distance beyond the carrier when the clamp is moved away from the sole, each of said plates being mounted for translatory and tilting movement heightwise of the sole relatively to the carrier against the pressure of said resilient means as the clamp is forced against the sole thereby effectively to secure heel-seat margins of non-uniform thickness against the support.

35. In a heel-seat fitting machine, a support for the heel-seat portion of a sole, and a clamp for forcing the margin of said heel-seat portion

against the support, said clamp comprising a carrier, a plurality of plates supported by the carrier, said plates being arranged in parallel arrangement and mounted for sliding movement relatively to each other, and a plurality of spring-operated equalizer bars positioned between the carrier and the plates, each of the bars being constructed and arranged to engage alternate plates and to straddle an intermediate plate.

36. In a heel-seat fitting machine, a support for the heel-seat portion of a sole, and a clamp for forcing the margin of said heel-seat portion against the support, said clamp comprising a carrier, a plurality of plates mounted in the carrier, and resilient means for urging the plates a predetermined distance beyond the carrier when the clamp is moved away from the sole, said plates and said carrier being constructed and arranged to cause the plates when forced against the heel-seat portion of the sole supported by the plate to orient themselves heightwise of the heel-seat portion of the sole in order to insure that heel-seat margins of non-uniform thickness shall be effectively clamped.

37. In a heel-seat fitting machine, a support for the heel-seat portion of a sole, and a clamp for forcing the margin of said heel-seat portion against the support, said clamp having an elongated groove and provided with sole-engaging portions which are positioned at opposite sides respectively of said groove and comprise a plurality of relatively movable parts.

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