July 6, 1943. L. G. MILLER ET AL 2,323,407

HEEL-SEAT FITTING MACHINE

Filed Aug. 20, 1942

Fig.1

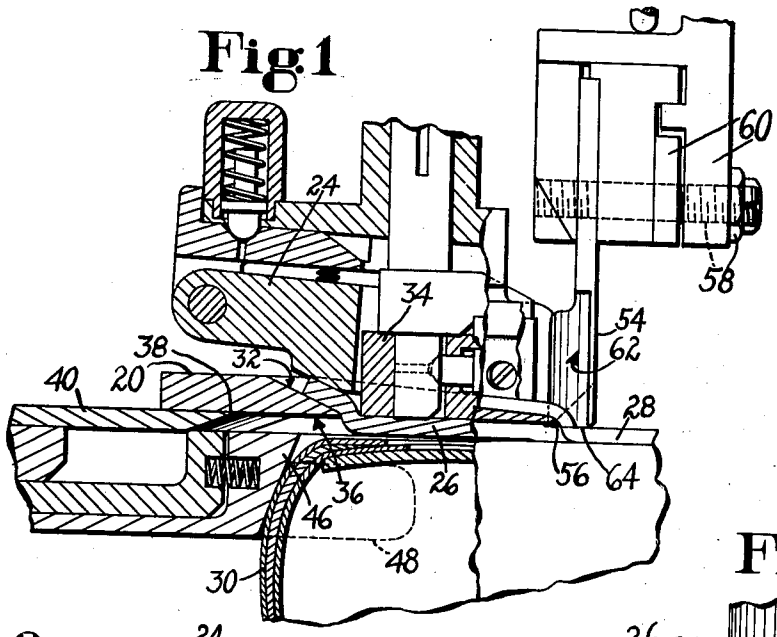


Fig.2

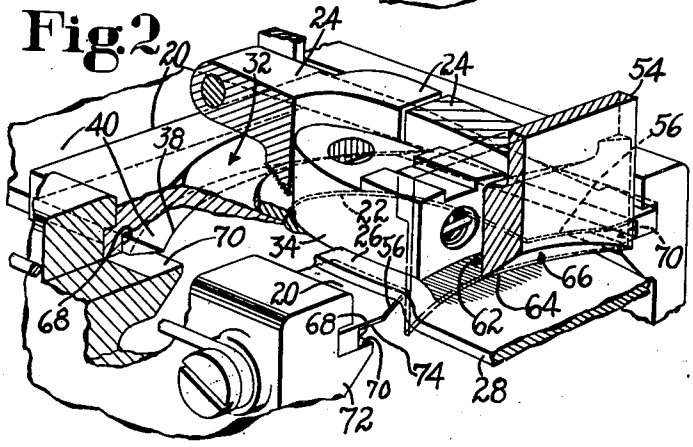


Fig.3

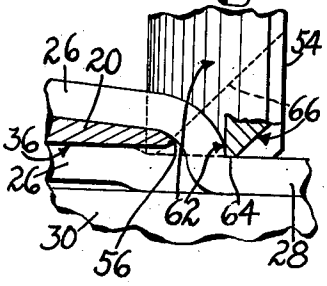


Fig.4

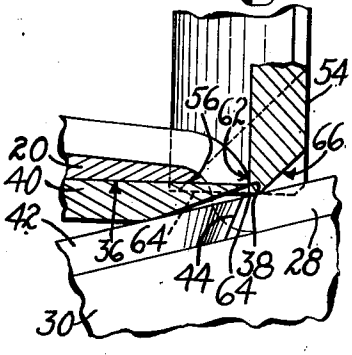
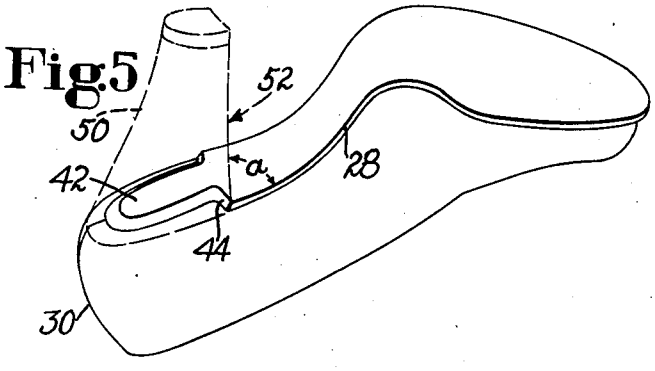


Fig.5



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HEEL-SEAT FITTING MACHINE

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Application August 20, 1942, Serial No. 455,444

10 Claims. (Cl. 12—31.5)

This invention relates to shoe machinery and is illustrated as embodied in a heel-seat fitting machine.

It is an object of the present invention to provide an improved heel-seat fitting machine of the general type disclosed in United States Letters Patent No. 1,980,371, granted November 13, 1934, on an application filed in the name of Earl A. Bessom.

The illustrative machine comprises a depressor for forcing the heel-breast line portion of an attached sole of a shoe below the horizontal path of movement of a combined tab and heel-breast receiving shoulder forming knife. Instead, however, of having the knife move forwardly past a non-cutting depressor as in the machine illustrated in Figs. 26 and 27 of said Letters Patent, for example, the illustrative knife at the forward end of its stroke engages an anvil face of a depressor, which face is disposed at approximately right angles to the path of movement of the knife and is previously moved into a lowered rest position across the forward end of said path. In order to insure that the forward cutting end of the tab and heel-breast receiving shoulder forming knife shall not be deflected away from the crease plate and/or from the depressor during the heel-seat fitting operation, the knife itself is positively constrained for movement in guideways formed between the frame of the machine and a crease plate which is secured to the frame.

With the above-mentioned improvements the angle at which the heel-breast receiving shoulders are disposed longitudinally to the plane of of the sole can be accurately controlled, this being of considerable importance since the shoulders should be complemental to opposing portions of the breast of a Cuban heel, for example, which is to be attached to the shoe, and in the finished shoe should be effectively held down against the overlasted counter portion of the shoe by the heel. Moreover, with the above construction the exact longitudinal positions of the shoulders formed on the sole can be accurately controlled, since the knife has little, if any, tendency to draw the sole away from the crease plate and from the depressor, the shoulder forming cut terminating at the anvil face of the depressor.

The various features of the invention will be understood and appreciated from the following detailed description read in connection with the accompanying drawing, in which

Fig. 1 shows in side elevation portions of the head of the illustrative machine, partly in section, in the process of operating upon a shoe;

Fig. 2 is a perspective view, partly broken away and partly in section, of the portion of the machine illustrated in Fig. 1;

Fig. 3 is an enlarged longitudinal section, showing in detail the heel-breast line portion of the sole of the shoe after it has been deformed in the machine preparatory to trimming the sole;

Fig. 4 is a view similar to Fig. 3 but showing the sole immediately after the tab and shoulder forming knife of the machine has completed its forward trimming stroke; and

Fig. 5 is a perspective view of the heel-end portion of the shoe which has been operated upon by the machine.

The illustrative machine, with the exception of certain portions which will be specifically described, is identical with the machine disclosed in the above-mentioned Letters Patent No. 1,980,371 and comprises a matrix or crease plate **20** having a U-shaped opening **22** (Fig. 2), a clamp **24** (Figs. 1 and 2) for forcing the margin of the heel-seat portion **26** of an attached sole **28** of a shoe **30** (Figs. 1 and 5) against a beveled face **32** of the crease plate, and a bulger **34** for forcing the central part of the clamped heel-seat portion of the sole through the U-shaped opening **22** and below a flat lower face **36** (Figs. 1, 3 and 4) of the crease plate.

Movable forward and rearward with its cutting edge **38** in engagement with the flat lower surface **36** of the crease plate **20** is a knife **40** for forming, after the heel-seat portion of the sole has been suitably deformed as will appear later, a heel-seat tab **42** (Fig. 5) and heel-breast receiving shoulders **44** upon the sole of the shoe.

The shoe is positioned lengthwise in the machine by a back gage **46** (Fig. 1) and widthwise by a centralizing gage **48**, the positions of these gages being readily determined by mechanism (not shown) which is operatively connected to a heel measuring gage (not shown). The construction and operation of the shoe positioning and heel measuring mechanism is fully disclosed in said Letters Patent No. 1,980,371 and need not be described further herein.

It is desirable that the heel-breast receiving shoulders **44** formed upon the attached sole **28** of the shoe **30** shall be complemental to the upper end of the breast of a Cuban heel **50**, for example, which is to be attached to the shoe. Since the breast **52** of the heel **50** is usually inclined to the lengthwise dimension of the shoe, as indicated by angle a, it is desirable that the heel-breast receiving shoulders **44** shall taper rearwardly to a slight extent as they approach

the overlasted counter portions of the shoe upper. Such a bevel is desirable since the heel should hold the lateral margins of the rear end of the shank portion of the sole securely against said overlasted counter portions, thereby retaining said lateral margins against their common tendency to curl away from the shoe upper after the shoe has been worn for a short time.

It is quite important that the angle of rearward bevel of the heel-breast receiving shoulders be accurately determined since, if the bevel is too gradual, the heel will ride up on the shoulders, with the result that in the finished shoe the forward ends of the rim of the attaching face of the heel cannot be forced into snug relation with the overlasted counter portion of the shoe upper. When the rearward bevel of the heel-breast receiving shoulders is somewhat steeper than the angle of the heel breast, a tight heel-breast joint is not formed between the heel-breast receiving shoulders and the upper end of the breast of the heel, with the result that the heel does not effectively support the lateral margins of the rear end of the shank portion of the sole against the above-mentioned tendency to curl away from the shoe upper. It will therefore be clear that in addition to locating the heel-breast receiving shoulders accurately lengthwise of the sole, it is desirable that said shoulders shall be of a predetermined rearward bevel.

In order accurately to control the lengthwise location as well as the lengthwise bevel of the heel-breast receiving shoulders **44**, there is provided a depressor or sole engaging plate **54** which is vertically movable at approximately right angles to the crease plate **20** in a path arranged a slight distance ahead of the front edge **56** of the crease plate. The depressor **54** is secured through the provision of a screw and nut **58** (Fig. 1) to a carrier **60** adjustably secured to a slide (not shown) movable in a guideway (not shown) formed in a plate (not shown) of the machine. As clearly disclosed in said Letters Patent No. 1,980,371, the above-mentioned plate in which the guideway is formed may be swung about an axis to vary within limits the angle of travel of the depressor toward and away from the sole. Moreover, as disclosed in said Letters Patent, the carrier guideway may be bodily moved slightly lengthwise of the crease plate **20** to vary the space between the depressor and the forward end of the crease plate in accordance with the thickness of the sole being operated upon.

A rear face **62** of the depressor **54** is cylindrical and terminates at its lower end in a sole-engaging, non-cutting ridge **64**, the portion of the depressor immediately forward of the ridge, for the purpose of clearance, being cut away to form a beveled face **66**. The lower end of the depressor **54** may thus be defined as being wedge shaped and as having wedge faces **62, 66**.

After the heel-seat portion of the sole has been distorted by the action of the crease plate **20**, the clamp **24**, and the bulger **34**, the depressor is lowered into a position in which the ridge **64** of the depressor extends slightly below the general plane of the flat lower face **36** of the crease plate **20**. The rear face **62** of the depressor at such time extends across the forward end of the path of travel of the knife **40** and during the operation of the machine serves as an anvil against which the knife cuts.

After the heel-seat portion **26** of the sole **28** has been deformed to the shape shown in Figs. 1, 2 and 3 by the combined action of the crease plate **20**, the clamp **24**, and the bulger **34**, and the depressor **54** has forced the lateral breast line portions of the sole which are located immediately ahead of the crease plate across the path of travel of the knife, the knife is moved forwardly to form the heel seat tab **42** and the heel-breast receiving shoulders **44**. After the knife **40** has passed through the central part of the heel-seat portion **26** of the sole which has been forced down through the U-shaped opening **22**, it travels forwardly of the crease plate and through the bent-down and longitudinally tensioned lateral margins of the breast line portion of the sole and after engaging the anvil face of the depressor, which is stationary at this time, moves back to its retracted position.

The knife **40**, as is the corresponding knife shown in Figs. 26 and 27 of said Letters Patent No. 1,980,371, is secured to a carrier (not shown) which, in turn, is connected to a slide (not shown) movable in forwardly and rearwardly extending guideways (not shown) of the machine frame. It has been found that when the knife **40** is not individually and positively guided it has a tendency to flex and accordingly to dip slightly during its forward movement through the work, with the resultant loss of control of the cut. With the above considerations in view, the lateral margins of the knife **40**, which is wider than the corresponding knife shown in said Letters Patent, fit in guideways **68** (Fig. 2) respectively formed by ledges **70** of a crease plate support **72** and by the lateral portions of a recess **74** formed at the underside of the crease plate. With the above construction the knife **40** is held against the above-mentioned tendency to dip under pressure of the work, and its cutting edge **38** at all times remains in the same path of travel irrespective of the thickness and/or the temper of the sole.

It has been found that by more accurately controlling the path of movement of the knife **40** and by causing the depressor **54** to act as an anvil as above described, the positions of the heel-breast receiving shoulders **44** as well as the degree of rearward bevel of said shoulders can be accurately controlled.

Although the illustrative machine is described with reference to operating on Cuban work, it will be appreciated that when operating on Louis work differently shaped parts may be substituted for corresponding operative parts of the machine in accordance with common practice in heel-seat fitting machines.

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

1. A heel-seat fitting machine having, in combination, means comprising a crease plate constructed and arranged to deform the central part of the heel-seat portion of an attached sole of a shoe relatively to the margin of said heel-seat portion, a knife movable forwardly in a predetermined path along said crease plate to reduce the heel-seat portion of the sole, and a depressor constructed and arranged to force the lateral margins of the heel-breast line portion across the path of movement of the knife whereby to cause the knife during its forward movement to form heel-breast receiving shoulders on the sole, said depressor being movable across the path of movement of the knife and having a face serving as an anvil against which the knife cuts at the forward end of its stroke.

2. A heel-seat fitting machine having, in com-

bination, a knife movable in a predetermined path, means comprising a crease plate and a depressor for causing the lateral margins but not the central part of the heel-breast line portion of the sole to be tensioned lengthwise across the path of movement of the knife, said depressor being wedge shaped and having one of its wedge faces constituting an anvil face, and means for operating the depressor until its anvil face is moved across the forward end of the path of movement of the knife, in which position said face is contacted by the knife at the forward end of its stroke.

3. A heel-seat fitting machine having, in combination, sole deforming means comprising a matrix plate having a U-shaped opening, a knife movable along said plate to form a heel-seat tab and heel-breast receiving shoulders upon the sole. a wedge-shaped depressor having an anvil face which is arranged at a steep angle to the path of movement of the knife, means for moving the depressor into a position in which its anvil face is arranged to be engaged by the knife at the forward end of its path of travel, and means for operating the knife.

4. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, means for forcing the central part of the heel-seat portion of the sole supported upon the plate through said opening and beyond a face of the plate, a knife movable in a predetermined path extending along and beyond the forward edge of said face of the plate, a non-cutting depressor for forcing lateral sole margins which are located forwardly of the plate across the path of movement of the knife, and means for moving the depressor a substantial distance below the path of movement of the knife and for causing it temporarily to remain stationary, said depressor having a face disposed at a steep angle to the path of movement of the knife and serving as an anvil against which the knife cuts at the forward end of its stroke.

5. A heel-seat fitting machine having, in combination, a matrix plate provided with an opening, a bulger to force the central part of the heel-seat portion of a sole through the opening and beyond a face of said plate, a knife having a cutting edge movable in a predetermined path extending along and beyond the forward edge of said face, a non-cutting depressor having a sole engaging rib and an anvil face, said depressor being movable thicknesswise of the sole in a path arranged forwardly of and spaced a substantial distance from said matrix plate into an operative position in which said anvil face extends across the forward end of the path of movement of the knife, and means for operating the depressor in such timed relation to the knife that the anvil face of the depressor is engaged by the knife at the forward end of its stroke.

6. A heel-seat fitting machine having, in combination, a matrix plate having an opening, means to force the central part of the heel-seat portion of a sole positioned upon the plate through the opening, a knife movable in a predetermined path extending lengthwise along and beyond the forward edge of the plate, a presser member movable to a position across the forward end of the path of movement of the knife and constructed and arranged to serve as an anvil against which the knife operates, said presser member being initially adjustable lengthwise of the plate to vary the distance between the presser member and the forward edge of said plate, and means for moving the knife in said path to reduce the heel-seat portion of the sole and to form upon the sole heel-breast receiving shoulders which are beveled lengthwise of the sole.

7. In a heel-seat fitting machine, a support, a crease plate mounted upon and secured to the support, a knife, guideways which are formed between the support and the plate and extend lengthwise of said plate, said guideways being constructed and arranged positively to control the path of movement of the knife, and means for moving the knife in said path.

8. In a heel-seat fitting machine, a support, a crease plate secured to the support, said crease plate having an opening and a flat face, means for forcing the central part of the heel-seat portion of the sole of a shoe through the opening and beyond said face, a tab-forming knife, and guideways which are formed by the support and the crease plate and which are arranged at opposite sides of said opening and extend to the forward end of said plate.

9. In a heel-seat fitting machine, a support, a crease plate secured to the support, said crease plate having an opening and a flat face, means for forcing the central part of the heel-seat portion of a shoe through the opening and beyond said face, a tab-forming knife having a cutting edge which is in engagement with the flat face of the plate, and guideways which are formed by the support and the crease plate and are constructed and arranged to insure that the knife during its tab-forming stroke shall not be moved away from the plate by pressure of the sole.

10. In a heel-seat fitting machine, a crease plate having a U shaped opening and a flat lower face, a support bridged by the plate, and a heel-seat reducing knife, said support comprising ledges which are spaced from opposite lateral portions of the lower face of the plate and form therewith guideways constructed and arranged to control movement of the knife lengthwise of the plate and to insure that the cutting edge of the knife is not displaced away from the plate by pressure of the work during the heel-seat reducing stroke of the knife.

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