March 10, 1942. M. L. DODGE 2,276,029

SHOE UPPER SHAPING MACHINE

Filed Aug. 19, 1939 3 Sheets-Sheet 1

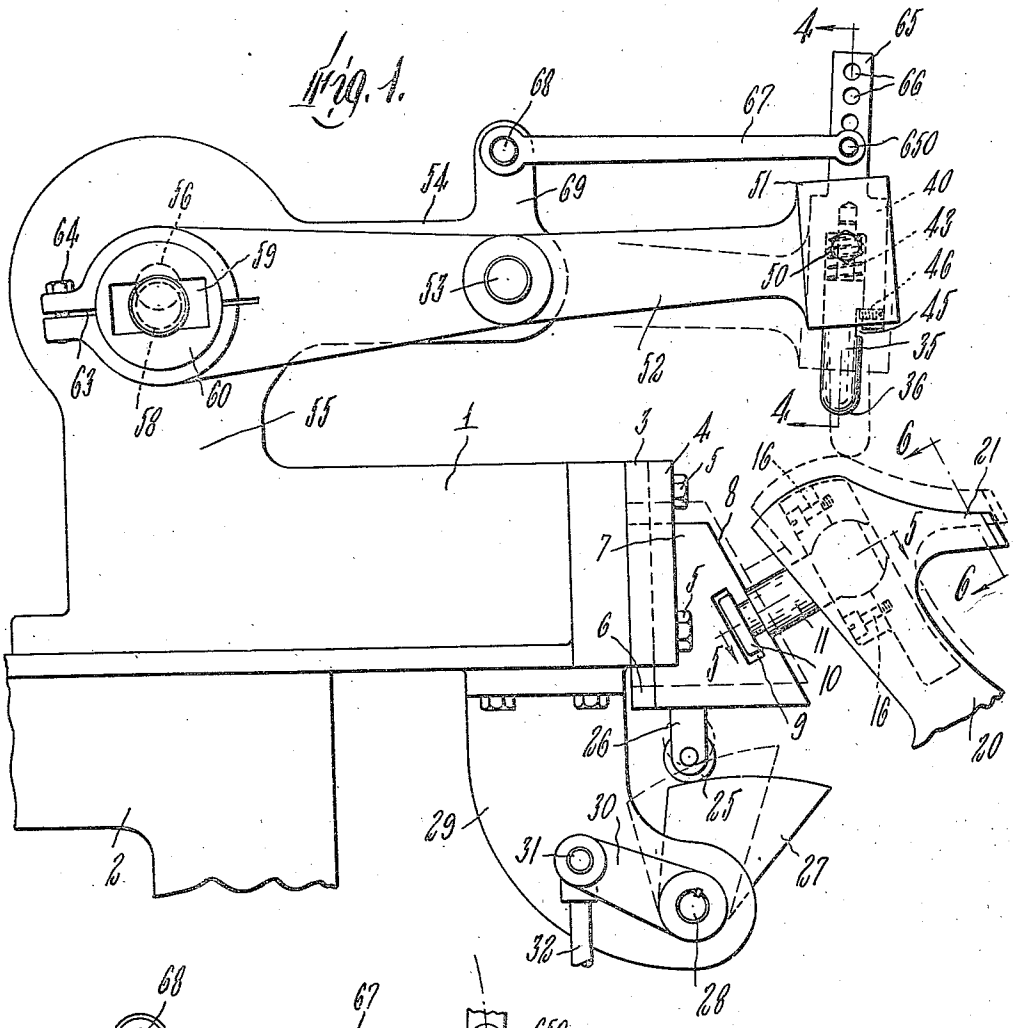


Fig. 1.

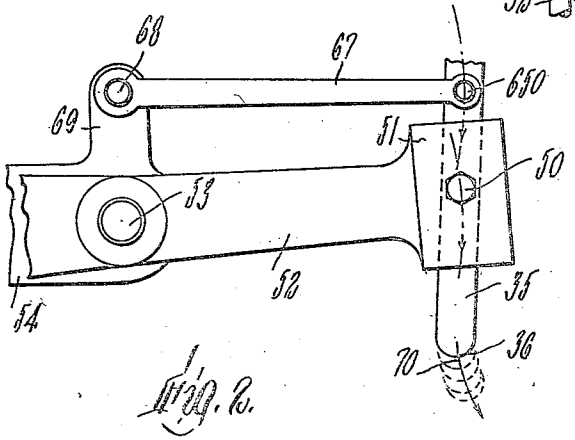


Fig. 2.

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SHOE UPPER SHAPING MACHINE

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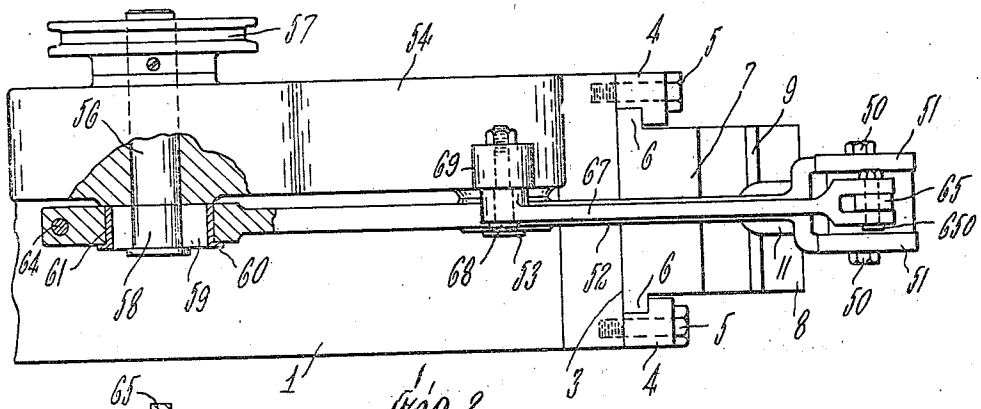


Fig. 3.

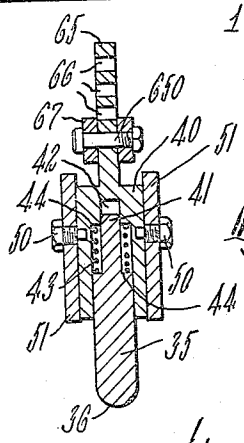


Fig. 4.

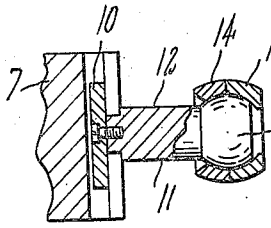


Fig. 5.

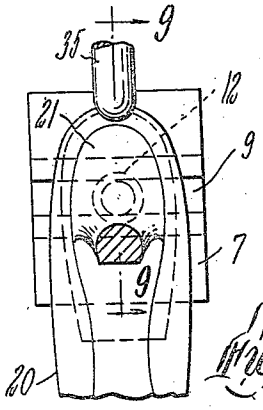


Fig. 6.

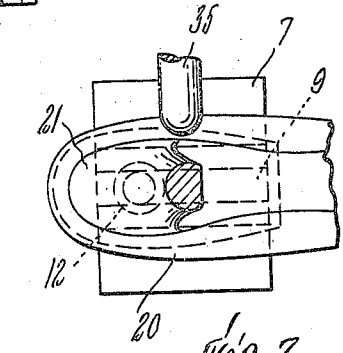


Fig. 7.

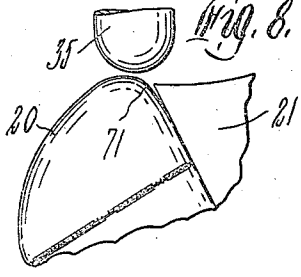


Fig. 8.

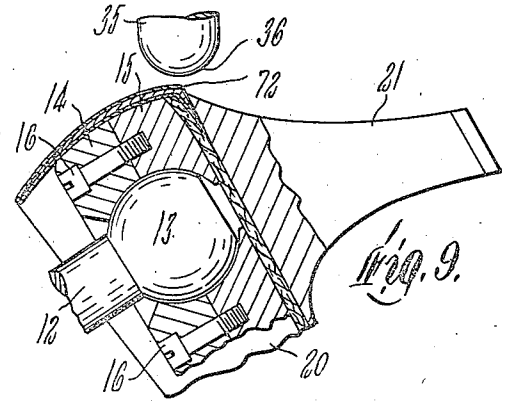


Fig. 9.

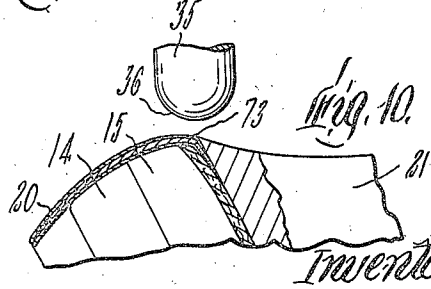


Fig. 10.

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SHOE UPPER SHAPING MACHINE

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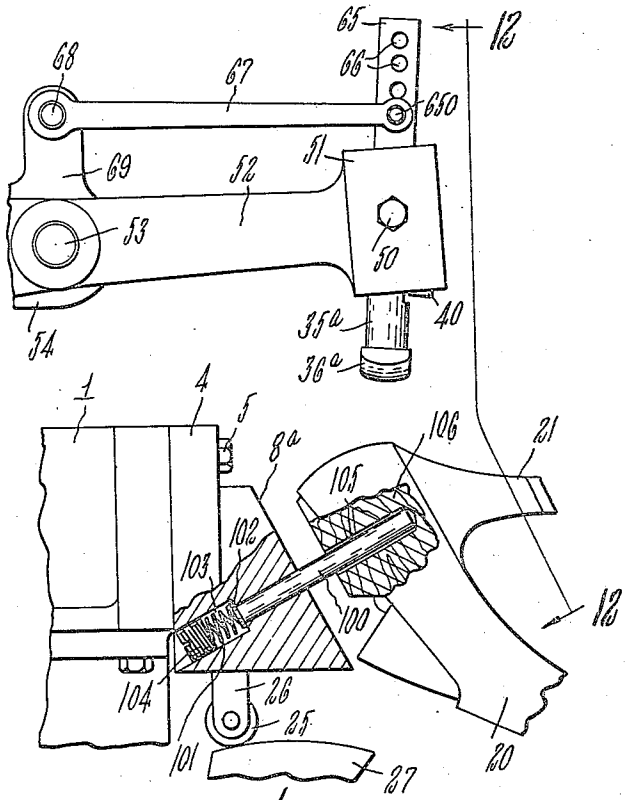


Fig. 11.

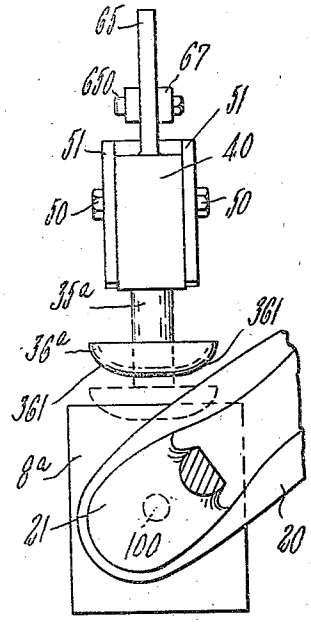


Fig. 12.

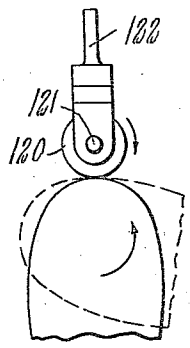


Fig. 14.

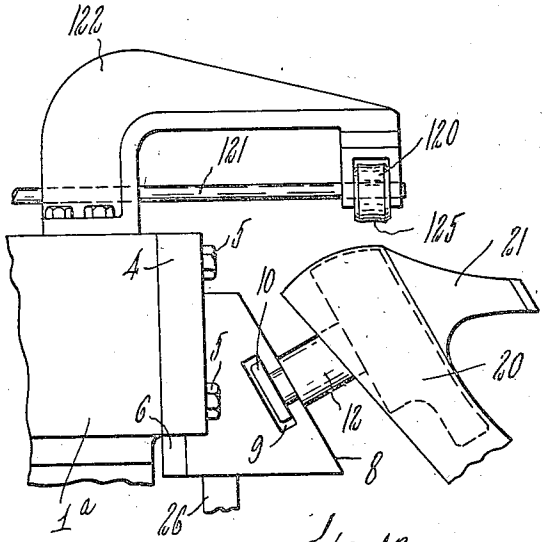


Fig. 13.

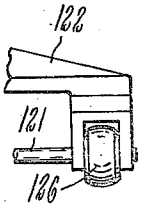


Fig. 15.

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2,276,029

UNITED STATES PATENT OFFICE

2,276,029

SHOE UPPER SHAPING MACHINE

Milton L. Dodge, Newburyport, Mass.

Application August 19, 1939, Serial No. 291,051

13 Claims. (Cl. 12—51)

It is desirable in shoes provided with heels which contact directly with the shoe uppers at their top margins, such as wood heels, that the shoe uppers around the heel seats merge smoothly with the contours of the heels, but particularly where a molded counter is employed, the shoe as formed on the last is likely to present an outwardly projecting ridge adjacent to the top edge of the heel. This ridge may be more accentuated at one portion than at another, due often to slight displacement of the heel from its proper position. Often, also, the margin of the heel seat of the shoe is sufficiently uneven so that the top edge of the heel margin does not contact therewith throughout its entire length, leaving a gap or "grin." It has been the custom heretofore, therefore, for the operator to pound the upper with a hand hammer just above the heel margin in directions to reduce the ridge and to close any gaps or "grins." The success of this operation has depended wholly on the care, skill, and time expended by the operator, and because of the additional expense in manufacture involved, this operation is often imperfectly done.

An object of the present invention, therefore, is to provide mechanism for performing this operation to speed it up and to require less skill and care by the operator in doing it satisfactorily.

In accordance with this invention, therefore, a tool for performing the desired operation is provided, together with means for supporting the shoe for proper presentation to the tool, and means for causing the tool to perform the desired operation on the shoe so held.

For a more complete understanding of this invention, reference may be had to the accompanying drawings, in which

Figure 1 is a side elevation of the upper portion of a machine embodying the invention.

Figure 2 is a fragmentary somewhat diagrammatic elevation of the same, showing the path of motion of the tool.

Figure 3 is a top plan of the machine.

Figures 4, 5 and 6 are detail sections on correspondingly numbered section lines of Figure 1.

Figure 7 is a view similar to Figure 6, but showing the shoe in a different relation to the tool.

Figure 8 is a fragmentary side elevation showing the shoe and the tool in position where the shoe shows a "grin" to be closed up by the action of the tool.

Figure 9 is a detail section on line 9—9 of Figure 6.

Figure 10 is a view somewhat similar to a portion of Figure 9, but showing the shoe upper properly shaped.

Figure 11 is a view similar to a portion of Figure 1, but showing a modification in which the shoe is treated while on the last.

Figure 12 is a view somewhat similar to Figure 7, but showing the modification of Figure 11.

Figure 13 is a view similar to Figure 11, but showing a further modification.

Figure 14 is a fragmentary front elevation of the machine of Figure 13.

Figure 15 is a view similar to a portion of Figure 13, but showing a different form of treating tool.

Referring first to Figures 1 to 5, inclusive, there is shown a supporting frame 1 which may be carried by a pedestal or bench 2. The forward face of the support 1 is provided with a slideway 3 formed by a pair of angle-shaped strips 4 which are secured to the support as by the screws 5. These strips 4 engage over a base flange 6 on a slide 7 which is thus mounted for vertical sliding motion. The forward face 8 of the slide 7 is upwardly and rearwardly inclined and is provided with a T slot 9 extending transversely thereof for supporting the head 10 of a second slide 11 which may move horizontally in a transverse direction.

As shown best in Figure 5, this head 10 is secured to the reduced extremity of a shank portion 12 of this second slide which terminates at its outer end in a spherical segmental head 13. This head 13 is enclosed by a pair of members 14 and 15 shaped to bear rockably thereon and which are secured together as by means of screws 16 (see Figure 1). The members 14 and 15 together constitute an inside form over which may be placed the heel end portion of a shoe 20 which it is desired to treat, this shoe, as shown in Figure 1, being provided with a heel 21 of the wood heel type. The shoe is thus supported for universal angular and bodily motion. The slide 7 is provided at its lower end with a cam follower roll 25 journaled in an extension 26 therefrom, this follower roll riding on the upper face of an edge cam 27 secured to a rock shaft 28 journaled in a bracket 29 secured to the lower face of the support 1. This rock shaft 28 has an arm 30 keyed thereto and the outer end of this arm is shown as pivotally connected at 31 to a rod 32. This rod extends downwardly and is intended to have secured at its lower end a treadle, or other means, by which it may be actuated by the operator in order to rock the cam 27.

It will be noted from an inspection of Figure 1

that the cam 27 has a peripheral face eccentric to the shaft 28, the rear portion of this face being at a less distance from the axis of the shaft 28 than the outer portion thereof, so that as the rod 32 is depressed from the full line position shown in Figure 1, the cam 27 is rocked from the full line position shown toward the dotted line position, causing the follower roll 25, and with it the slide 7, to be lifted as the rod 32 is lowered. This is for the purpose of bringing the shoe carried by the form 14—15 into operative relation to a tool positioned thereabove and which is adapted to be actuated to perform the desired operation on the shoe.

In the construction shown in Figures 1 to 12, inclusive, this tool comprises a reciprocating hammer and in the form shown in Figures 1 to 10, inclusive, this hammer 35 is provided with a rounded active end 36 positioned to strike upon the upper a shoe supported on the form adjacent to its heel seat portion and cause it to be pounded down to merge with the adjacent surface of the heel 21.

This hammer 35, as shown best in Figure 4, is slidable axially within a socket member 40 and has a reduced diameter shank portion 41 which rides in a reduced diameter portion 42 of the socket member. This reduced diameter portion 41 of the hammer, beneath the reduced diameter portion 42, is surrounded by a coil spring 43 which reacts between an annular shoulder 44 on the hammer and an annular shoulder 44 of the socket member. In order to hold the hammer within the socket member it may be provided with an elongated notch 45 (see Figure 1) in its side face into which projects a set screw 46 projecting inwardly from the side wall of the socket member 40. The socket member 40, in turn, is pivoted on the trunnion screws 50 extending inwardly from side walls 51 of the forward forked extremity of a lever 52, which is fulcrumed on a pivot pin 53 projecting from an arm extension 54 of an upstanding wall member 55 of the support 1. This wall member 55 has journaled therein an actuating shaft 56 provided with a belt pulley 57, or other suitable means for rotating it. At one side of the wall member 55 the shaft 56 has a crank pin portion 58 which rides in a slot 59 of a bushing 60 clamped in a circular opening 61 in the rear end of the lever arm 52, this end of the lever arm being split, as shown at 63, and the split portions being secured together by the clamping screw 64 which serves to retain the bushing 60 in position.

By rotation of the shaft 56, the arm 52 will be rocked through a suitable arc, this resulting in oscillation of the hammer 35. In order, however, that this hammer shall have a path of motion such that blows struck thereby will tend to close up any gaps between the shoe upper and the heel, and will pound down the marginal ridge into a substantial continuation of the shoe heel contour, provision is made by which the hammer may have a wiping stroke tending to pound the shoe upper toward the heel. To this end, the socket member 40 is shown as provided with an upward extension 65 to which may be pivotally secured as at 650, through any selected of a plurality of perforations 66, the forward end of a link 67, the rear end of which is pivoted as at 68 to an upward extension 69 at the forward end of the arm extension 54. By suitable adjustment of the attachment of the forward end of the link 67 to the portion 65, the amount of this wiping motion may be determined. This is shown diagrammatically in Figure 2, in which the pivotal connection 50 between the socket member and the arm 52 moves in an arc about the fulcrum 53 as a center, while the pivotal connection 650 moves in an arc about the pivot 68 as a center. The resultant motion of the striking end 36 of the hammer is shown by the curved arrow 70. My proper selection of the hole 66, the amount of this wiping effect may be adjusted as desired for any particular fault in the shoe. Where a "grin" 71 is to be closed up, as shown in Figure 8, a considerable amount of wipe may be desirable, while where the ridge 72 shown in Figure 9 is to be reduced, less wipe or even no wipe at all may be preferable. In either case it is desirable to shape the shoe upper to form a smooth continuation of the contour of the heel as at 73 shown in Figure 10.

The severity with which the hammer acts may be determined partly by the strength of the spring 43 and partly by the extent of the treadle movement which determines the extent to which the shoe is lifted into the effective zone of operation of the hammer, the lower limit of which is determined by the lower limit of rocking of the outer end of the arm 52 and the lowest position of the hammer as determined by the set screw 46 and the slot 45. Where the shoe is lifted insufficiently to come within this active zone of the hammer, of course the hammer will not reach it, while if it is moved up into this zone, the hammer will reach it and the limit of motion of the hammer will be determined by the position of the shoe surface which is contacted thereby.

For operation about the heel end of the shoe and for a limited distance on either side, the operator may swing the shoe about the spherical head 13 of its support. When the side portions and the shank forwardly thereof are being operated upon, the shoe will be turned up into substantially horizontal direction as shown in Figure 7, and the slide 11 pushed laterally of the slide 7 to the required extent as shown in Figure 7.

In some cases it may be desired to perform this operation on the shoe while it is still on the last. Where this is the case, a modification of the machine shown in Figures 11 and 12 may be employed. In this modification the hammer 35a is provided with a laterally extended head 36a, the end portions being relieved as at 361. In place of the cross slide 11 with its supporting form for the shoe, the main slide 8a will be provided with a jack pin 100, which is preferably yieldably supported as by a spring 101 engaging its head 102 and seated in a socket 103, the rear end of which may be closed as by a threaded plug 104 which also supports the rear end of the spring 101. This jack pin is preferably of a diameter slightly less than that of the jack pin hole 105 of the last 106 on which the shoe is supported so as to allow some play of the shoe thereon such that the operator may be able to turn or otherwise manipulate the shoe to some extent freely. The spring allows for adjustment for variations in the jack pin holes of different lasts and varation of the heel seats because of variations in the positioning of the shoe on the last. Otherwise, the mechanism may be the same as that heretofore described, so that the operator may lift the shoe up into position for the hammer to strike thereon. No substantial lateral motion of the shoe is permitted with this mounting, but the relieved extensions 361 of the extended hammer head are so shaped that they can engage in and treat the shank portions of the shoe upper adjacent to the

heel seat without providing for such lateral motion, the shoe when being operated upon at one of these portions being turned upwardly as shown in Figure 12 about an axis substantially centrally of and perpendicular to its heel seat.

In place of employing a hammer for operating on the shoe upper, a roll may be substituted, as shown in Figures 13 and 14, and for best results this roll is power driven though it may be a free roll, if desired. The power driven roll tends to eliminate wrinkles. The roll **120** shown in Figure 13 is therefore carried by a driving shaft **121**, both the shaft and the roll being mounted in a bracket member **122** carried by the support *1a*. The shoe may be carried either on a form as illustrated in Figure 3, or where it is on the last when treated, it may be mounted as illustrated in Figure 11. The power drive of the shaft **121** and the roll **120** will serve to aid in feeding the shoe, starting in on one side and passing around the heel end and terminating on the other side, the shoe being rocked, as shown diagrammatically in Figure 14, while it is held in contact with the roll.

As shown in Figure 13, the active face **125** of the roll **120** is formed concave, but where the treatment is to be made well into the shank, particularly on the inside wall of the shoe, it may be desirable to employ a somewhat convexed roll as shown at **126** in Figure 15 in order to properly engage the shoe upper, this shape also being effective on the sides and back as well as on the shank portions.

From the foregoing description of certain embodiments of this invention, it should be evident to those skilled in the art that various changes and modifications might be made without departing from the spirit or scope of this invention as defined by the appended claims.

I claim:

1. A machine of the class described comprising an upper shaping tool, means for moving said tool, means for supporting a shoe beneath said tool, said supporting means presenting the counter portion of said shoe adjacent to the sole upwardly and beneath said tool, and means for moving said support upwardly to bring a shoe thereon into operative relation to said tool.

2. A machine of the class described comprising an upper shaping tool, means for moving said tool up and down, means for supporting a shoe beneath said tool, said supporting means presenting the counter portion of said shoe adjacent to the sole upwardly and beneath said tool, and means for moving said support upwardly to bring a shoe thereon within the path of motion of said tool.

3. A machine of the class described comprising an upper shaping tool, means for moving said tool, means for supporting a shoe beneath said tool, said supporting means presenting the counter portion of said shoe adjacent to the sole upwardly and beneath said tool, and means for moving said support upwardly to bring a shoe thereon into operative relation to said tool, said supporting means supporting said shoe with capability of motion to present various parts of said shoe portion into treating relation to said tool.

4. A machine of the class described, comprising an upper shaping tool, a support, a slide movable on said support toward and from said tool, a second slide carried by said first mentioned slide for motion transverse to the motion of said first mentioned slide, a form on which a shoe may be supported rockably carried by said second slide for supporting a shoe in operative relation to said tool when said first mentioned slide is in one position, and operator-controlled means for moving said first mentioned slide to bring a shoe on said form into and out of cooperative relation to said tool, motion of said second slide permitting the operator to bring selected portions of a shoe on said form into and out of the operative zone of said tool.

5. A machine of the class described, comprising an upper shaping tool, a support, a slide movable on said support toward and from said tool, a second slide carried by said first mentioned slide for motion transverse to the motion of said first mentioned slide, a form on which a shoe may be supported rockably carried by said second slide for supporting a shoe in operative relation to said tool when said first mentioned slide is in one position, operator-controlled means for moving said first mentioned slide to bring a shoe on said form into and out of cooperative relation to said tool, motion of said second slide permitting the operator to bring selected portions of a shoe on said form into and out of the operative zone of said tool, and means to actuate said tool.

6. A machine of the class described, comprising an upper working tool, means for moving said tool up and down, a support, a member mounted on said support for up and down motion beneath said tool, a jack pin projecting upwardly and outwardly toward said tool from said member and over which the jack hole of a last may be placed to present the lower side portion of the upper of a shoe on said last about the heel seat into operative relation to said tool, and operator-controlled means for moving said member.

7. A machine of the class described, comprising an upper working tool, a support, a member mounted on said support for movement from and toward said tool, a jack pin carried by said member over which the jack hole of a last may be placed to present the lower portion of the upper of a shoe on said last about the heel seat in operative relation to said tool, and operator-controlled means for moving said member, said pin being mounted for axially yielding motion in said member.

8. A machine of the class described, comprising a hammer, means for reciprocating said hammer in a path of normally constant amplitude, and means for supporting a shoe for selective presentation of the lower portion of its upper about the heel seat to impact from said hammer, said reciprocating means having cooperating parts rocking said hammer during its reciprocation to produce a component of pounding effect directed toward the heel seat edge of a heel of the wood heel type secured to said shoe.

9. A machine of the class described, comprising a support, an arm fulcrumed on said support, means for oscillating said arm, a hammer spring-supported from said arm at one side of said fulcrum, a link pivoted at one end to said support and at its opposite end to said hammer to control with said pivotal arm the path of motion of said hammer, and means for supporting a shoe in position to be struck by said hammer.

10. A machine of the class described, comprising a hammer having a shank and a head carried by one end of said shank, means for vibrating said hammer substantially lengthwise of said shank, and means for presenting a shoe with capability of turning about an axis sub-

stantially centrally of and perpendicular to its heel seat to present its sides and heel end adjacent to said heel seat in operative relation to said hammer, the end portions of said hammer at its pounding face being rounded and relieved to properly shape the shoe upper in the shank adjacent to the sole when the shoe is turned to present its shank portions thereto.

11. In combination, a hammer having a head for shaping the upper of a shoe adjacent to the top margin of the shoe heel, said head having an elongated convex working face relieved at its ends for engagement with the shoe upper in the shank portion, and means for presenting the upper of a shoe to said hammer with the direction of elongation substantially following the line of the shoe sole.

12. A machine of the class described, comprising a tool for shaping the upper of a shoe adjacent to the top margin of the heel, means for supporting a shoe to be treated by said tool for universal angular and bodily motion relative to said tool, and means for relatively moving said tool and supporting means toward and from each other.

13. A machine of the class described comprising means for movably supporting a shoe provided with a heel of the wood heel type wherein the margin of the heel should engage the shoe upper, a tool, and means for moving said tool and work support relatively to bring the shoe and tool into or out of operative relation and when in operative relation causing the tool on manipulation of the shoe on said support to force the shoe upper to the last and into smooth close engagement about the sides and back of the heel seat with the heel margin, said moving means including mechanism for imparting a component of motion of the tool toward the shoe heel.

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