May 24, 1949. E. E. SABIN 2,470,866

ROUGHING MACHINE

Filed May 22, 1947 3 Sheets-Sheet 1

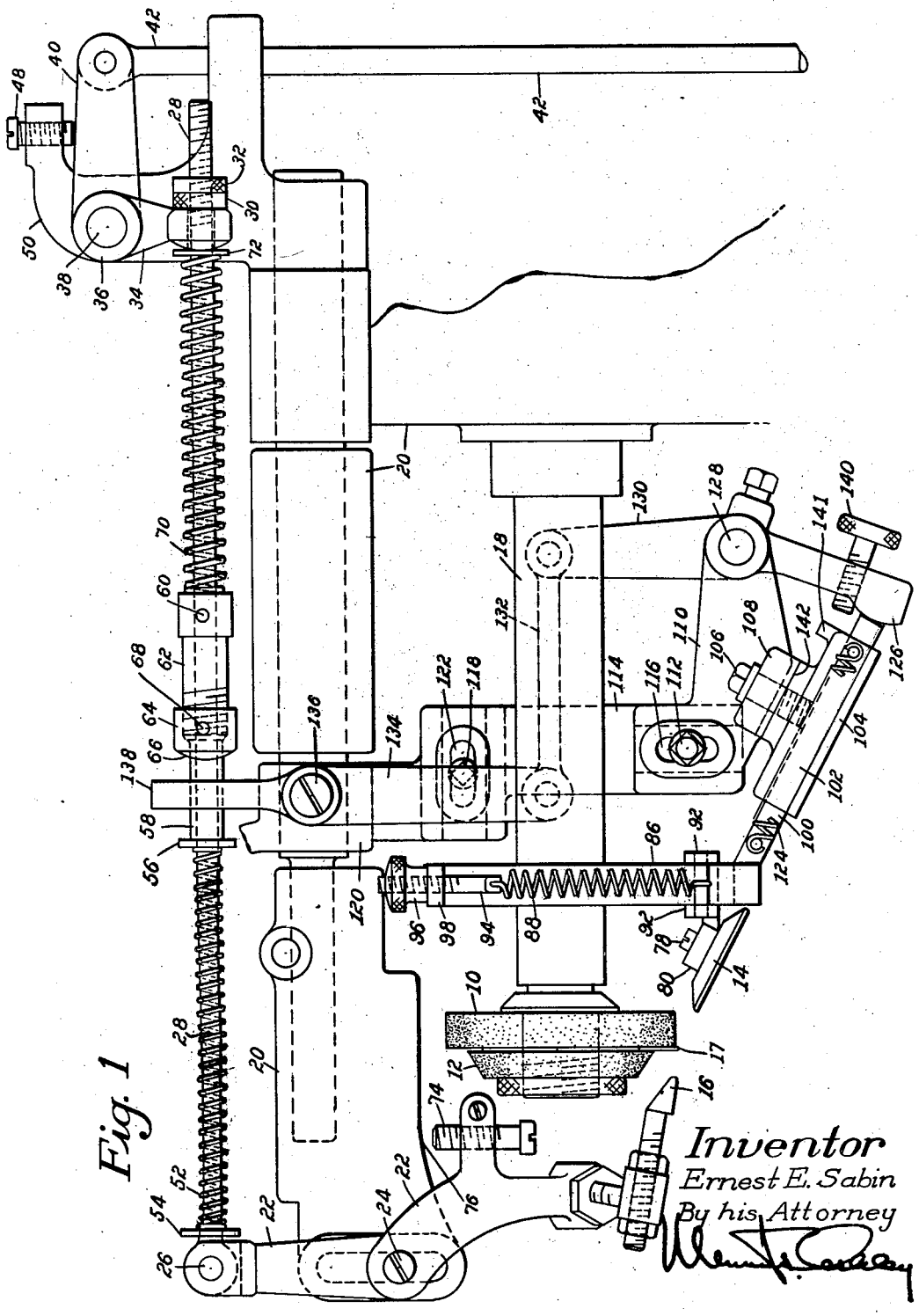


Fig. 1

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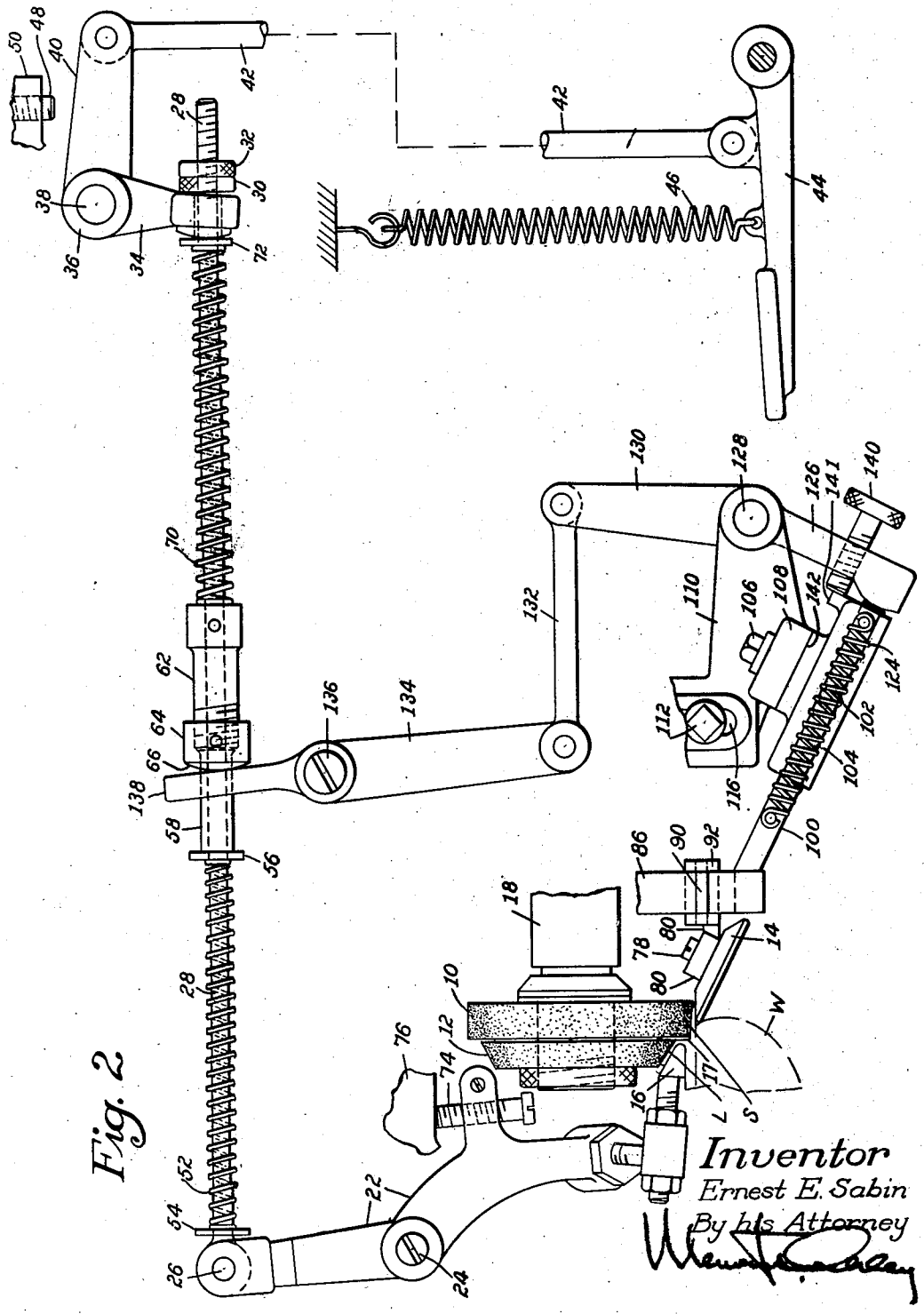


Fig. 2

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Fig. 3

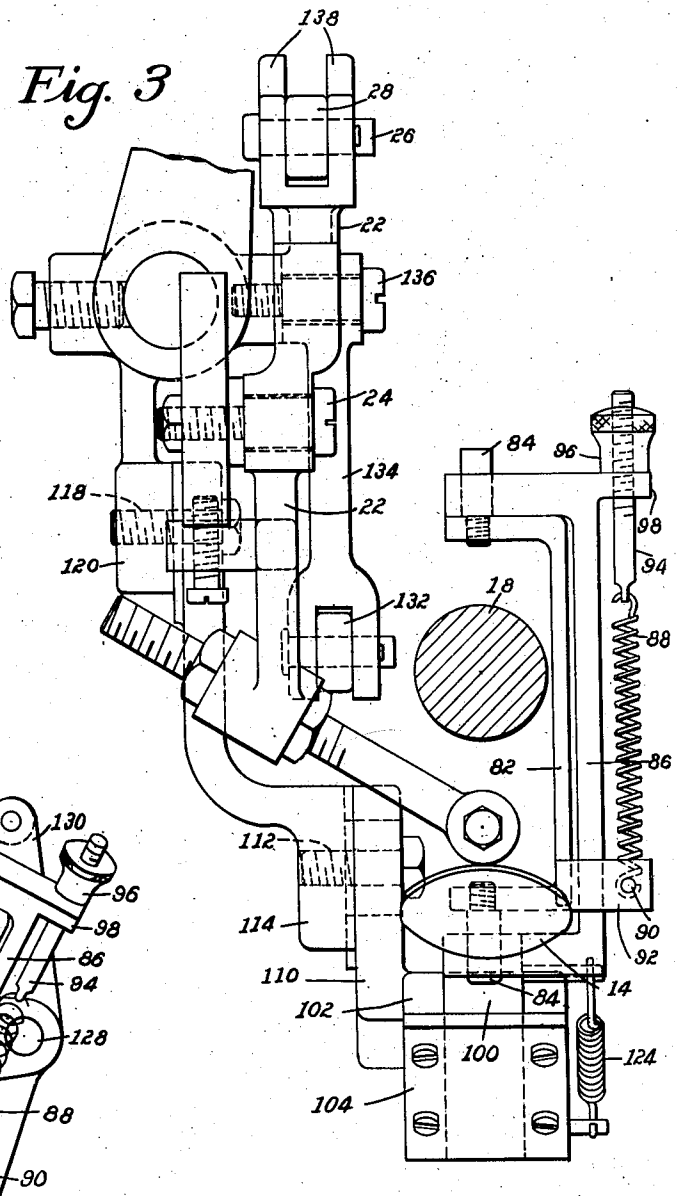
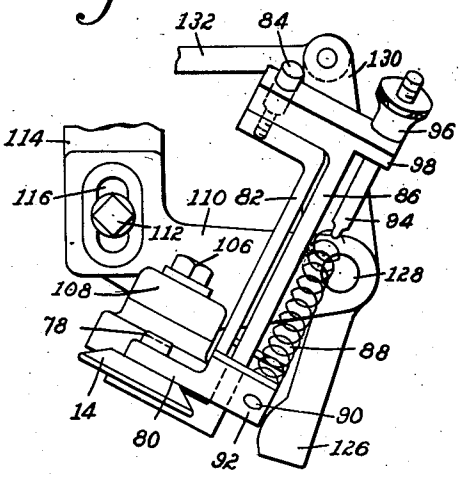


Fig. 4



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UNITED STATES PATENT OFFICE

2,470,866

ROUGHING MACHINE

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3 Claims. (Cl. 69—1)

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This invention relates to roughing machines and is herein illustrated and described as embodied in a shoe sole channel roughing machine of the type disclosed in United States Letters Patent No. 2,179,507, granted November 14, 1939, upon the application of Arthur S. Johnson. Such a machine is provided with a pair of rotary roughing brushes for engaging the base of a channel and the inner surface of the channel lip simultaneously and it is provided also with a work support for yieldably holding the channel lip with its inner surface against one of the roughing brushes. It has been found in certain types of work, for example, in shoes wherein the sole is reduced to a thin edge at the shank portion, that a support for the margin of the sole at this portion is desirable.

It is an object of the present invention to provide an improved channel roughing machine having work supports for both the channel lip and the margin of the sole. As shown herein, an illustrative machine embodying the invention is provided with a pair of roughing tools and with a pair of work supports which are held against different parts of the shoe with individually yielding pressures to support said parts against their respective roughing tools, and it is provided also with a common control means connected to these work supports for enabling the operator to control the application and release of pressure. In accordance with a feature of the invention, the common control means includes a treadle and a lost motion connection so arranged as to enable only one of the work supports to be operated upon a partial depression of the treadle. In accordance with a further feature, provision is made not only for guiding one of the work supports over the slight range of movement necessary to enable it to develop its working pressure but also for moving it to an inoperative position far removed from its associated roughing tool when its use is not desired.

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

Referring now to the accompanying drawings,

Fig. 1 is a front elevation of an illustrative machine showing the operating instrumentalities with the work supports in their initial positions;

Fig. 2 is a view similar to Fig. 1 showing the work supports in their working positions;

Fig. 3 is an end elevation of a portion of the machine; and

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Fig. 4 is a front elevation showing the sole margin work support in its out-of-the-way position.

The work engaging instrumentalities of the illustrated machine comprise a pair of roughing tools in the form of rotary brushes 10 and 12, a thin blade-like gage 17 between the brushes, a work support 14, and a work support 16. In Fig. 2 these members are shown in operative engagement with a work piece W consisting of a shoe having a sole S upon which is formed a channel lip L. The work support 14 is shown in engagement with the marginal portion of the sole to hold the base of the channel against the brush 10 and the work support 16 is shown as holding the channel lip against the brush 12. The brushes 10 and 12 are mounted side by side upon a shaft 18 which is journaled in suitable bearings mounted in a frame designated generally by the reference numeral 20. The work support 16 is mounted indirectly, with provision for various adjustments, upon a lever 22 which is fulcrumed upon a stationary stud 24 carried by the frame 20 with provision for heightwise adjustment of the stud in the frame.

Except for the presence of the work support 14 the illustrated machine, as so far described, is substantially like the machine shown in United States Letters Patent 2,179,507, above mentioned, to which reference may be had for a more complete disclosure of its construction and mode of operation.

The connections between the treadle and work support 16 of the machine illustrated herein will now be described. Pivotally connected to the upper end of the lever 22 by a pin 26 is the left hand end of a rod 28 which extends horizontally substantially parallel to the shaft 18. Threaded upon the right hand end of the rod 28 is a knurled abutment nut 30 which is maintained in any desired position of adjustment upon the rod by a lock nut 32. A crank arm 34 having a clearance opening in its lower free end to receive the rod 28 bears against the nut 30. The arm 34 has a hub 36 freely rotatable upon a stationary stud 38 secured in the frame 20. Extending from the hub 36 is a crank arm 40 to the free end of which is secured the upper end of a treadle rod 42, the lower end of this treadle rod being pivotally connected to a treadle 44 at the base of the machine. A spring 46 normally holds the treadle raised to a position determined by a stop screw 48 which is adjustably threaded through a stationary bracket 50 car-

ried by the machine frame, the lower end of the screw 48 engaging the crank arm 40.

Inward movement of the work support 16 toward working position is effected through a spring 52 which surrounds the rod 28 and which, at its left hand end, bears against a washer 54 on the rod 28, this washer being held against end thrust to the left by a boss formed on the rod 28 to receive the pin 26. The right hand end of the spring 52 bears against a washer 56 backed by a sleeve 58 which is freely slidable upon the rod 28. The sleeve 58 has a right hand portion 62 which is of greater external diameter than the left hand portion and which is threaded to receive a cup-shaped nut 64 having a central opening in its base to fit around the reduced left hand portion. The base of the nut 64 has a convex abutment surface 66. Formed in the sleeve portion 62 and in the nut 64 are capstan holes 68 and 68 to receive a spanner wrench by which the nut 64 can be adjusted axially on the sleeve 58. Abutting the right hand end of the sleeve portion 62 is the left hand end of a coil compression spring 70 and interposed between the right hand end of this spring and the lower end of the crank arm 34 is a washer 72. It is evident that the springs 70 and 52 will normally urge the rod 28 as far to the left as permitted by the engagement of the nut 30 with the crank arm 34 and that depression of the treadle 44 will yieldingly urge the rod 28 to the left to bring the work support 16 into its working position. The spring 52 is weaker than the spring 70 and is of suitable strength to hold the work support 16 against the channel lip L with desired pressure. In order to limit the depth to which the channel lip L can be abraded, the lever 22 is provided with a stop screw 74, the upper end of which engages a stationary abutment 76 on the machine frame. Adjustment of the screw 74 can be made to accommodate different thicknesses of the channel lips to be operated upon.

The work support 14 for the margin of the sole is useful for operations upon women's shoes wherein the soles are reduced to thin edges at the shank portion. It consists of a disk or wheel freely rotatable upon a pin 78. The disk has a work-engaging surface in the form of a frustum of a cone, the vertex angle of which is about 120°. The axis of the pin 78 is inclined at an angle of about 60° from the horizontal and the work-engaging elements of the frusto-conical surface of the disk are substantially horizontal and parallel to the work-engaging elements of the cylindrical periphery of the roughing brush 10. The pin 78 is secured in a flange 80 which extends from the lower portion of a U-shaped slide 82 having a pair of co-linear bearing pins 84. These bearing pins 84 are slidably mounted in suitable guideways formed in a U-shaped bracket 86 to guide the slide 82 for heightwise movement. The slide 82 is normally held at the upper limit of its movement by a tension spring 88, the lower end of which is secured to a pin 90 extending between a pair of ears 92 which are integral with the slide 82 and which embrace the upstanding portion of the bracket 86. The upper end of the spring 88 is secured to the lower end of a pin 94 upon the upper portion of which is threaded a knurled nut 96. The pin 94 extends downwardly through an opening in a flange 98 on the bracket 86 and the nut 96 engages the upper surface of the flange 98. Turning the nut 96 adjusts the tension of the spring 88.

The bracket 86 is secured upon the upper and

left hand end of an inclined slide 100 which is slidably in a guideway formed in a block 102. A cover plate 104 retains the slide 100 in its guideway. The block 102 is secured by a clamping screw 106 to a lug 108 extending from a stationary bracket 110. This bracket 110 is secured by a clamping screw 112 to a stationary bracket 114 and has a tongue-and-groove engagement therewith to provide for heightwise adjustment. The bracket 110 accordingly has formed therein a heightwise slot 116 to accommodate the screw 112 for all positions of such adjustment. The bracket 114 is secured by a clamping screw 118 to a stationary bracket 120 which, in turn, is secured to a stationary portion of the machine frame 20. The bracket 114 has a tongue-and-groove engagement with the bracket 120 to provide for horizontal adjustment, the bracket 114 having a horizontal slot 122 to accommodate the screw 118 for all positions of such adjustment.

The slide 100 is normally urged down and toward the right by a tension spring 124, the left hand end of which is secured to the slide and the right hand end of which is secured to the block 102. Engageable with the lower and right hand end of the slide 100 is a lever 126 pivotally mounted upon a stationary fulcrum pin 128 secured in the bracket 110. The lever 126 has an upwardly extending arm 130 which is pivotally connected to the right hand end of a link 132. The left hand end of the link 132 is pivotally connected to the lower end of a lever 134 which is pivotally mounted upon a fulcrum pin 136 secured in the stationary frame 20. The lever 134, under the influence of the spring 124 and gravity, normally occupies the position shown in Fig. 1. An upward extension of the lever 134 has formed in it a pair of ears 138 which embrace the reduced portion of the sleeve 58 and which are engageable by the convex abutment surface 66 on the nut 64. It is evident that depression of the crank arm 40 acting through the spring 70 serves to move the lever 134 in a counterclockwise direction as viewed in Figs. 1 and 2, thereby urging the work support 14 from its lower, initial position up into its upper of work-pressing position as shown in Fig. 2. A stop screw 140 threaded through the lever 126 engages a lug 141 extending from the block 102 to limit such upward movement of the work support 14. The screw 140 prevents excessive abrasion of the channel base and should be adjusted in accordance with the thickness of the sole margin. The spring 88 limits the degree of pressure which can be exerted by the work support 14.

In certain classes of work such as men's shoes having soles which are not reduced at the shank portion, no support is required for the margin of the sole S and it is, accordingly, desirable to provide for moving the work support 14 to an out-of-the-way position far removed from the roughing brushes in such cases. To this end, the block 102 and the lug 108 are provided with finished surfaces 142 to facilitate rotation of the block 102 about the screw 106 when the latter has been turned to loosen its clamping action. The axis of the screw 106 is parallel to the axis of the pin 78 and the block 102 may be swung through an angle of 90° as shown in Fig. 4 or, if desired, it may be swung through a greater angle and the screw 106 may be tightened to hold the work support 14 in its out-of-the-way position. The path of movement of the slide 100 is normal to the axis of the screw and, when

the block 102 is in operating position, is inclined 30° to the horizontal.

In the operation of the machine, depression of the treadle will first cause the work support 16 to be brought into work pressing position. As shown in Fig. 1, the sleeve 58 must move some distance to the left before the abutment surface 66 engages the ears 138 to move the work support 14 into work pressing position. The lost motion thus provided by the initial separation of the surface 66 from the ears 138 enables the treadle to be depressed far enough to operate the work support 16 without operating the work support 14. The desired extent to which the treadle must be depressed to operate the work support 14 is obtained by adjustment of the axial position of the nut 64 on the sleeve portion 62.

When the operation is to be performed upon women's shoes with reduced shanks, the block 102 is clamped in its operative position as shown in Figs. 1, 2, and 3, and the stop screws 74 and 140 are adjusted in accordance with the thicknesses of the channel lip and the sole margin. The operator, holding the shoe with the heel end away from him, inserts the end portion of the lip L between the work support 16 and the brush 12 and depresses the treadle all the way to cause the work support 16 to hold the lip against the brush 12 with a pressure determined by the spring 52 and also to cause the work support 14 to press the thin margin of the sole at the shank portion up to hold the base of the channel against the brush 10 with a pressure determined by the spring 88. He then feeds the shoe away from him, holding the shoe, as shown in Fig. 2, pressed up and toward the right with the shoulder of the lip against the gage 17. The bristles of the roughing brush 10 are capable of yielding sufficiently to permit the thick, inner portion of the sole margin to be pressed more deeply into the brush than is the thin, peripheral portion (see Fig. 2).

Having thus fed the shoe the length of the shank portion, the operator partially releases the treadle to permit the spring 124 to retract the work support 14 to the position which that member is seen to occupy in Fig. 1. While holding the treadle partially depressed to maintain the work support 16 in operating position, he continues feeding the shoe with the channel lip and the channel base in contact with their respective brushes. The work support 14, which is not needed to support the thick margin of the sole around the forepart of the shoe, is now out of the way. As the opposite side of the shank comes into operating position, he again depresses the treadle fully.

While the movement of the work support 14 from work pressing position is slight, it takes place in a direction inclined to the axis of the roughing brushes, and the resulting displacement of the work support, being both axial and radial with respect to the brushes, is sufficient to prevent its interfering with the manipulation of the shoe.

In many types of shoes it is only the inside of the shank of the sole that has a reduced margin requiring a full depression of the treadle.

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

1. In a machine for roughing shoe parts, a pair of roughing tools for operating simultaneously upon different parts of the same shoe, a pair of work supports engageable respectively with the different parts of the shoe, a treadle, and connections through which depression of the treadle causes each work support to press that part of the shoe with which it is engageable against the tool which operates on that part, said connections having provision for lost motion whereby a partial depression of the treadle operates only one of the work supports and a further depression of the treadle operates the other work support.

2. In a machine for roughing surfaces of channels in shoe parts, a pair of rotary roughing brushes for operating simultaneously upon the lip and the base of a channel formed in the sole of a shoe, a work support engageable with the channel lip to hold the lip against one of said brushes, a work support engageable with the margin of the sole for holding the base of the channel against the other brush, a treadle, a connection from said treadle to the channel lip work support to cause that work support upon depression of the treadle to press the channel lip against one of the roughing brushes, and a lost motion connection between the first-mentioned connection and the sole margin work support constructed and arranged to cause that work support to press the base of the channel against the other roughing brush only upon a depression of the treadle greater than necessary to operate the channel lip work support, whereby the channel lip work support can be operated alone by a partial depression of the treadle and both work supports can be operated by a full depression of the treadle.

3. In a machine for roughing shoe parts, a roughing tool, a work support engageable with a shoe sole, a bracket in which the work support is mounted, said bracket being movable through a short distance to bring the work support from a position wherein the work support is out of contact with a work piece being operated upon by said roughing tool to a position wherein the work support presses the work piece against the tool, means for moving the bracket between said positions, and a mounting for said bracket constructed and arranged to enable the entire bracket and work support assembly to be moved away from the vicinity of the tool to a remote, inoperative and non-interfering position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,036,289	MacKenzie	Apr. 7, 1936
2,069,748	Brostrom	Feb. 9, 1937
2,328,609	Brostrom	Sept. 7, 1943