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FEEDING MEANS FOR SHOE SOLE TREATING MACHINES

Filed Oct. 16, 1940.

2 Sheets-Sheet 1

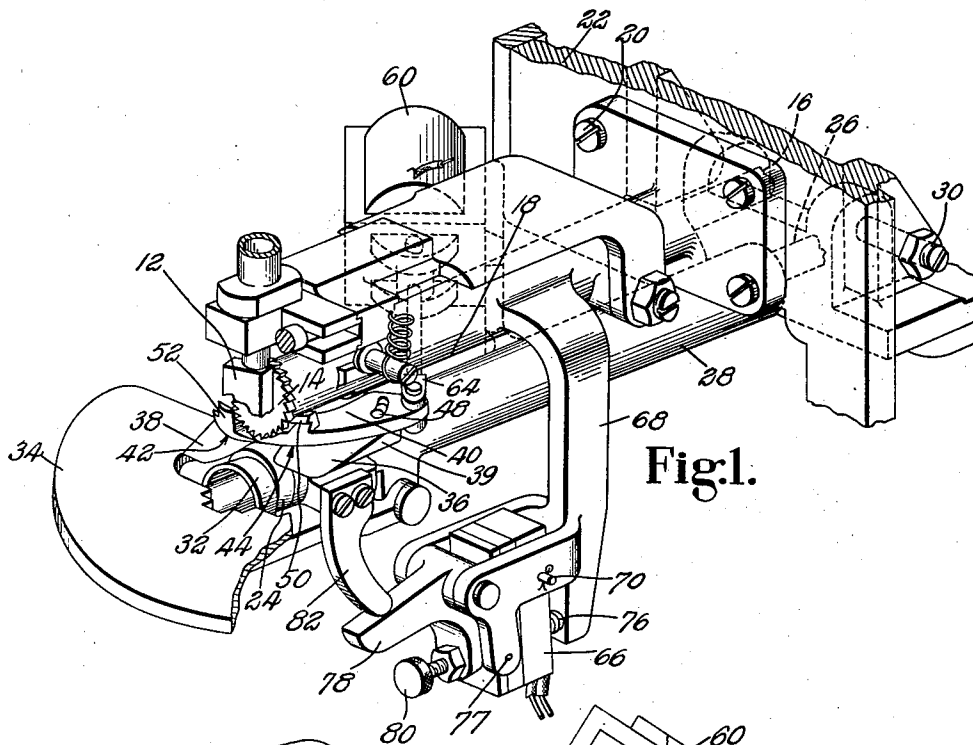


Fig. 1.

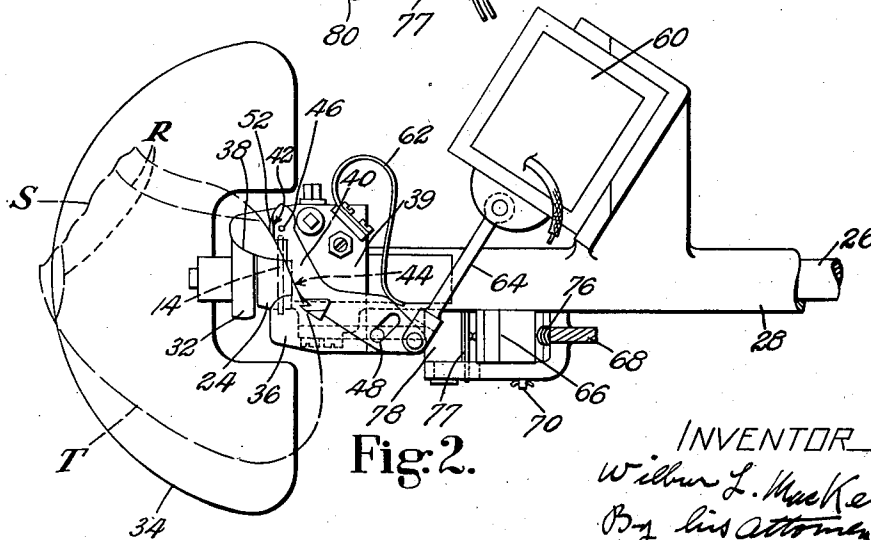


Fig. 2.

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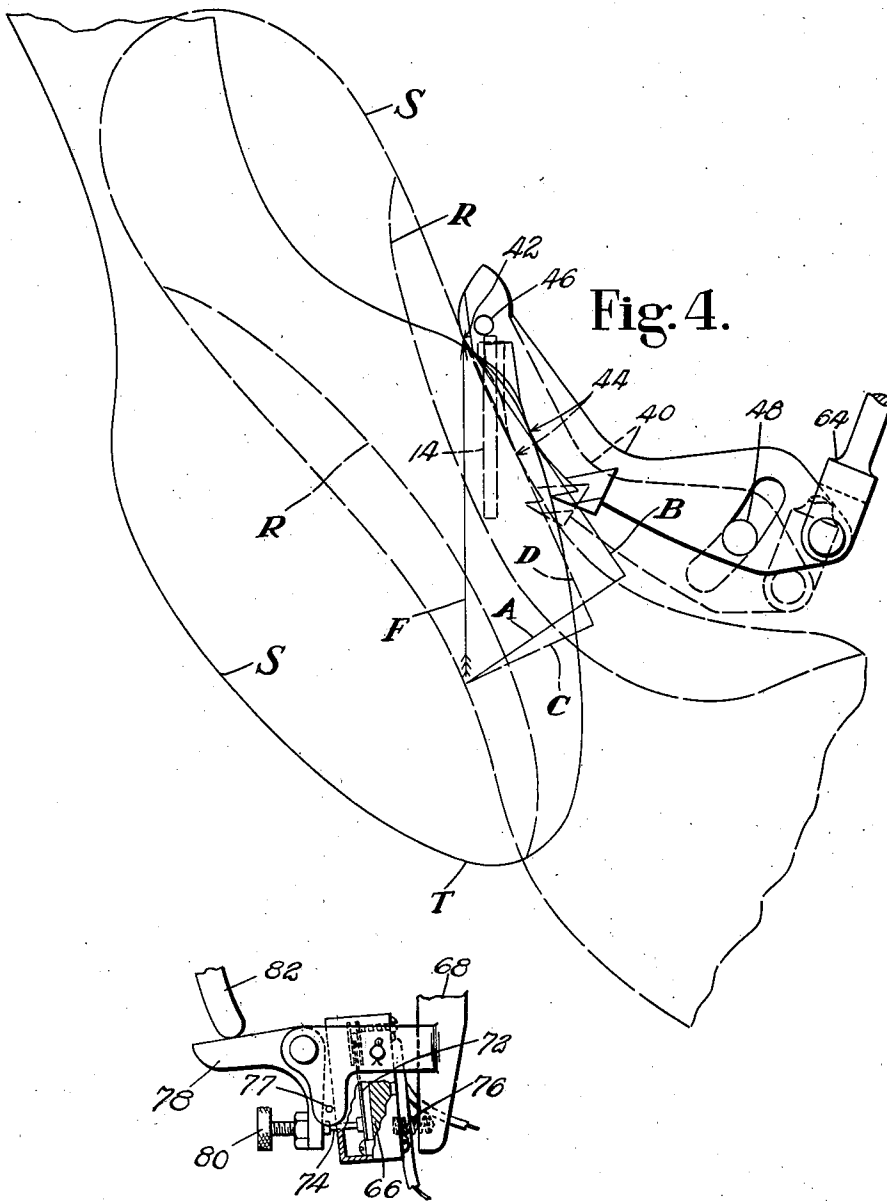


Fig.3.

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UNITED STATES PATENT OFFICE

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FEEDING MEANS FOR SHOE SOLE
TREATING MACHINES

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Application October 16, 1940, Serial No. 361,434

10 Claims. (Cl. 91—25)

This invention relates to machines for treating shoe parts of irregular outline, such as shoe soles, and is herein illustrated as embodied in a machine for applying a band of cement to a peripheral portion of a sole as the latter is fed automatically past the applying member. The invention is illustrated as embodied in a machine of the type described in Letters Patent of the United States No. 2,073,647, granted March 16, 1937, upon the application of C. A. Newhall.

There are numerous shoe parts of curved or irregular outline which require treatment along or near their periphery, and a shoe sole is representative of this class. Since it requires the operations of channeling, reducing, roughing, edge inking, edge setting, cementing etc., these operations can be performed with greatest facility if a so-called automatic feeding mechanism is provided which will carry successive peripheral portions of the sole past an operating point represented by a device which may itself be an operating tool or may only be a gage. Such feeding mechanisms frequently are rendered substantially automatic, so that it is only necessary for the operator to present the work to the machine and then to remove it at the end of the operation, by arranging the feeding mechanism to impart a cross-feed component which holds the work against the sole-edge engaging device while it advances it for treatment. When the pieces of work have fractional portions of reduced thickness, as typified in shoe soles by the reduced shank portions, then it frequently happens that a feeding mechanism which has a cross-feed component entirely suitable for the portions of full thickness is not satisfactory for the thinner portions. In other words, the cross-feed component may be strong enough to push the thin edge portion against the edge engaging device with a force greater than the ability of the edge of the sole to resist deformation.

It is, therefore, an important object of the invention to provide means for varying the cross-feed component of a machine of this type in accordance with changes in a physical characteristic of the work, such as its thickness.

Although it will be understood that the variation of the cross-feed component of a feeding mechanism may be accomplished in various ways, it is illustratively accomplished in the machine herein described by automatically changing the relation between the feed wheel and the gage against which the work is pressed. This may be accomplished by turning the gage with respect

to the feed wheel, thereby to increase or lessen the cross-feed component.

Still another feature of the invention resides in a device for sensing a change in a physical characteristic of the work, such as its thickness, and automatically varying the cross-feed component as by electromagnetic means controlled by this sensing device.

These and other features of the invention will best be understood from a consideration of the following specification taken in connection with the accompanying drawings, in which

Fig. 1 is an angular view of the work-engaging parts of a machine of the type described in the above-mentioned Letters Patent and to which my invention has been applied;

Fig. 2 is a plan view of the portion of these parts which lies below the plane of the work;

Fig. 3 is a detail view showing the sensing switch, which is controlled by the thickness of the work, in circuit-closing position; and

Fig. 4 is a diagrammatic plan view showing the change in the cross-feed action between the forepart and shank portion of a sole.

In the application of a band of cement to the margin of the upper surface of a shoe sole S (Fig. 4) by means of an extruding nozzle 12, the peripheral portion of the sole is progressively presented to the point of treatment by means of a feeding mechanism which includes an upper feed wheel 14, a thin toothed disk which is mounted on a driven shaft 16. This shaft is journaled in an arm 18 which is rigidly attached at 20 to the frame 22 of the machine. Cooperating with this disk-shaped feed wheel 14 is a supporting feed wheel 24 carried on a shaft 26 (Fig. 2) which is journaled in an arm 28 pivotally mounted at 30 in the frame of the machine and held up yieldably, when the treadle (not shown) is depressed, so that it may accommodate work pieces of greater or less thickness. Further support for the sole is provided by a yieldably mounted idle wheel 32 and by a work table 34. The marginal portion of the sole is supported upon wedge-shaped fingers 36, 38, on a plate 39 as its periphery is pressed against an edge gage mechanism 40 having spaced contact points 42 and 44 serving as gaging elements. This gaging mechanism 40 is pivotally mounted to swing about a pin 46 extending upwardly from the plate 39, and the extent of its movement is limited by a pin-and-slot arrangement 48. On the swingably mounted gaging mechanism 40 are an overhanging hook-shaped portion 50 to prevent the sole from overriding the

gaging mechanism and an upstanding wall 52 which latter is at the contact point 42.

The fact that the end face of the feed wheel 14 is in a vertical plane which is angularly related to the line of feed of the work, such as a line connecting the contact points of the gage mechanism 40, causes said wheel to impart a feeding force F, shown in Fig. 4 as parallel to said end face, and having a cross-feed component A and a forward component B. The latter component B advances the work past the operating point and the cross-feed component A holds the sole in contact with the gaging mechanism with a force which is entirely suitable for the forepart or toe portion T of the sole but which may be too great for the reduced shank portions R, where the edge of the work is thinned to an extent which renders it unable to resist the side thrust imparted by the cross-feed component A without deforming or rolling the edge of the sole. Provision is made, therefore, for moving that contact point 44 of the gaging mechanism 40 which is first encountered by the work from the full-line position shown in Fig. 4 to the dotted line position when the thinner reduced portions R are encountered. For this purpose, a sensing device is employed which depends upon the angular relation of the shafts 16 and 26, and hence upon the separation between the upper feed wheel 14 and the lower feed wheel 24, as determined by the thickness of the particular portion of the sole which is between the feed wheels. When the rolls are separated by the forepart portion T of the sole, then an electromagnetic device, such as a solenoid 60, is energized to pull the gaging mechanism 40 about its pivot point 46 against the tension of a leaf spring 62. The plunger of this solenoid 60 is connected to the gaging mechanism by a link 64, and the arrangement is such that the solenoid is energized through a switch 66 supported upon an arm 68 depending from the fixed arm 18 in which the upper feed wheel shaft 16 is journaled. This switch 66, which is pivotally mounted on a pin 70 extending between arms formed at the lower end of the bracket 68, is preferably of the micro-matic type so that the resilient switch blade 72 (Fig. 3) is moved to a closed position by a very small movement of an operating button 74. The box containing the switch 66 rests against a buffer spring 76, and movement of the box clockwise is limited by a pin 77 bridging the bracket arms mentioned above. The button 74 is operated by a bell crank 78 having a contact screw 80 adjustable for runs of work which are heavy or light. This bell crank 78 is swung counterclockwise as viewed in Figs. 1 and 3, by a finger 82 depending from the lower pivoted arm 28 in which the shaft 26 of the lower feed wheel 24 is journaled.

Whenever a thinner portion less than a predetermined thickness, such as the reduced portions R, is measured by the sensing device, then the finger 82 will fail to press against the bell crank 78 sufficiently to close the switch 66 and the gaging mechanism will be rotated around its pivot 46 by the leaf spring 62 to a position indicated in dotted lines in Fig. 4, where the cross-feed component of the feeding force F will be reduced to a magnitude C, and the advancing component increased to a value D.

By this mechanism, the action of which has already been described, the cross-feed component imparted by the feeding mechanism is varied in accordance with the thickness of the por-

tion of the sole being treated, to the end that thinner portions of the sole will be forced less vigorously against the abutment provided by the gaging mechanism 40 than will be the thicker portions.

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 operating upon work pieces, a device engaging the periphery of the work piece, a device engaging a marginal portion of one face of the work piece, one of said devices being constructed and arranged to apply a force acting to advance the work piece and to swing it laterally, a sensing device responsive to changes in thickness of the marginal portion of the work piece, and means connected to said sensing device controlling the force component by means of which the work piece is swung laterally as it is advanced.

2. In a shoe-sole treating machine, a device engaging the periphery of the sole, a device engaging a marginal portion of one face of the sole, one of said devices being constructed and arranged to apply a force one component of which will advance the sole and another component of which will swing the sole laterally toward the other device, a sensing device responsive to changes in thickness of the marginal portion of the sole, and means connected to said sensing device controlling that component of the force by which the sole is swung laterally as it is advanced.

3. In a shoe-sole treating machine, a sole-edge engaging device, sole-advancing mechanism having a cross-feed component operative to hold the sole against said device as it is advanced, a sensing device responsive to variations in the thickness of successive portions of the sole, and electromagnetic means controlled by said sensing device for varying said cross-feed component.

4. In a shoe-part treating machine, mechanism for treating a peripheral portion of a shoe part having an irregular outline, shoe-part feeding and guiding mechanism operating continuously to exert a force having a cross-feed component directed toward the guiding portion of said mechanism, and movable means responsive to variations in a physical characteristic of said shoe part constructed and arranged to shift the relation of the parts of one of said mechanisms, thereby to alter the cross-feed component of the feeding force in accordance with changes in said physical characteristic.

5. In a shoe-sole treating machine, mechanism, including an abutment, to determine a line of feed, sole-feeding mechanism operating in a direction angularly related to the line of feed, thereby to produce a feeding effect having a cross-feed component, and mechanism, responsive only to a change between predetermined adjacent values each greater than zero in the thickness of said sole, for moving one of said mechanisms to vary said cross-feed component.

6. In a shoe-sole treating machine, mechanism for treating a peripheral portion of a shoe sole, gaging mechanism cooperating with the periphery of said sole, sole-feeding mechanism exerting a force having a cross-feed component toward the gaging mechanism, and thickness-measuring mechanism, responsive only to a diminution in the thickness of the sole beyond a predetermined thickness intermediate between the maximum thickness and zero, constructed and arranged to

vary the action of one of said mechanisms, thereby to lessen the cross-feed component.

7. In a sole-treating machine, an operating tool acting upon a margin of the sole adjacent to its periphery, spaced gage-contact-points arranged to contact with the periphery of the sole, one of said gage-points being movable, coacting feed rolls engaging the upper and lower surfaces of the sole and having a cross-feeding action, one of said rolls being movable toward and away from the other, and means responsive to movement of said feed roll for controlling the position of the movable gage, thereby to vary the cross-feed in accordance with changes in thickness between successive portions of the sole.

8. In a sole-treating machine, an operating tool arranged for cooperation with a peripheral portion of the sole, feed elements comprising wheels engaging the upper and lower surfaces of the sole, means for supporting said wheels permitting at least one wheel to move toward and away from the other, gage elements comprising contact points spaced to engage successive points along the periphery of the sole, one of said gage-points being bodily movable with respect to said feed elements, and means responsive to the relative movement between two of said relatively movable sole-engaging elements controlling the movement of a third sole-engaging element.

9. In a shoe-sole treating machine, a sole-

treating tool, spaced gaging elements coacting with the periphery of the sole at successive points thereon, feed-wheel elements moving the sole past said gaging elements and operating in a direction angularly related to a line connecting said gaging elements, and means responsive to variations in thickness of the sole for controlling the angular relation between said two sets of elements.

10. In a shoe-sole treating machine, a treating tool, feed wheels engaging the opposite surfaces of a substantially horizontally positioned sole, at least one of said feed wheels being mounted for relative bodily movement toward and away from the other in response to variations in the thickness of the sole, a gage-point coacting with the periphery of the sole forward of said feed wheels considered with respect to the direction of feeding movement of the work, a gage-point coacting with the periphery of the sole to the rear of said feed wheels, a line between said points being disposed at an angle to the plane of the end surface of a feed wheel, thereby to produce a cross-feed, said rear gage point being mounted for movement laterally with respect to said end surface, and means responsive to the separation of the feed wheels by the work for moving said movable gage point to control the cross-feed effect.

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