

Sept. 1, 1942.

W. L. MacKENZIE
SOLE MARGIN CEMENTER
Filed April 12, 1941

2,294,472

2 Sheets-Sheet 1

Fig.1

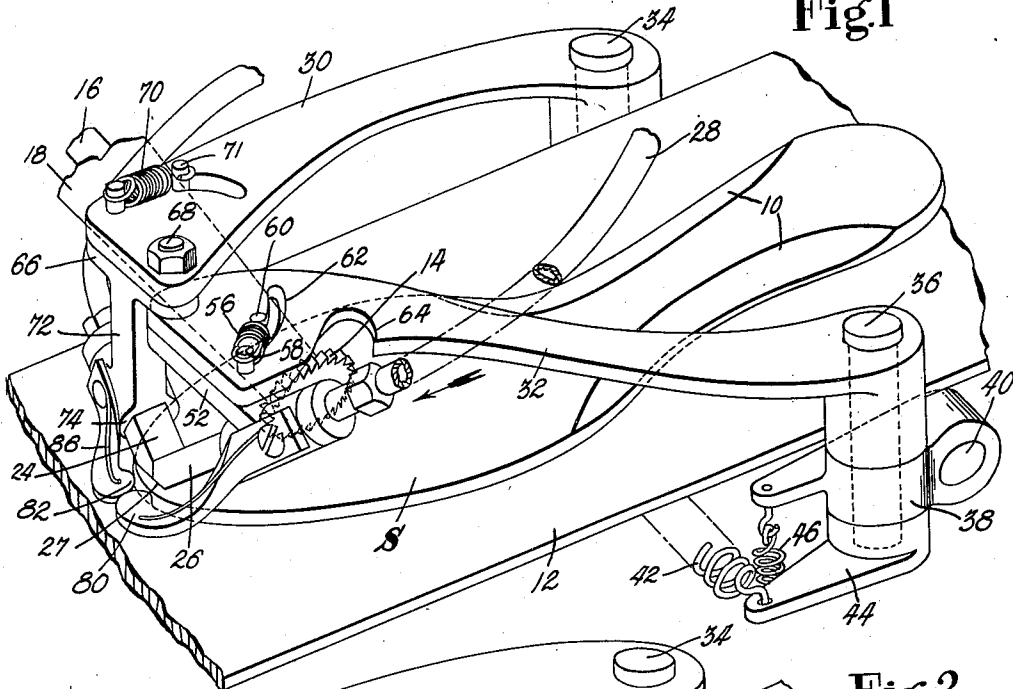


Fig. 2

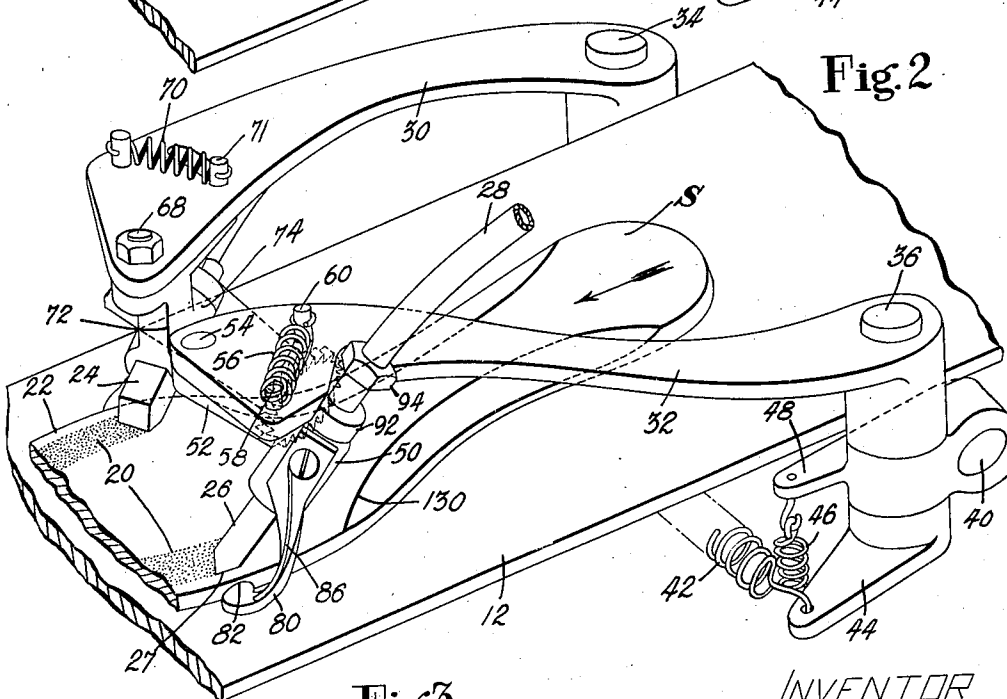
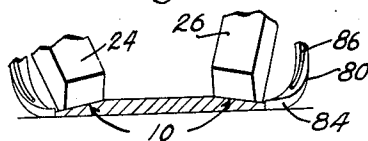


Fig.3



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2 Sheets-Sheet 2

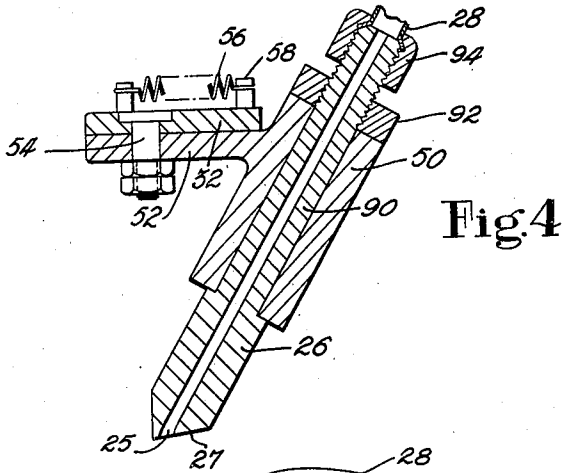


Fig.4

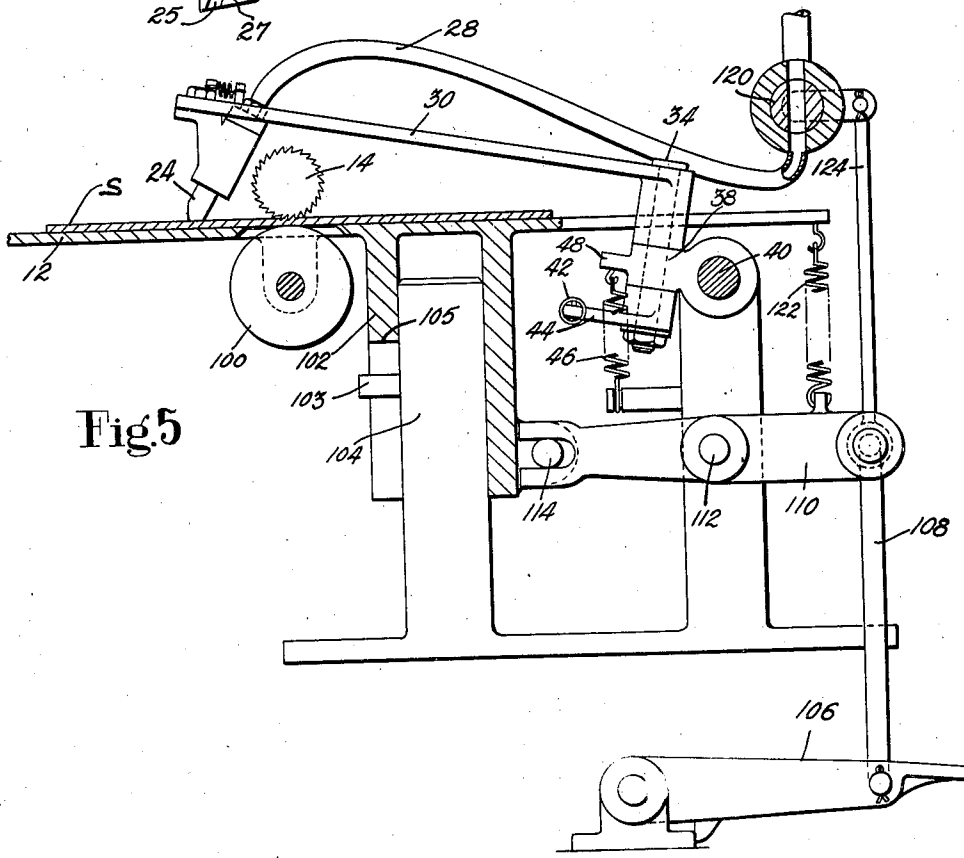


Fig.5

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UNITED STATES PATENT OFFICE

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SOLE MARGIN CEMENTER

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17 Claims. (Cl. 12—80)

This invention relates to machines for applying a marginal stripe of adhesive to shoe soles and is herein illustrated as embodied in a machine of the type in which opposite margins are coated simultaneously.

In the construction of shoes in which the soles are to be permanently attached by means of a marginal band of adhesive, such as a cement of the pyroxylin type, it is customary to apply the stripe of cement progressively by means of an applying member which occupies a position relatively fixed with respect to the machine and to guide the sole margin past said applying member. Machines are in extensive use in which the presentation of the sole margin to the applying member is substantially automatic and in which the progressive movement of the sole is accomplished by a feed wheel coacting with the margin which is to be coated. When the contour of the soles is such that the toes are quite pointed, then the feeding and guiding operation becomes somewhat more difficult and there is a danger of digging up the margin of the sole more than is desired if the feeding mechanism is to be operated successfully to hold the sole against guides so that the applied stripe will occupy just the desired relation to the peripheral edge of the sole.

Accordingly, an important object of the invention is to provide an improved machine for coating the margins of shoe soles, by means of which production may be increased, the cement more evenly applied, and the difficulties mentioned above overcome.

By providing two applying members which coact simultaneously with the opposite margins of the sole, it is possible greatly to increase the production and still keep the relative speed between the sole and the applying member as low or lower than has been necessary for a good coating when a single applying member was utilized. As herein illustrated, a sole is moved past the applying members by a feeding mechanism arranged to engage the mid portion of the sole and to move it in a longitudinal direction. These applying members are mounted upon supports movable transversely of the direction of feed so that they will cooperate with the respective curved margins. In accordance with one important feature of the invention, the supports for the applying members permit movement both transversely of the direction of feeding movement and heightwise with respect to the surface of the sole thereby accommodating soles of various thicknesses and facilitating the coating of the reduced portions of the sole.

If the coating applying members are to be arranged to coat completely across the toe end of the shoe sole, it is necessary that they should be brought close together prior to the introduction of the sole and then separated as the longitudinal feeding movement takes place. To this end, in the illustrated machine, in which the applying members are coating nozzles inclined to the surface of the work and arranged to apply marginal stripes of cement, nozzle carriers are provided which are swingable upon their supports around axes extending heightwise thereof and are biased to a position in which the nozzles are end to end prior to the introduction of a sole. Associated with these nozzle carriers, are sole-edge-engaging guides which are operative to swing the carriers to guide the nozzles along the respective margins of the soles thereby to apply marginal stripes in just the desired relation to the edge, i. e., usually slightly spaced from the peripheral edge to leave a clean uncoated margin between the stripe and the periphery.

In accordance with still other features of the invention, the illustrated inclined nozzles have substantially flat sole-engaging ends and are pivoted in the carriers on their own axes so that they can tilt to coat the reduced shank portions. To still further facilitate this part of the operation, the pivotal movement of the carriers is limited so that the nozzle ends will be in a position in which they can easily ride from the flat forepart of the sole into the shank reductions. Furthermore, the sole-edge-engaging guides, which are shown as rigidly attached to the nozzle carriers, have portions engaging the periphery of the sole and also resting on the sole support. With this in mind, provision is made for relative, heightwise yielding between the delivery ends of the nozzles and the guides as variations in thickness of the sole occur.

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

Fig. 1 is an angular view of the machine showing the nozzles at the toe end of a sole;

Fig. 2 is a similar view but with the nozzles coacting with the forepart of the sole near the ball line;

Fig. 3 is a detail view, along a plane normal to the shank portion of the sole, of the ends of the nozzles and the sole guides showing their coaction with the reduced shank portions;

Fig. 4 is a section on a larger scale taken along the axis of a nozzle; and

Fig. 5 is a vertical section taken longitudinally of the sole support and illustrating a treadle mechanism for raising a sole and its support to start the feeding action.

A sole S having a reduced shank portion providing inclined surfaces 19 is illustrated as positioned upon a sole support 12 and the arrangement is such that the sole is fed in a substantially rectilinear path, indicated by the arrows in Figs. 1 and 2, by means of a driven feed wheel 14 mounted on a shaft 16 which is journaled in a suitable support 18. This feed wheel engages the median portion of the sole so that there is no possibility of unduly scuffing the marginal portion thereof where the stripes of cement 20 are to be applied. In the drawings, these stripes of cement have been laid upon the marginal portion of the sole in such a way that a clean margin 22 is provided as is usually desired.

The application of these marginal stripes of cement 20 is effected by means of a pair of nozzles 24, 26 each of which is provided with a substantially flat work-contacting surface 27 provided with an outlet slot 25, or other desired opening, by means of which a marginal stripe 20 may be applied. The nozzles are supplied through flexible tubes 28 from a suitable source of supply, not shown.

At the beginning of the operation, the nozzles are arranged end to end, as shown in Fig. 1, so that the stripe of cement at the toe end will be substantially continuous. The nozzles are carried by movable supports in the form of arms 30, 32, the outer end of each of which moves in a flat arc transversely of the path of movement of the sole. These arms are mounted for swinging movement with substantially vertical pins 34, 36 carried by bearing members 38 which themselves are mounted to turn upon the horizontal axis of a crossrod 40 carried on the frame of the machine. Movement of the arms to carry the nozzles toward each other is effected by a spring 42 interconnecting short arms 44 which are secured to the lower ends of pins 34, 36. The nozzles are urged downwardly into contact with the surface of the work by means of springs 46 which are attached to lugs 48 integral with the bearing members 38. The lower ends of these springs are connected to any suitable fixed member such as the frame of the machine.

Each of the nozzles is supported in a carrier upon the end of one of the arms 30, 32. The nozzle 26, for example, passes through a sleeve 50 (Fig. 4) at the outer end of a carrier 52 which is swiveled upon an upright stud 54 at the outer end of the arm 32. This carrier is biased to the position shown in Fig. 1 by means of a spring 56 interconnecting a pin 58 upon the arm 32 and a pin 60 upon the carrier 52. This pin 60 passes up through a slot 62 in the swinging arm 32. This arm 32 has a recess 64 to receive the upper end of the nozzle parts and permit swinging of the nozzle in a manner, to be described, to an extent which will be limited by the end of the slot 62. A similar mounting of the nozzle 24 is provided at the outer end of the arm 30 which is at a higher level than the arm 32 to avoid interference when the arms are in the position illustrated in Fig. 1. To this end, a carrier 66 is pivoted upon a stud 68 in the arm 30 and is biased by a spring 70 attached to a stud 71 and operating in a manner similar to that employed for biasing the carrier 52. The carrier 66 has a depending shank 72 at the lower end of which is a sleeve 74 for the reception of the nozzle 24.

The positions of these nozzles with respect to the margins of the sole S are determined by similar guides 80 attached by screws to the carrier sleeves 50 and 74. Each guide has a rounded end 82 which bears against the periphery of the sole and which is formed upon an inturned, substantially horizontal portion 84 (Fig. 3) which rides upon the surface of the sole support 12. Inasmuch as there is a change in the heightwise relationship between the flat ends 27 of these nozzles and the guides 80 in passing from the forepart to the reduced shank portions 19, the guides are arranged to flex heightwise slightly and are reinforced by wire springs 86.

To enable the work-contacting ends 27 of the nozzles to tilt when the cement is to be applied to the surfaces 19 of the reduced shank portions, these nozzles are each swiveled in the respective sleeves 50, 74 of their carriers, in the manner illustrated in section in Fig. 4. To this end, each nozzle has a reduced bearing portion 90 which is journaled in the corresponding sleeve 50, 74 and is held against heightwise movement in this obliquely positioned sleeve by a shoulder engaging the lower end of the sleeve and by a nut 92 engaging the upper end of the sleeve. The supply tubes 28 through which cement is supplied to the nozzles are secured thereto by clamp nuts 94.

In order to reduce the friction between the sole and its support 12, an idle supporting roll 109 projecting through an opening in the support is journaled on the under side thereof directly under the feed wheel 14, as shown in Fig. 5. The sole support 12 has a depending hub 102 which is slidable vertically upon a standard 104 forming a part of the frame of the machine and this support may be raised by the depression of a treadle 106 having a treadle rod 108 connected to a lever 110 fulcrumed upon the frame of the machine at 112 and pivotally connected at 114 to said hub 102. The depression of this treadle 106 is also utilized to open a valve 120 interpositioned between a source of supply (not shown) and the tubes 28 leading to the nozzles. The valve 120, normally biased to a closed position by means of a spring 122, is joined to the treadle lever 110 by means of a rod 124.

When, in the operation of the machine, the toe end of a sole contacts the guides 80 in the position shown in Fig. 1, it causes the carriers 52, 66 to swivel upon their vertical studs 54, 68. This action proceeds until the pins 60, 71 attached to the carriers reach the ends of the slots in the supporting arms, and this turning of the carriers takes place against the tension of the springs 56 and 70. When the pins reach the ends of the slots, the carrier arms 30, 32 will begin to separate against the tension of the transverse spring 42 and the ends 82 of the guides will ride along the sides of the sole, causing the application of the stripes of cement 20 slightly within the periphery. The design of the slots 62 is such that the outlet ends of the nozzles are positioned upon lines substantially parallel to the shoulders 130 at the beginning of the reduced shank portions. They are, therefore, in a most favorable position to drop into this reduced shank portion under the tension provided by the springs 46 which acts continually to hold the nozzles against the upper surface of the sole. Downward motion of the sole support 12 under the action of the treadle 107 is limited by engagement of a pin 103 with a slot 105. As the shank portions are coated, the nozzles tilt in their supporting sleeves 50, 74 to

the positions shown in Fig. 3. At this time too, the lower ends 34 of the guides have flexed slightly, if necessary, to permit the nozzles to drop firmly into contact with these inclined surfaces 10. When the coating has proceeded to a point slightly beyond the heel breast line, the operator will release the treadle 106 permitting the sole support 12 to carry the sole down out of engagement with the feed wheel 14 and the nozzles, to which the supply of cement will have been cut off by the valve 120, will return to the position illustrated in Fig. 1, ready for the presentation of another sole.

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 coating the margins of shoe soles, a support for a sole, coating applying members, supports for said applying members movable toward and away from each other to permit the applying members to follow the contour of a sole moved between them, and a mounting for said movable supports constructed and arranged to permit heightwise movement of the applying members with respect to said sole support.

2. In a coating machine, a coating member adapted to apply a stripe to the margin of an article of irregular contour and having an uneven surface, means for supporting said coating means constructed and arranged to permit swinging movement of the coating means about axes which are angularly related to one another thereby to permit the coating means to follow the irregular contour of the article by swinging about one axis and to follow the irregular surface of the article by swinging about the other axis.

3. In a machine for coating the margins of shoe soles, a coating member, means for producing relative movement between a sole and said coating member, and means for swingably supporting said coating member for movement about an axis substantially normal to the surface of the sole thereby to facilitate following the margin of the sole and for also permitting swinging movement of the coating member about an axis more nearly parallel to the surface of the sole than the first axis and permitting swinging movement of the coating member to follow the irregular surface of the sole.

4. In a machine for coating the margins of shoe soles, a coating applying member, a sole support over which a sole may be moved to present successive portions of the margin to said applying member, a support for said applying member movable transversely of the path of movement of said sole, a sole edge guide for controlling the movement of the applying member with respect to the sole, a guide carrier swingably mounted on said movable support, and means for biasing said guide member to a position transverse to the path of movement of the sole.

5. In a coating machine for sole margins, a sole support, nozzles having sole edge guides, movable supports for said nozzles arranged to hold the guides in contact with the edges of the sole, nozzle carriers pivoted on said supports, and biasing means for said carriers arranged to bring the nozzles substantially together at the toe end of the sole.

6. In a machine for coating the margins of shoe soles, coating nozzles arranged to act simultaneously upon the opposite margins of a sole, a sole support over which a sole may be moved to present successive portions of said margins to said

nozzles, supports movable transversely of the sole support, nozzle carriers pivoted on said movable support to a position where said nozzles are end to end prior to the passage of a sole thereunder, and means for swinging said nozzle carriers to cause the nozzles to follow the margin of a sole given a substantially rectilinear movement along said sole support.

7. In a machine for coating the margins of a sole, coating nozzles, a sole support, means for moving a sole over said support in a line passing between said nozzles, supports mounted for movement transversely of said line and heightwise of the sole support, nozzle carriers swiveled on said movable supports, and sole edge guides connected to said nozzle carriers to cause them to swivel in accordance with the contour of a sole moved between them.

8. In a machine for coating the margins of shoe soles, a coating nozzle, a sole support over which a sole may be moved to present successive portions of the margin to said nozzle, a swinging arm, a nozzle carrier pivotally mounted on said arm, and means for limiting the swinging movement of said nozzle carrier with respect to the arm as relative movement is produced between the sole and the nozzle to coat the margin of the sole.

9. In a machine for coating the margins of shoe soles, a coating nozzle, a sole support over which a sole may be moved to present successive portions of the margin to said nozzle, an arm carrying said nozzle and mounted for swinging movement about axes substantially normal to the sole support and substantially parallel thereto, means for holding the nozzle in contact with the surface of the sole, a sole edge guide on the arm, and means for holding said guide in contact with the edge of the sole as the coating progresses.

10. In a machine for coating the margins of shoe soles, a sole support, applying members adapted to coat the opposite margins on one face of a sole on the support as relative movement is produced between the sole and the applying members, swingable arms carrying said applying members and pivoted upon axes substantially normal to the work support, sole edge guides for the applying members, resilient means urging said arms toward one another to keep the guides in contact with the edges of the sole, said arms being mounted for movement toward and away from the work support, and resilient means for moving the arms to hold the applying members in contact with the surface of the sole.

11. In a machine for coating the margins of shoe soles, sole feeding mechanism, a coating nozzle having a substantially flat end, and a support to hold said nozzle oblique to the surface of the sole with its flat end in contact therewith, said nozzle being pivotally mounted in said support for tilting movement to permit the end of the nozzle to follow irregularities in the surface of the sole, such as the reduced shank portion thereof.

12. In a machine for coating the margins of shoe soles, a sole support, nozzles having sole edge guides, movable supports for said nozzles arranged to hold the guides in contact with the edge of the sole, and nozzle carriers on said supports pivoted about axes normal to the surface of the sole support, said nozzles being pivotally mounted in said carriers thereby to permit the nozzles to tilt to accommodate variations in the surface of the sole,

13. In a machine for coating the margins of shoe soles, a sole support, means for moving a sole over said support, a coating nozzle, a support for said nozzle movable transversely above the sole support, and a sole-edge-engaging guide mounted on said nozzle support for movement with the nozzle and to yield to permit relative heightwise movement between the work-contacting end of said nozzle and the sole-edge-engaging end of said guide.

14. In a machine for coating the margins of shoe soles, a coating nozzle, a sole support over which a sole may be moved to present successive portions of its margin to said coating nozzle, a support for the nozzle mounted for movement substantially parallel to the surface of said sole support, a guide connected to said nozzle arranged to contact with the edge of a sole and to ride on the surface of said sole support, said guide being yieldable to permit relative heightwise movement between the work-contacting end of the nozzle and the end of the guide.

15. In a machine for coating the margins of shoe soles, nozzles for simultaneously applying stripes of coating material to the opposite margins of the flesh surface of a sole, a sole support, feeding means for moving the sole along the support to permit the nozzles to coact with successive portions of the opposite margins thereof, supports movable toward and away from the sides of a sole, nozzle carriers pivoted upon said supports about upright axes, guides on the carriers coacting with the edges of a sole for swinging said carriers as the sole moves between them,

and means for producing relative movement between the sole support and the nozzle supports to hold the nozzles in contact with the surface of a sole being coated.

5 16. In a machine for coating the margins of shoe soles, a sole support mounted for heightwise movement, a feed wheel for engagement with the mid portion of a sole on said support to impart linear movement thereto substantially longitudinal of said sole, coating applying members for coaction with the opposite margins of a sole on the support, and supports for said applying members arranged for movement toward one another transversely of the path of movement of the sole and for heightwise yielding movement to accommodate variations in the thickness of the sole.

10 17. In a machine for coating the margins of shoe soles, a sole support mounted for heightwise movement, a feed wheel for engagement with the mid portion of a sole on said support to impart linear movement thereto substantially longitudinal of said sole, coating applying members for coaction with the opposite margins of a sole on the support, supports for said applying members arranged for movement toward one another transversely of the path of movement of the sole and for heightwise yielding movement to accommodate variations in the thickness of the sole, and operator-controlled means for raising said sole support to press a sole thereon against said feed wheel.

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