July 18, 1944. W. L. MacKENZIE 2,353,738

SOLE PREPARING MACHINE

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Fig.1.

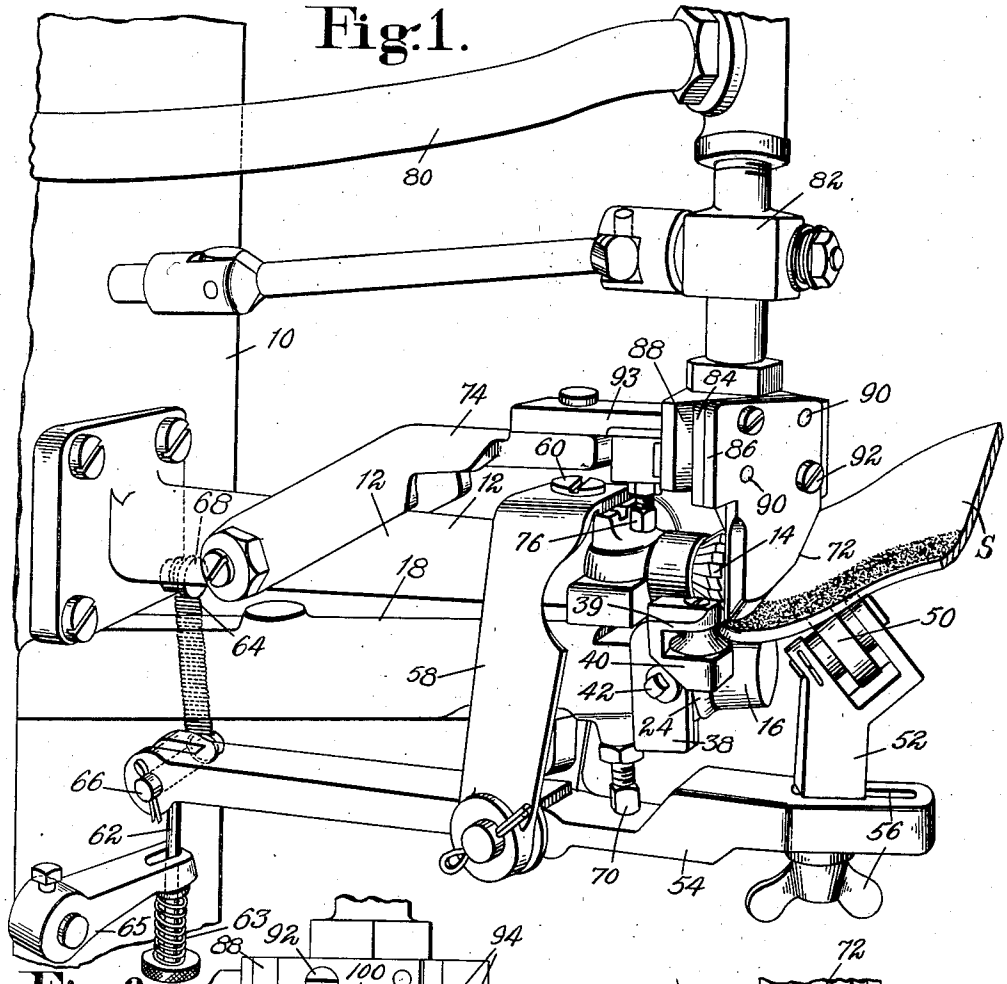


Fig.2.

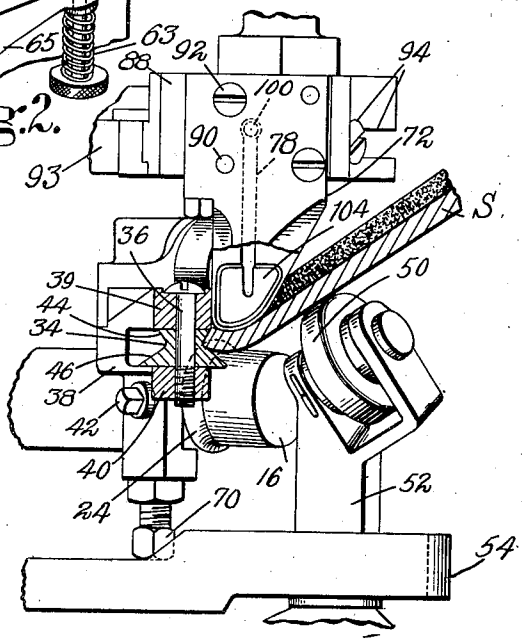
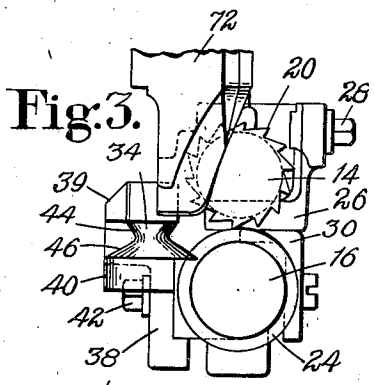


Fig.3.



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Fig. 7.

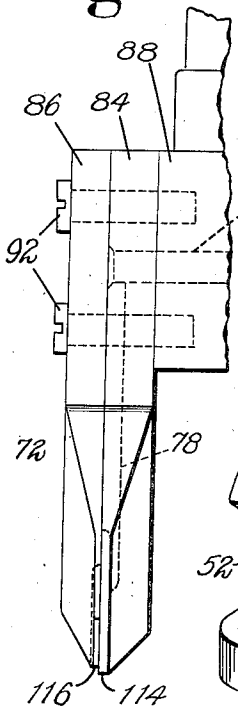


Fig. 9.

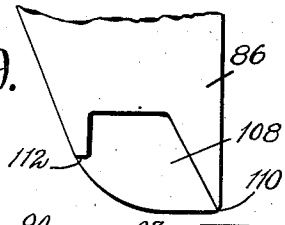


Fig. 8.

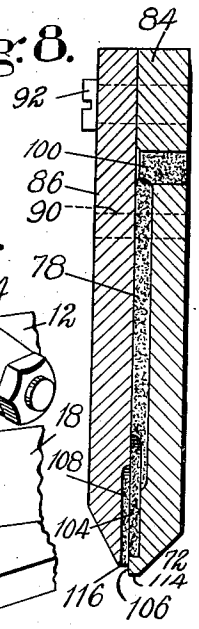


Fig. 4.

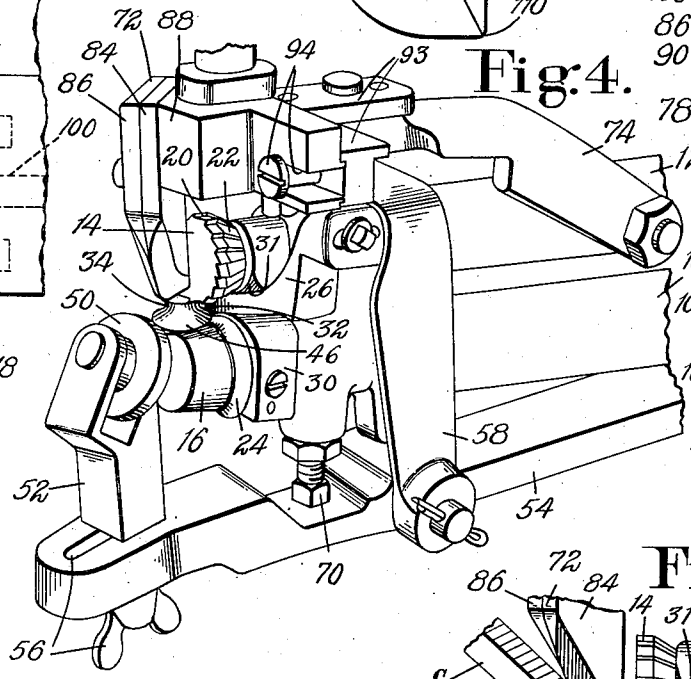


Fig. 5.

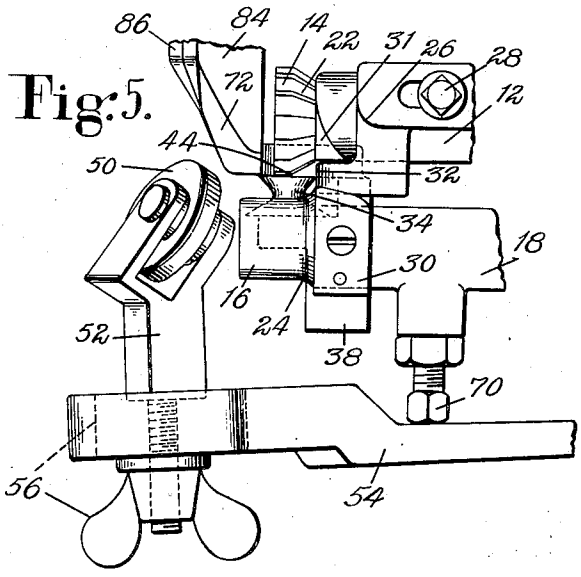
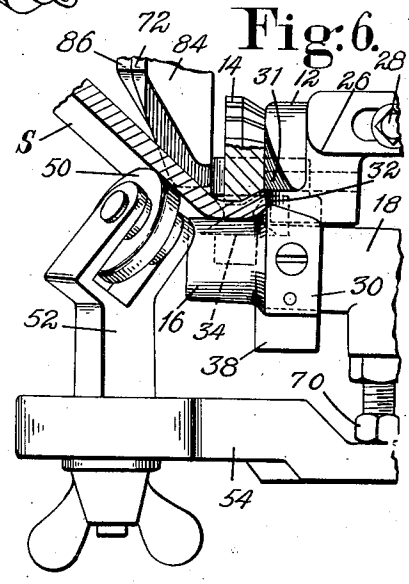


Fig. 6.



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2,353,738

UNITED STATES PATENT OFFICE

2,353,738

SOLE PREPARING MACHINE

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Application January 7, 1943, Serial No. 471,525

6 Claims. (Cl. 12—22)

This invention relates to machines for preparing shoe soles, as by bending or molding the margins thereof and at the same time applying a band of cement, and it constitutes an improved form of the machine for performing the same operation and which is shown in Letters Patent of the United States No. 2,262,047, granted November 11, 1941, upon the application of Walter W. Prue.

Machines of the type under consideration are useful in preparing shoe soles so that the edges thereof hug the bottom of the shoe and do not tend to pull away from the shoe in case of inadequate bonding or too short maintenance of the pressure between the sole and shoe during the bonding operation. By the use of such machines a curvature is imparted to the margin of the sole just prior to the application of cement and in a single handling of the sole so that no additional time is required.

It has been found, however, that the leather in some soles is very soft and pliable and in other soles is quite stiff. With soft soles the tendency of the machines already in use is to bend up the margin of the sole by reason of the pressure induced by the cross-feeding action to an extent such that the surface presented to the nozzle, by means of which cement is applied, may be almost vertical. As a consequence, the continuity and extent of the band of cement applied is imperfect and the inside finger of a nozzle, such as that shown in the Prue patent, which is supposed to coat the outer edge of the band, may contact the sole at widely varying spacings from the edge thereof. It is, furthermore, impractical to carry the band of cement all the way to the edge with such a multifingered nozzle without having the nozzle interfere with the feed mechanism.

One important object of the invention is to provide an improved sole-preparing machine by means of which the band of cement may be carried to the extreme edge of the sole and the action of the machine rendered uniform regardless of the characteristics of the leather used in the sole.

To this end and in accordance with one feature of the invention, the machine is provided, at the leaving side of the sole-bending and feeding mechanism, with a gage roll formed as an inverted cone which will, therefore, contact fully the edge of the bent or molded sole margin and will prevent undue distortion or lateral displacement thereof.

Still another feature of the invention resides in combining with the machine a solid nozzle having a slot extending transversely of the margin of the work and in providing a sole-margin-supporting surface on the gage roll at the leaving side of the machine whereby the molded sole is held in firm contact with the end of the nozzle and a perfect molding and cementing operation completed.

Still other features of the invention are to be found in the provision, in addition to the usual support of the feeding mechanism, of an additional sole-supporting member positioned beneath the body of the sole, together with a treadle-operated lever which serves to raise this sole-supporting member.

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 operating parts of the machine viewed from the side which the work leaves;

Fig. 2 is a detail view, on a larger scale, of some of these parts with the special gage roll and a sole shown in section in the plane of the meeting faces of the nozzle plates;

Fig. 3 is a detail view of the feed rolls and the special gage roll viewed from the end of the machine;

Fig. 4 is an angular view, on the scale of Fig. 1, of the operating parts of the machine viewed from the ingoing side;

Fig. 5 is a front elevation of these parts showing the work-supporting rolls raised;

Fig. 6 is a similar view with a sole in position in the machine;

Fig. 7 is an elevation, on a much larger scale, of the edge face of the nozzle;

Fig. 8 is a vertical section through the nozzle on the scale of Fig. 7; and

Fig. 9 is a detail view, on a still larger scale, showing the inner face of the outside plate of the nozzle.

The invention is herein illustrated as embodied in a machine of the type disclosed in Letters Patent of the United States No. 2,042,479, granted June 2, 1936, upon the application of Carl A. Newhall, and embodies a frame 10 upon which there is rigidly mounted a support 12 in which there is journaled a shaft provided with a toothed upper feed roll 14. Associated with this and beneath it is a work-supporting feed roll 16 mounted on a shaft journaled in a supporting arm 18 which is pivoted within the frame 10 and mounted so that the supporting roll 16 may be lifted to grip the margin of a sole S (Fig. 6) between it and the upper feed roll. This upper

feed roll 14 has peripheral teeth 20 (Fig. 3) extending across a narrow portion of the roll. The inner portion of the roll is tapered inwardly and provided with extensions 22 (Fig. 4) of the teeth. The lower supporting roll 16 will be seen to be provided with a cylindrical body portion and a flanged inner portion 24.

The machine is provided with an adjustable gage 26 at the ingoing or rear side which is held in adjusted position by means of a screw 28 and has a depending portion 30 close to the end of the flange of the supporting roll 16 so that the work may not be caught between the two. The end of the support 12 is cut away at 31 (Fig. 4) to avoid interference with the work. The gage 26 has an inwardly bent portion 32 (Fig. 6) which serves as the point of contact with the sole and it cooperates with a gage roll 34 at the forward or leaving side of the feed rolls, it being understood that these two gages 32 and 34 are so staggered with respect to the axis of the feed roll 14 that a cross feed is set up which forces the sole laterally with respect to the feed rolls and holds it firmly against the gages. The gage 34 is mounted on a screw 36 (Fig. 2) carried in the arms 39, 40 of a bracket 38 and threaded in the lower arm 40. The bracket 38 is attached to the lower supporting arm 18 by means of a screw 42. It will be noted that the gage roll 34 has an upper portion having an inverted frusto-conical surface 44 and a lower portion having an outwardly-flanged frusto-conical surface 46. As a result, the edge of the sole, after the margin has been bent or molded by the coacting feed rolls, comes into firm contact with this upper frusto-conical portion 44 while the lower frusto-conical portion 46 underlies the margin of the sole. Partly because of the cross-feed action above mentioned, the teeth of the feed roll 20 make cuts extending transversely of the margin which so break up the fibers of the leather that the fight is taken out of it. Consequently, there is less tendency for the bent margin to straighten out to its original condition.

Additional means for bending the margin of the sole is provided in a supporting roll 50 which underlies the body of the sole and lifts it upwardly as its margin is gripped between the feed rolls. This supporting roll 50 is journaled in a bracket 52 which is adjustable longitudinally of a lever 54 by reason of a slot-and-screw connection 56. The lever 54 is pivoted in the depending arms of an inverted stirrup 58 held on the rigid support 12 by a screw 60 (Fig. 1). At its inner end the lever arm 54 is resiliently connected through a rod 62 and a spring 63 to a treadle-operated lever 65, and it is normally held in inactive position by means of a tension spring 64 which is joined to the pivot 66, where the rod is connected with the lever, and to one of the screws 68, by means of which the rigid support 12 is mounted upon the arm 10. It will be noted that the pivoted lower arm 18 has an adjustable lifting screw 70 which is positioned for engagement with the lever arm 54 so that depression of the rod 62 is effective both to raise the lower arm 18 and thereby to cause the lower feed roll 16 to grip the work against the upper feed roll 14 and at the same time to raise the supporting roll 50 to tilt up the body of the sole S.

Along with this operation of bending the margin of the sole, it is desired to apply a coating of cement along a marginal band extending, if desired, all the way to the edge of the sole and, to accomplish this, a rigid nozzle 72 is provided which is adjustably supported upon an arm 74 pivoted on the rigid supporting arm 12. The end of the nozzle is curved to approximately the shape of the molded margin of the sole which thus contacts the whole width of the nozzle, receiving a band of cement which is uniform transversely. The lowermost position of this arm and hence of the nozzle is determined by an adjustable stop screw 76 (Fig. 1) engaging the arm 12, and cement is supplied to a groove 78 (Figs. 7 and 8) within the nozzle providing a passage from a pipe 80 (Fig. 1) leading to the receptacle of the machine whenever a valve 82 is opened. The nozzle comprises inner and outer plates 84 and 86 which are held in position on a supporting block 88 (Figs. 4 and 7) by means of dowel pins 90 and attaching screws 92. The groove 78 (Fig. 8) is in the inner plate 84. The nozzle receiving face of the supporting block 88, in horizontal projection, lies along a line slightly back of a perpendicular to the line of feed, as described more in detail in the Newhall patent above mentioned, to the end that a band of cement of uniform width is applied to the sole. The block 88 is adjustably attached to a bracket 93 on the support 74 by a screw-and-slot connection 94 (Fig. 4) so that the plane of the meeting faces of the plates and hence substantially that of the nozzle outlet to be described, may be brought into a position substantially containing the axis of the gage roll 34.

The inner nozzle plate 84, as may be seen in Figs. 7 and 8, has a horizontal passage 100 interconnecting the valve 82 and the depending groove 78 in said plate, which groove extends to a recess 104 in the inner face of the plate. The shape of this recess is shown in Fig. 2 and it is bounded on its lower sides by a narrow marginal surface 106 (Fig. 8) flush with the surface of the plate. Opposing this recess is a shallower recess 108 (Figs. 8 and 9) in the inner face of the outer plate 86. In this outer plate, the recess 108 is open along its bottom side from a point 110 to a point 112, thus forming an outlet slot transversely of the margin of the sole, and the width of the band of cement extruded through the nozzle is determined by the dimensions of this slot. As the work is dragged under the nozzle, the surface 114 at the bottom of the inner plate 84 rides on the surface of the work, and the lower surface 116 of the outer plate 86 acts as a sort of spatula which spreads out the extruded cement and tends to determine the depth of the applied coating. As already noted, the sole margin is held up in firm contact with the curved lower end 114 of the nozzle by the combined action of the lower surface 46 of the gage roll 34 and by the supporting action of the roll 50. As a consequence, the action of the nozzle is regular and the band of cement is uniform, both in width and in depth, throughout the extent of its action around the periphery of the sole. It will be understood that firm contact of the nozzle with the work is necessary to avoid so large a spacing between the two that the cement does not jump from nozzle to sole and produce holidays or uncoated areas. Where the sole is firmly supported by the combined action of the lower conical surface 46 and the roll 50, this cannot occur.

In operation, a sole is presented with its edge in contact with the gaging surface 32, whereupon the treadle is depressed and the rolls 16 and 50 are raised by the action of the lever arm 54. The sole is carried along into contact with the other gage, the roll 34, but, before it reaches that point, the margin of the sole is bent, as

shown in Fig. 1, by the combined action of the feed rolls 14 and 16 and the action of the supporting roll 50.

Accordingly, when the edge of the sole reaches the gage 34, its edge is bent up into a position for firm engagement with the upper inverted cone 44 of that roll while its margin overlies and is supported by the lower frusto-conical portion 46 thereof. Accordingly, firm contact of the work with the nozzle is assured and the latter may be brought to a position, by adjustment of the screw 94 (Fig. 4), to carry the band of cement all the way to the edge of the sole if desired.

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 on shoe soles, feeding mechanism engaging the margin of a sole and constructed and arranged to impart a transverse curvature thereto, and gages associated with said feeding mechanism and so positioned with respect to it that a cross feed is produced, the last-encountered gage comprising an inverted conical member positioned to contact the full width of the edge of the sole.

2. In a machine for operating on shoe soles, coacting driven members engaging the upper and lower margins of a sole to feed it, a support for lifting the body of the sole above the bite of the driven members, thereby to assist in progressively molding its margin, gages associated with said feeding mechanism and so positioned with respect to it that a cross feed is produced, the last-encountered gage comprising an inverted conical portion positioned to contact the full width of the edge of the sole, and an associated upright conical portion to support the upbent margin closely adjacent to the edge.

3. In a machine for operating on shoe soles, coacting driven rolls for progressively imparting a transverse curvature to the margin of a sole as they feed it horizontally, gages staggered with respect to the axis of one of said rolls thereby to impart a cross feed to the sole, and a nozzle contacting the sole adjacent to the last-encountered gage and arranged to apply a coating to the molded margin of the sole, said last-encountered gage having a surface inclined to the horizontal and positioned for engagement with the upturned edge of the sole and another surface underlying the sole and differently inclined, the latter surface being positioned to support the sole closely adjacent to the nozzle.

4. In a machine for operating on shoe soles, coacting driven rolls for feeding a sole and arranged to impart a transverse curvature to the margin thereof, gages to the rear of and forward of said rolls staggered to cause the rolls to impart a cross feed to the sole, and a rigid nozzle having an outlet slot transverse to the margin of the sole and positioned to coat said margin all the way to the edge of the sole, the gage forward of the rolls and adjacent to said nozzle being provided with a portion underlying the margin of the sole to support the latter in firm contact with the nozzle.

5. In a machine for operating on shoe soles, feeding and molding mechanism adapted to operate progressively to impart a transverse curvature to the margin of a sole, means at the leaving side of said mechanism for supporting the margin of the sole, a rigid nozzle having a curved end extending transversely of said margin, and means engaging the body of the sole and coacting with said first-mentioned supporting means thereby to support the sole in engagement with the nozzle across the full width of its margin.

6. In a machine for operating on shoe soles, progressively acting molding mechanism arranged to feed a sole and including gages positioned to the rear of and forward of said mechanism, and a nozzle extending transversely of the margin to coat the margin after it has been molded, that gage which is positioned forward of the feed mechanism comprising a rotatable member having opposed frusto-conical surfaces for engagement with the edge and the margin of the sole respectively.

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