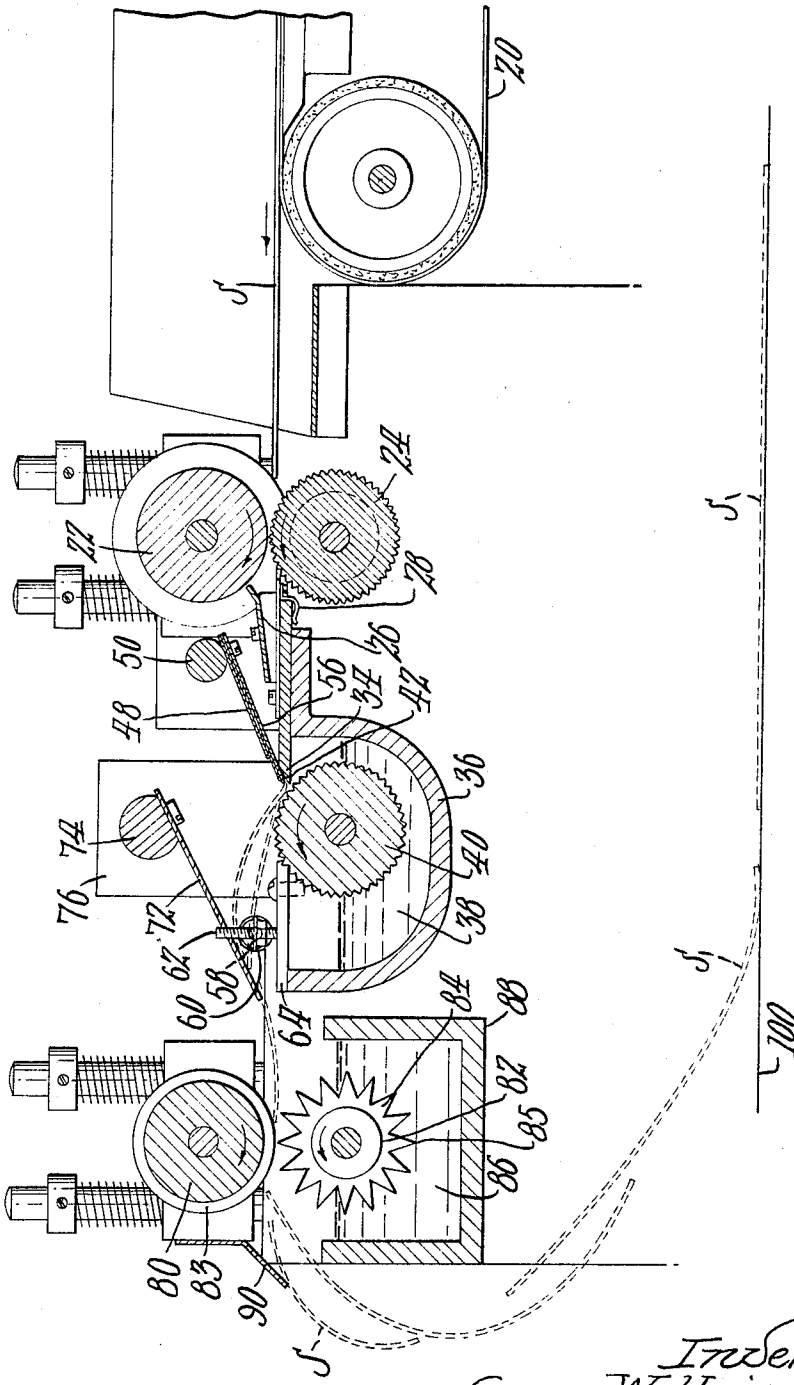
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COATING MECHANISM FOR SKIVED SHOE SOLES

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Fig. 1



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Fig. 2

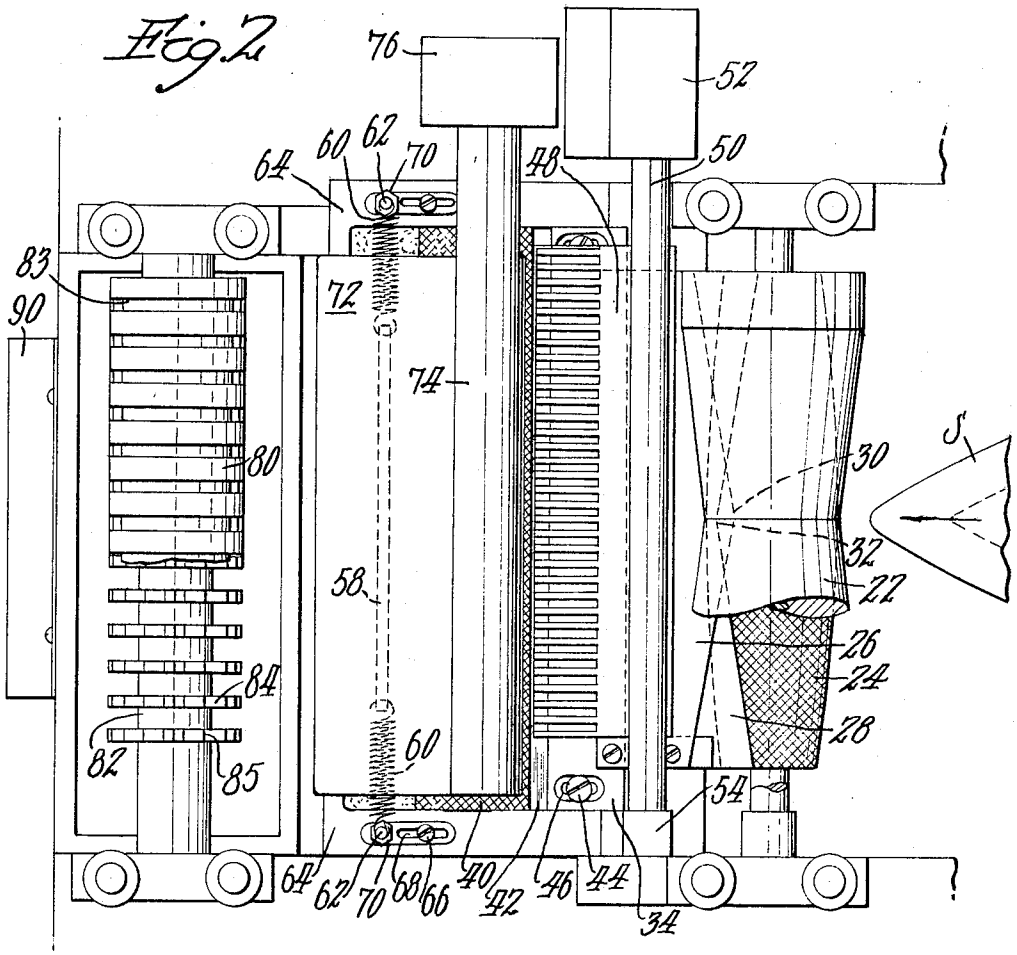


Fig. 3

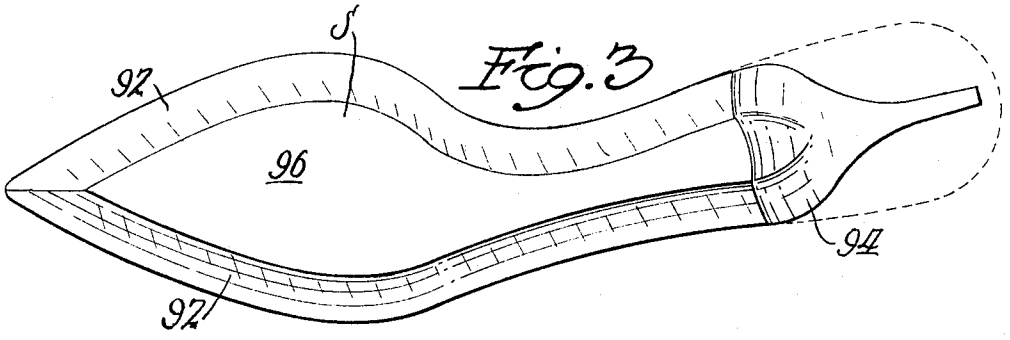
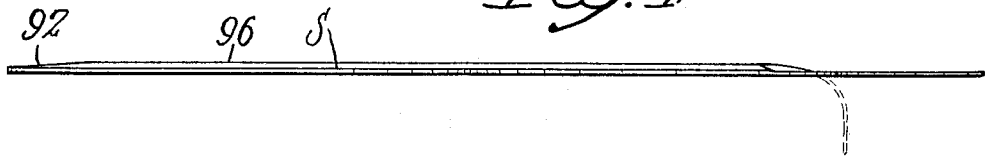


Fig. 4



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Fig. 5

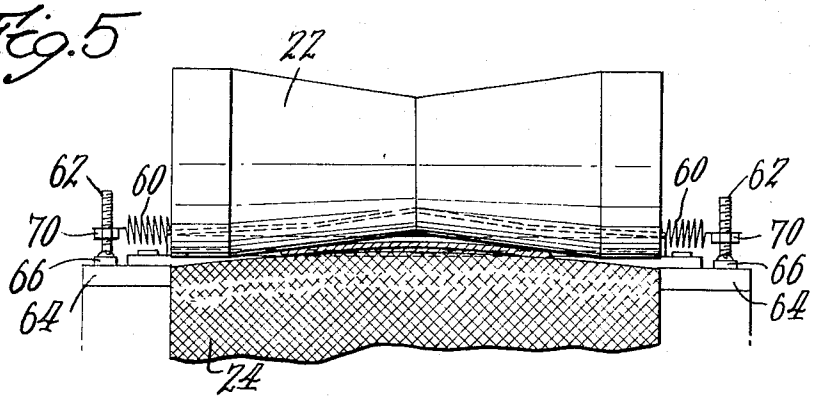


Fig. 6

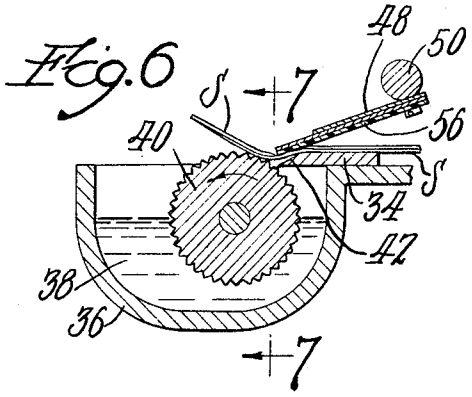


Fig. 7

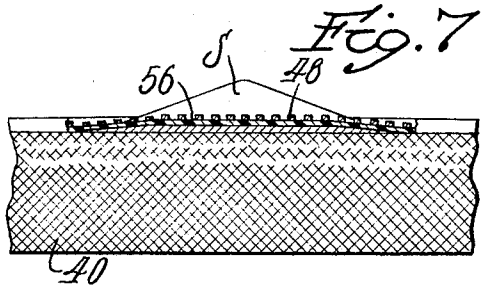


Fig. 8

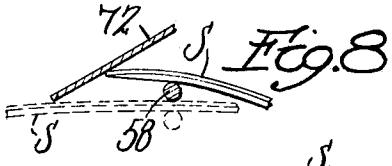


Fig. 9

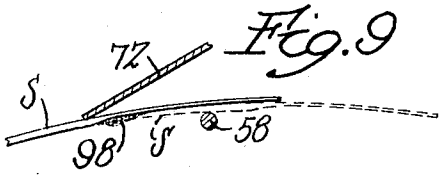
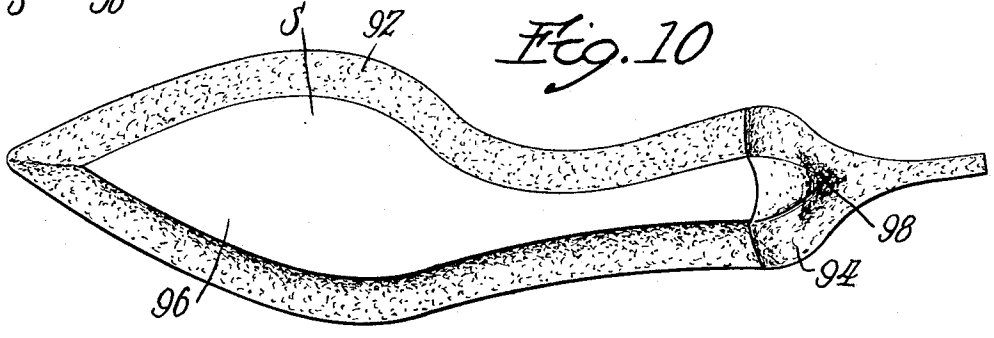


Fig. 10



United States Patent Office 3,288,106 Patented Nov. 29, 1966

3,288,106

COATING MECHANISM FOR SKIVED SHOE SOLES

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Filed Mar. 26, 1964, Ser. No. 354,991
3 Claims. (Cl. 118—100)

This invention relates to a machine for applying liquid cement to a face of a substantially flat flexible object such as a shoe sole. More particularly the machine is designed to apply and distribute liquid cement on a face of an outsole for a lady's shoe having a spike heel, the outsole being made with a heel tab adapted to be cemented to the breast of the heel. A sole of this kind has a skived margin along the side edges usually about half an inch wide. The heel tab is skived over all its area so as to provide a thin surface layer for the breast of the heel. To cement the sole to the upper and heel, a coating of liquid cement is applied to the skived marginal areas and to the heel tab. Heretofore this has been done by two operations, first, the application of cement to the skived margins, and second, the application of cement to the thin heel tab. It is an object of the present invention to apply the cement in one operation and to distribute the cement so that the right quantities will be applied in the right places. The machine hereinafter described includes some of the features of the machine described and illustrated in my copending application Serial No. 181,903, filed March 23, 1962, and now abandoned, but also has additional features which adapt it for the particular job of coating in one operation outsoles with heel tabs for ladies' shoes and for operating reliably on soles made of inferior grades of leather such as those cut from the belly portion of the hide.

For a more complete understanding of the invention, reference may be had to the following description thereof and to the drawings, of which

FIGURE 1 is a sectional view of apparatus embodying the invention, the section being taken on a longitudinal vertical plane;

FIGURE 2 is a plan view of the same;

FIGURE 3 is a plan view of a skived shoe sole having a heel tab;

FIGURE 4 is a side elevational view of the sole;

FIGURE 5 is an end elevation of the machine;

FIGURE 6 is a fragmentary sectional view of the coating roll and adjacent parts;

FIGURE 7 is a fragmentary section on the line 7—7 of FIGURE 6;

FIGURE 8 is a sectional view of a wiper and deflector plate and a portion of a work-piece passing between them;

FIGURE 9 is a sectional view of the parts shown in FIGURE 8 with the trailing heel tab of the work-piece passing between them; and

FIGURE 10 is a plan view of a shoe sole which has been coated by the machine.

The apparatus hereinafter described may be a bench model or may be mounted on a suitable stand. The apparatus includes a suitable base (not shown) on which are mounted the several parts illustrated on the drawing. The work-pieces, which may be soles S for ladies' shoes, are brought to the machine by any suitable means such as by hand or by a conveyor belt 20. The work-pieces are introduced one after the other to the nip between a pair of feed rolls 22 and 24. As indicated in FIGURES 2 and 5, the upper feed roll 22 tapers slightly toward a minimum diameter at its mid point. The lower feed roll 24 in complemental fashion tapers away from its mid point in both dierctions, its maximum diameter being at the mid point. One of these rolls, preferably the lower roll 24, is knurled. The work-pieces S are fed to the feed rolls 22, 24 one

after the other, toe end first, as indicated in FIGURE 2. As some of these work-pieces are apt to come with more or less curling, the shape of the feed rolls 22, 24 is such as to produce a slight transverse arching effect which provides some degree of longitudinal stiffening so that any tendency to curl is reduced or eliminated. As the work-piece passes through the nip of the feed rolls, it enters a "tunnel" formed by an upper guide plate 26 and a lower guide plate 28. The edge of the upper plate which is adjacent to the upper feed roll 22 is shaped to fit the contour of the roll, this edge having a slightly bent-up apex 30 adjacent to the mid point of the roll (FIGURE 2). The lower guide plate 28, which is a stripper plate, has an edge close to the lower roll 24 with a reentrant angle 32 adjacent to the mid point of the lower roll. The tunnel consisting of the plates 26 and 28 is mounted on a table 34 which in turn is mounted on a side of a trough 36 in which is a pool 38 of liquid cement. A knurled coating roll 40 is rotatably mounted on a horizontal axis so as to be partially submerged in the pool 38. As the roll 40 rotates, its surface carries up a film of cement to be deposited on the lower face of each work-piece which is fed to it by the feed rolls 22 and 24 through the tunnel formed by the guide plates 26 and 28. An edge of the table 34 is closely adjacent to the roll 40 below its top level and is adjustable so as to regulate the thickness of the film carried by the roll up into contact with work-pieces which are advanced over the table. The edge of the table 34 adjacent to the coating roll is beveled as indicated at 42 in FIGURE 6 so that its surface slopes downward toward the roll. The clearance between this edge and the surface of the roll 40 can be adjusted by moving the table 34 toward or from the roll, the table being secured by screws 44 passing through slots 46 in the table for this purpose. To direct the work-pieces against the surface of the roll 40 at an angle to such surface so that the work-piece will be flexed sharply upward when it meets the roll, steel spring fingers 48 are carried by an arbor 50 which is adjustably mounted in stationary standards 52 and 54. As indicated in FIGURE 2, the fingers 48 may be formed by notching a single strip of spring steel. Two such sets of spring fingers may be superposed one on the other and a thin strip 56 of a plastic such as "Teflon" may be secured to the arbor 50 to underlie the spring fingers 48. The lower edge of the strip 56 is pressed yieldingly by the spring fingers on the beveled edge 42 of the table 34.

Beyond and a little above the top of the roll 40 is a horizontal rod 58 which acts as a wiper or scraper and is supported by a coil spring 60 at each end, the other end of each spring being caught around a vertical threaded stem 62. These stems rise from a U-shaped plate 64 which rests on three sides of the trough 36 and is adjustably held thereon by screws 66. These screws pass through slots 68 in the plate 64. The rod 58 can thus be adjusted toward or from the coating roll 40. The elevation of the rod 58 is determined by a nut 70 on each of the stems 62. The end of each spring 60 which is caught about the stem 62 bears on the top of the corresponding nut 70. Above the rod 58 is an inclined deflector plate 72 which is secured to an arbor 74 adjustably supported by a standard 76. Beyond this deflector plate 72 are a pair of feed rolls 80 and 82, both of which are driven. The upper roll is a cylinder with spaced circumferential grooves 83 but the lower roll is made up of a series of axially spaced, star-wheel disks 84 which have sharp teeth 85, each disk 84 being opposite a groove 83 so that none of the teeth 85 can touch the upper roll 80. Work-pieces which are advanced by these rolls are touched only at spaced points by the teeth 84 of the lower roll. The slight amounts of liquid cement which adhere to the teeth 85 by their contact with the coated face of the work-pieces passing over this roll are at once dissolved when these

teeth descend into a pool **86** of solvent maintained in a trough **88**, the lower roll **82** being partly submerged in the pool **86**. A second deflector plate **90** is mounted beyond the feed rolls **80** and **82**.

A typical shoe sole for women's shoes is illustrated in FIGURES 3 and 4. This sole S has a skived area **92** about half an inch wide extending from the toe of the sole along both side edges to the heel tab **94**. The heel tab is shaved or split to an abrupt thinness so that it can be used as a covering for the breast of a spike heel, this tab being contoured as indicated in FIGURE 3 for this purpose. It is desired that a substantial film of liquid side edges of the sole and also on the heel tab **94**. Little or no cement is desired on the central area surrounded cement be deposited on the marginal areas **92** along the by the border areas **92**. When a shoe sole S is sent through the machine with its skived face down, the cement deposited thereon is distributed in just this manner. As the toe end of the work-piece is caught by the feed rolls **22** and **24**, the work-piece is advanced and slightly bent transversely so as to stiffen it longitudinally and to reduce any adventitious curling it may have. The tunnel plates **26**, **28** guide the sole to the space between the table **34** and the presser fingers **48**. When the toe of the work-piece is pushed between the fingers **48** and the beveled edge **42** of the table **34**, it is pressed down against the surface of the rotating roll **40**. As indicated in FIGURE 6, contact with the roll bends the work-piece sharply upward with the result that the skived face of the sole is made substantially plane at the line of bend so that the skived margins more effectively engage the surface of the coating roll. As the work-piece travels along, the toe end strikes the under side of the deflector **72** which bends the leading portion of the work-piece down into contact with the rod **58** which acts as a wiper to remove most of the cement from the central area **96** of the work-piece, some of this cement flowing along the wiper rod onto the skived marginal areas **92**, the central area **96** being the area of maximum thickness of the work-piece. As the toe of the work-piece travels beyond the deflector plate **72**, it is picked up by the sharp points **84** of the lower feed roll **82** and carried through the nip of these feed rolls. As these feed rolls pull the work-piece past the spring fingers **48**, the tension on the work-piece causes it to press strongly on the wiper rod **58** to wipe most of the cement coating from the area **96** until the heel end of the work-piece passes from under the fingers. This relieves the tension on the work-piece so that the heel tab **94** either passes clear over the rod **58** or bears on it so lightly that little of the coating of viscous cement thereon is wiped off. Most of the cement which is wiped off the area **96** drips back into the pool **38**, but enough is retained on the rod to deposit a small patch **98** of extra coating on the heel tab **94** as it passes over the wiper rod **58**. This insures sufficient cement where it is needed to attach the heel tab **94** firmly to the breast of the heel, the tab **94** being shaped as shown so that when it is applied to the breast of a heel, no further trimming will be necessary. As the work-piece emerges from the feed rolls **80**, **82**, the toe end is deflected downward by the plate **90** so that when the heel end leaves these rolls the work-piece is inverted and falls with its coated side up on a conveyor **100** or other receptacle.

I claim:

1. A coating machine comprising a container for a pool of liquid, a coating roll rotatable about a horizontal axis mounted in said container, a horizontal table mounted on said container at one side of said roll on a level below the top of said roll, said table having a beveled edge in adjustable proximity to said roll, a series of spring fingers supported above said table and sloping forward and downward at an angle to the surface of the roll and resiliently pressing on said beveled edge whereby a work-piece advancing between the beveled edge and the fingers into contact with the roll is flexed sharply upward at the line of contact, means for feeding work-pieces across said table toward said roll, a sloping deflector mounted above and beyond said roll in position to be engaged by work-pieces flexed upward by said roll, and a horizontal wiper bar yieldingly supported under said deflector in position to be engaged by the coated side of work-pieces passing said deflector.

2. A coating machine as described in claim **1**, and a second feed means beyond said deflector in position to accept and feed work-pieces from said deflector.

3. A coating machine as described in claim **2**, said second feed means consisting of two rolls, one over the other, the upper roll having in its surface a series of spaced circumferential grooves, the lower roll comprising a series of alternate star-wheel disks and spacer disks, the star-wheel disks being directly below respective grooves in the upper roll.

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