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H. J. VACHON ETAL

3,289,631

COATING ROLL

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2 Sheets-Sheet 1

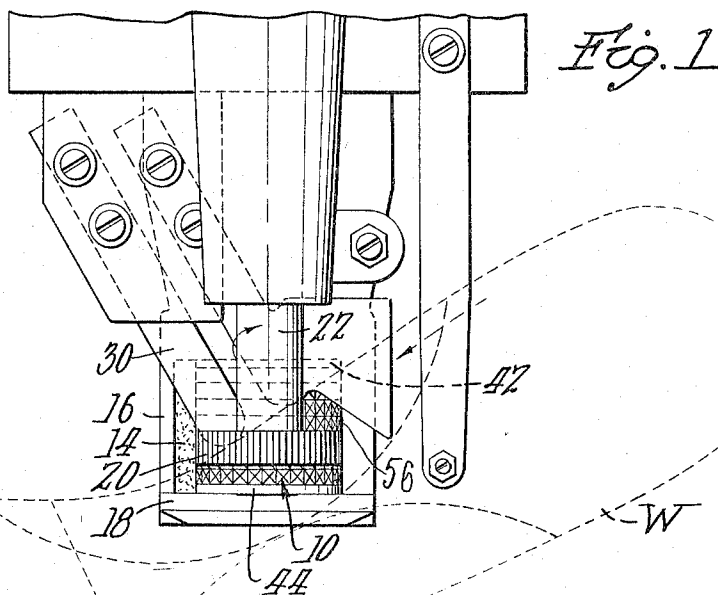
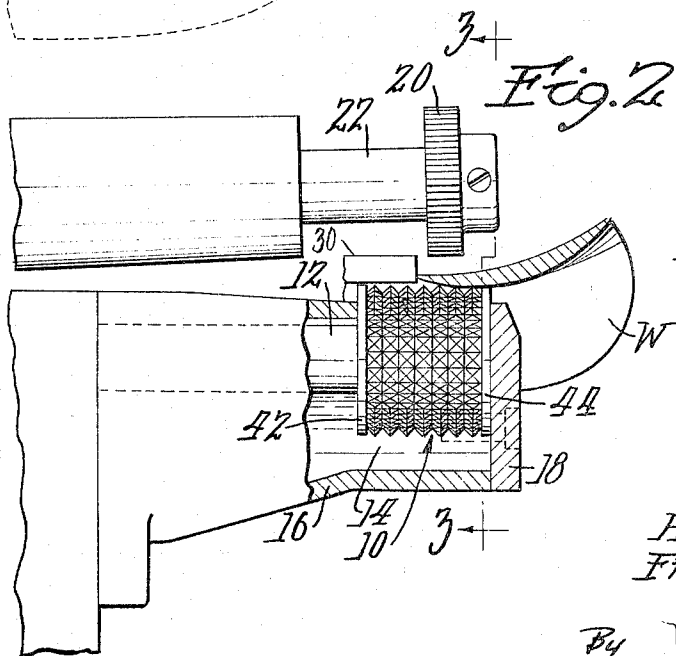
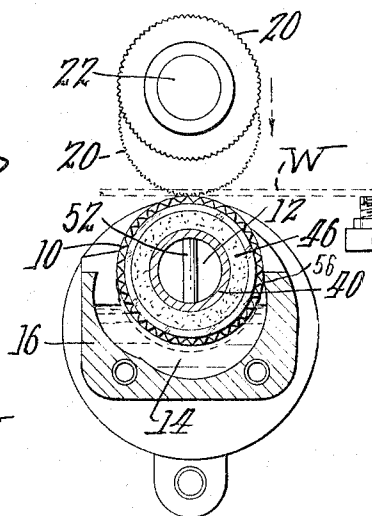


Fig. 3



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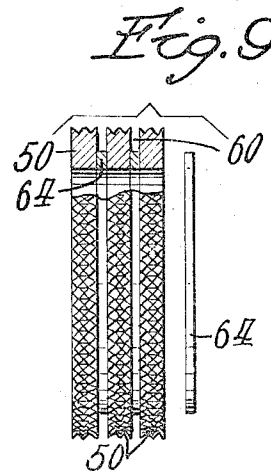
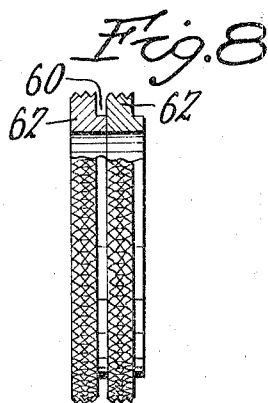
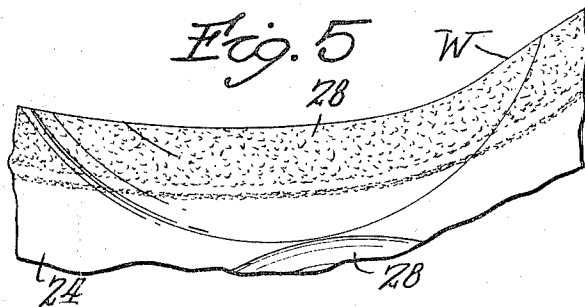
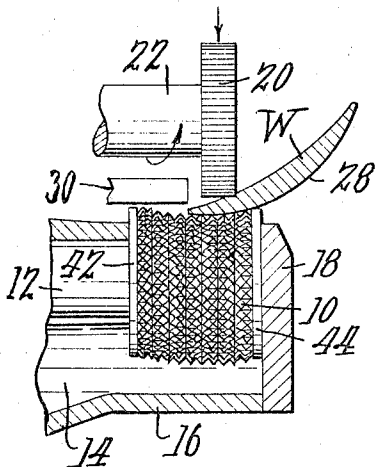
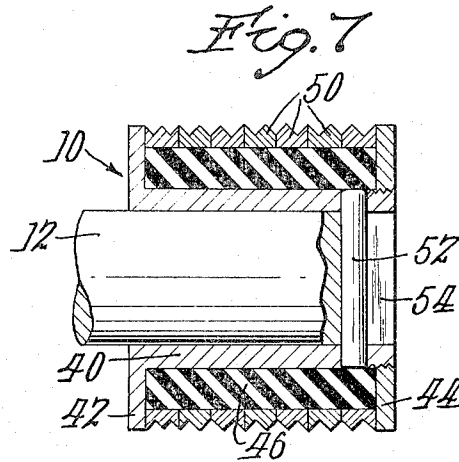
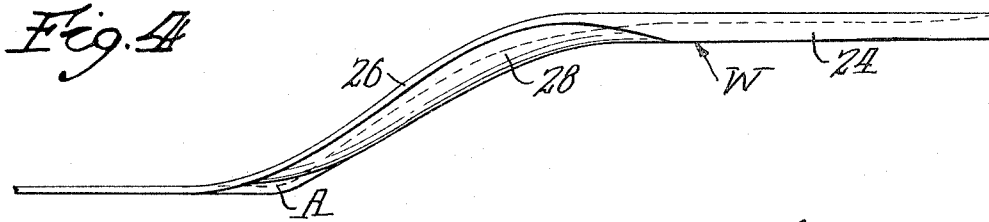
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2 Sheets-Sheet 2



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3,289,631 COATING ROLL

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Company, Lynn, Mass., a corporation of Massachusetts
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1 Claim. (Cl. 118—244)

This invention relates to a coating roll for applying a film of liquid cement to objects having a varying thickness, such as some shoe soles, and more particularly to the margin of an insole the edge of which may vary in thickness from $\frac{1}{32}$ " to $\frac{1}{4}$ " or more. Some types of women's shoes include an insole consisting of a flexible layer of artificial leather extending the full length of the shoe and a rigid member of pressed fiberboard cemented to the under side of the heel and shank portions of the flexible layer. The heel portion of such an insole is the portion of greatest thickness, the shank portion being longitudinally and transversely arched with skived margins resulting in thin side edges. Prior to assembly such insoles with uppers, a band of liquid cement is applied along the entire margin of the bottom face of the insole. This is usually done by means of a knurled roll which is power-driven and which dips into a pool of liquid cement. This is a rapid operation, and difficulty has been experienced in applying a uniform band of cement to the shank portion of the insole, especially where the shank portion meets the ball portion of the insole. According to the invention, a coating roll is provided the surface of which yields locally to pressure, the yielding being resilient. By the use of such a roll, as hereinafter described, the band of cement is applied quickly and uniformly.

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 plan view of coating apparatus including a roll embodying the invention;

FIGURE 2 is an elevational view of the same, a portion being broken away;

FIGURE 3 is a section on the line 3—3 of FIGURE 2;

FIGURE 4 is a fragmentary side elevation of an insole;

FIGURE 5 is a fragmentary plan view of the insole shown in FIGURE 4;

FIGURE 6 is a fragmentary sectional view of the machine showing a roll in operation, the knurling being different from that shown in FIGURE 2;

FIGURE 7 is a sectional view on a larger scale, of the roll shown in FIGURE 6;

FIGURE 8 is an elevational view, partly broken away, of two units of a modified form of roll; and

FIGURE 9 is a partially exploded view of units of another modified form of roll.

The invention is embodied in an improved cementing roll 10 which is adapted to be mounted on a driven shaft 12 in a cementing machine. The roll dips into a pool 14 of liquid cement maintained in a trough 16 by a pump which operates while the shaft 12 is turning. When the machine stops, the cement drains from the trough 16. The end plate 18 of the trough is readily removable to permit a roll 10 to be mounted on the shaft or removed therefrom. Above the roll 10 is a press roll 20 mounted on a driven shaft 22, the rolls 10 and 20 being rotated at equal peripheral speeds during operation. The press roll 20 is normally spaced above the roll 10 but is swung down into operative engagement with a work piece W to press the latter against the roll 10 as the work piece is fed between the rolls by rotation of both rolls. The driving means for the two shafts and the depressing means for the press roll 20 are well known parts of a cementing machine and are not illustrated on the drawings.

The improved cementing roll 10 was developed for the

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purpose of applying a uniform band of liquid cement to the entire margin on the bottom of an insole such as is illustrated in FIGURE 4 of the drawings, part of the ball portion of the insole being broken off to illustrate the remainder of the insole on a larger scale within the boundaries of the drawing. The insole W as shown in FIGURE 4 is a preformed insole ready to be lasted without subsequent forming. This simplifies the lasting operation. The insole consists of two parts, a rigid portion 24 which extends from the rear end of the heel to the forward end of the shank portion of the insole and is overlaid by a relatively flexible layer 26 which is thinner and which extends for the full length of the insole. In shaping the member 24, the shank portion thereof is skived on both margins of its under face as indicated at 28 in FIGURE 5. The shank portion is also transversely curved as indicated in FIGURES 2 and 6.

In practice, an insole W is inserted right side up between the rolls 10 and 20 so that the edge of the insole, preferably at the toe end, bears against a fixed guide finger 30. The roll 20 is then swung down to bear on the margin of the insole and to press it against the coating roll 10, both rolls being driven at equal peripheral speeds. The rolls feed the margin of the insole along as it is guided by the operator and the coating roll 10 brings up cement from the pool 14 and applies it to the under face of the insole W along the margin thereof. When the coating has been applied to the entire margin of the work piece, the roll 20 is raised and the next work piece is inserted against the guide 30. In order to overcome the difficulty which has been experienced in applying a uniform coating of cement to the portions of the margin of the insole where the shank portion meets the ball portion, the roll 10 is made with yielding segments as illustrated, for example, in FIGURE 7. As therein shown, the roll 10 has a hollow cylindrical core 40 adapted to fit on the end portion of the drive shaft 12. The core 40 has end flanges 42 and 44, the latter being preferably removable so that the parts of the roll can be disassembled easily. Between the flanges 42 and 44 a deep layer 46 of soft resilient material, such as sponge rubber, plastic foam, or the like is fitted around the core 40. This soft layer is cylindrical in shape, the outer surface being fitted by a series of rigid rings 50 which are in side to side engagement with each other and with the end flanges 42 and 44. Each ring has a cylindrical inner face fitting against the outer face of the soft layer 46, two parallel plane faces which are in face to face contact with the next adjacent rings, and a knurled circumferential outer surface. When an insole is being operated on and the point A at the juncture of the ball and shank portions of the insole reaches the coating roll 10, the coating roll easily adjusts itself to the sudden change from the relatively thin ball portion of the insole which is uniform in thickness to the relatively thick shank portion of the insole which is skived. This is made possible by the rings 50 which can yield individually in response to uneven pressure by the margin of the insole which is being coated by the roll. To key the roll 10 to the drive shaft 12, it is provided near one end with a transverse pin 52 which extends diametrically across the bore of the roll. This pin enters a slot 54 in the end of the drive shaft 12. When the machine is not in operation, there is no cement 14 in the trough 16 so that the end plate 18 can readily be removed, thus permitting the withdrawal of the roll 10 from the drive shaft 12. The end flange 44 can then be unscrewed or otherwise detached from the core 40 so that the various parts of the roll can be disassembled for cleaning. The plane faces of the several rings are accurately ground so that when the rings are assembled, no cement can get in between them. Since the rings must be slidable upon one another so as to be able to yield in-

dividually downward, the radial thickness of each is made small so that the area of interfacial contact between successive rings will be at a minimum. This minimizes frictional resistance to the individual yielding movements of the rings and also provides room for a cushion member 46 of substantial thickness.

To control the quantity of cement which is brought by the roll 10 into contact with the work piece, the roll is mounted so that its rising side which carries the cement up from the pool is touched or nearly touched by a lip 56 of the trough 16. To avoid unevenness in the cement film when some of the rings 50 are depressed by the work piece passing under the press roll 20, the roll 10 is mounted with its axis on a level with the lip 56. The lip, instead of being the usual sharp edge, is made with a vertical flat so that when one or more of the rings 50 are depressed, the clearance between them and the lip is not changed, the vertical width of the flat being as great as the maximum depression of any of the rings 50.

The knurls on the circumference of the roll may be of different degrees of coarseness or fineness according to the character and consistency of the cement, which is to be carried up by this surface. In some cases, it may be desirable to carry up extra quantities of cement. This can be done by providing circumferential grooves 60 in the surface of the roll. These grooves may be formed by cutting a circumferential recess in each of the rings 62 as shown in FIGURE 8.

Another way of making a roll with circumferential grooves is illustrated in FIGURE 9, successive rings 50 being spaced by spacer rings 64 which have an exterior diameter less than that of the rings 50. The spacer rings

may be of any convenient material, such as synthetic resin consisting of a tetrafluoroethylene polymer known as Teflon. The spacer rings 64 may also be of metal or any other synthetic resin which is not affected by contact with the cement which is to be used in the machine.

We claim:

In a machine for applying liquid cement to insoles, a trough adapted to hold a pool of liquid cement, said trough having an inwardly projecting lip at one side thereof, a cementing roll rotatably mounted in said trough to rotate about a horizontal axis parallel to said lip and on a level therewith, said roll comprising a cylindrical core, a cylindrical layer of substantial thickness of soft resilient material fitted on said core, and a series of narrow rings of rigid material arranged side by side and fitted on said soft layer, each said ring having plane parallel side faces in face-to-face contact with the next adjacent rings, the outer circumferential faces of said rings together normally presenting a cylindrical surface, said lip of the trough presenting a vertical flat face to the surface of the roll, said flat face having a vertical width as great as the maximum downward displacement of said rings resulting from pressure on top thereof.

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