June 20, 1939. W. L. MacKENZIE 2,162,781

COATING APPARATUS

Filed Feb. 27, 1936

Fig.1.

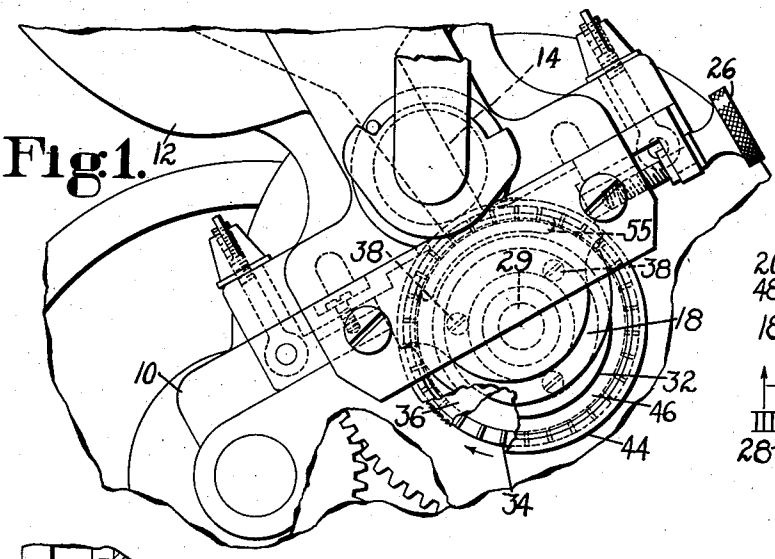


Fig.2.

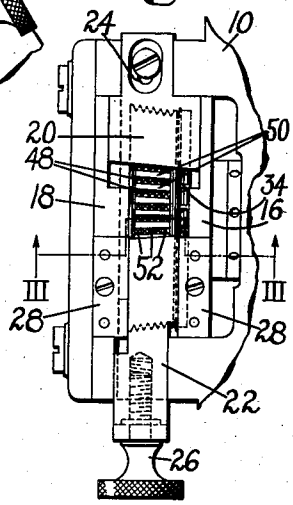


Fig.3.

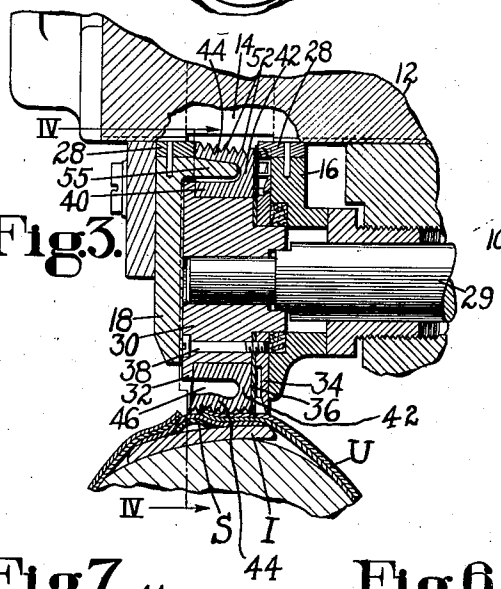


Fig.4.

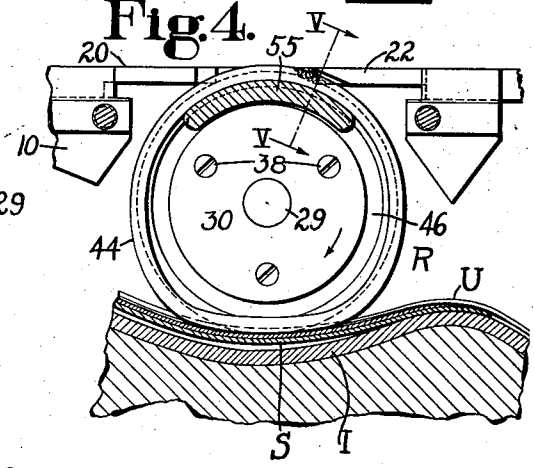


Fig.7.

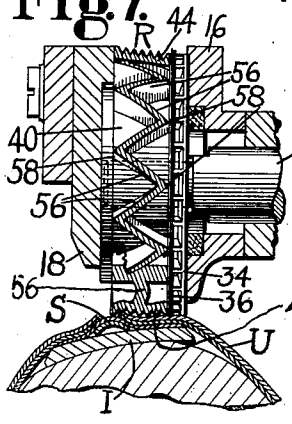


Fig.6.

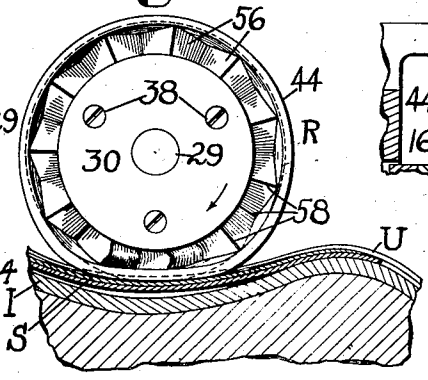
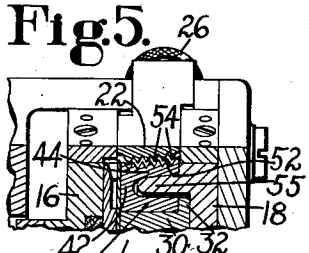


Fig.5.



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UNITED STATES PATENT OFFICE

2,162,781

COATING APPARATUS

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Application February 27, 1936, Serial No. 66,078

14 Claims. (Cl. 12—80)

My invention relates to such apparatus as that employed for coating shoe-parts, it more particularly involving machines for applying an adhesive to shoe-bottoms in preparation for the attachment of the outsoles.

For work of the character of that above indicated, a recognized practice is to use a rotatable applying roll, to the periphery of which the adhesive is delivered, and in contact with which the margin of the shoe-bottom is moved to receive its coating. It is desirable that the applying surface of the roll shall carry a considerable body of the adhesive to supply to the work a sufficient coating, and that such surface shall be capable of conforming to irregularities of the work-surface, so the coating shall be substantially continuous. It is an object of my invention to satisfy these conditions, and for this purpose, I combine with a rotatable support, as a driven shaft, a roll of yieldable material having more essentially three portions. These are an inner portion which is held by the shaft, an outer portion surrounding and being spaced from the inner and connected to it by the third portion, which may be in the form of a flange. The outer portion furnishes at its periphery an applying surface and, on account of its capacity to be flexed and to yield with the intermediate portion in the space between it and the inner portion, can readily adapt itself to the contour of the surface operated upon. I have here shown the applying surface as furnished by the grooved or toothed edges of ribs which extend transversely of the periphery of the roll and are spaced from one another. The spaces between the ribs are capable of carrying an adequate body of the adhesive, and the toothed edges are adapted to enter and coat the smaller depressions in the work. It is customary to supply the applying roll of a machine of this character through a passage leading from a receptacle for the coating-material, and to associate with the passage a member, as a scraper, by which is controlled the thickness of the coating upon the applying surface. To prevent the yieldability of the outer roll-portion from interfering with the accuracy of this control, I have provided in the space between the inner and outer roll-portions, means for supporting said outer portion. This means may consist of a normally stationary member extending into the space, or of supporting means carried by the roll itself. In the first instance, an arcuate abutment is shown opposite the adhesive-delivering passage and the scraper. In the second, I may employ transverse walls, situated in the space between the inner and outer roll-portions. The abutment being removed from the working point of the roll, in no way decreases the effectiveness of its yieldability. The walls permit the necessary yield, yet hold the applying surface in sufficiently definite relation to the scraper.

In the accompanying drawing are illustrated two of the possible embodiments of my invention.

Fig. 1 is a broken side elevation of a shoe-bottom-cementing apparatus including one form of the invention;

Fig. 2, a top plan view with the cement-pot removed;

Fig. 3, a transverse section on the line III—III of Fig. 2;

Fig. 4, a section on the line IV—IV of Fig. 3;

Fig. 5, a sectional detail on the line V—V of Fig. 4;

Fig. 6 is a side elevation of another form of my improved applying roll, and

Fig. 7 is a vertical section therethrough and including the immediately associated elements.

The present invention may effectively be made a part of the bottom-cementing machine disclosed in Letters Patent of the United States No. 1,993,718, Miner, March 5, 1935. In this apparatus, a frame 10 carries the cement-pot 12 delivering its contents through a passage 14, which supplies a roll-casing formed by inner and outer side-plates 16 and 18, respectively. The discharge of cement from the passage 14 into the casing is controlled by opposite gates 20 and 22, movable upon the tops of the side-plates. The first of these, which is at the upgoing side of an applying roll R contained in the casing, prevents the downward escape of the cement. The second, 22, is a scraper which may be moved into close proximity to the periphery of the roll at the downgoing side to regulate the amount of the adhesive which it carries to the work. Adjusting means 24 and 26 are furnished for the respective gates, the latter being at all times accessible to the operator. Scrapers 28, 28 attached to the tops of the side-plates clean the sides of the roll.

Journaled in the frame and extending at its outer end into the roll-casing, is a driven shaft 29 to which the roll of this invention is fixed. My improvements concern especially the applying portion of the roll, and these have been shown herein as associated with certain elements of the roll disclosed in the Miner patent, already referred to. The latter elements may include a

hub 30 provided with an integral flange 32 at its outer end and an inner chambered head 34 and directly co-operating disk 36, these all being secured to one another by screws 38 and rotatable with the shaft 29. They support and co-operate with the applying means proper. Referring first to Figs. 1 to 5, the applying means is shown as having a central sleeve 40 fitting tightly about the hub 30 and clamped at its sides between the hub-flange 32 and the disk 36. From the inner extremity of the sleeve, a thin, flexible and, hence, laterally tiltable flange 42 projects radially, and from its periphery a generally cylindrical peripheral wall 44, separated from the sleeve by a considerable space 46, extends outwardly to substantially the same distance horizontally to overlie and be concentric to said sleeve. The applying roll is formed, as by molding, of some yieldable material which effectively resists abrasion and which is not attacked by the solvents used in cements. Either of the rubber substitutes, Neoprene or Thiokol, is suitable for this purpose. Both the space 46 and the peripheral wall 44 lie outside the flange 32, so said wall is free to yield toward the axis of rotation under the pressure of work applied to the periphery of the roll. As appears in the drawing, this applying surface of the roll may be furnished by transverse ribs 48, separated from one another by spaces 50 (Fig. 2). The ribs are preferably toothed, as is indicated at 52. Both the spaces 50 and the circumferential grooves about the roll which form the teeth furnish cement-carrying depressions, the former being of considerable capacity.

The coating-controlling scraper 22 has at its edge co-operating with the roll a toothed formation 54 (Fig. 5) complemental to the teeth 52, so it will act more uniformly upon the applying surface. Due to the yield of the peripheral applying wall 44, especially as it has been deformed by the pressure of the work upon its lower portion, it might not be evenly spaced from the scraper across its width. Therefore, opposite this scraper and also opposite the edge of the gate 20 and the passage 14, an arcuate abutment 55 projects from the side-plate 18 into the space 46. For a circumferential extent limited to that opposite the point of application of the work to the roll, the abutment nearly fills the space, its rounded end lying close to the rounded surface of the flange 42 which forms the end of the space. As a result of this relation, as the peripheral wall 44 rises from its contact with the work, its passage over the abutment insures that it will be maintained at a substantially unvarying distance from the inner edges of both the gates 20 and 22, so the delivery of the cement from the receptacle will be constant for any adjustment of the gates.

Figs. 3 and 4 of the drawing illustrate the action of the applying roll upon the work, this work being shown as the shank-portion of the insole of a shoe carrying a reinforcement S and having the edges of an upper U lasted over it. To the margin of the upper, a band of cement is to be applied. The roll-spaces 50 will carry at the applying surface a body of the adhesive, delivered from the pot 12 through the passage 14, ample to lay a coating of the desired thickness upon the margin and to fill the major depressions therein as the work is pressed by the operator against the under side of the roll. The peripheral applying wall 44 and its supporting flange 42 yield, so the former may adapt itself to both the transverse contour of the margin (Fig. 3) and the longitudinal contour (Fig. 4), while the teeth 52 comb out and even the coating, at the same time forcing it into the minor irregularities of the work. The maximum yield of the applying roll comes at the outer free extremity, where it must be most deflected to conform to the rough surface of the shoe bottom to be coated.

Another means for maintaining the normal form of the applying surface at other points about its periphery than at its contact with the work, is illustrated in Figs. 6 and 7. Extending transversely of the space 46 between the sleeve 40 and the peripheral wall 44, are intermediate walls 56, each of which lies in a plane inclined to the axis of the roll at less than a right angle. These walls 56 are preferably molded integrally with the remainder of the yieldable roll and are shown as alternately oppositely inclined or zigzag and connected to one another at their apices 58, so they are continuous about the entire circumference of the roll. These thin, flexible walls 56 may furnish the sole support of the peripheral applying wall 44, the flange 42 being omitted. The effect of these interposed walls is to support the applying wall and insure its normal positioning when not subjected to pressure, as that of the work. Thus, the proper action of the gates 20 and 22 is provided for, yet, as appears at the lower portion of Figs. 6 and 7, the yield of the walls 56 and that of the peripheral wall 44, especially at the spaces between the points 58, permits the applying surface to conform to that operated upon. Otherwise, the roll operates as has already been described.

Having described my invention, what I claim as new and desire to secure by Letters Patents of the United States is:

1. In a coating apparatus for the over-lasted upper around the bottom of a shoe, a rotatable support, an applying roll comprising a sleeve surrounding the support, a flange projecting from one extremity of the sleeve and a coating-applying peripheral wall extending from the periphery of the flange concentric to and overlying the sleeve with its free edge unsupported, said flange and wall being both of yieldable material, and means for supplying coating material to said roll.

2. In a coating apparatus for the overlasted upper around the bottom of a shoe, a rotatable support, an applying roll of yieldable material having an inner portion contacting with the support, a thin, flexible flange projecting outwardly from the inner portion and a thin, flexible outer work-engaging portion extending from the flange and surrounding and being spaced from the inner portion, the outer portion being provided with spaced ribs between which are coating-receiving depressions, the ribs having toothed work-contacting edges, and means for supplying coating material to said roll.

3. In a coating apparatus, a rotatable support, a roll of yieldable material having an inner portion contacting with the support, a flange projecting outwardly from the inner portion and an outer work-engaging portion extending from the flange and surrounding and being spaced from the inner portion, and substantially rigid, stationary member extending into the space between the inner and outer portions.

4. In a coating apparatus, a rotatable support, a roll of yieldable material having an inner portion contacting with the support, a flange projecting outwardly from the inner portion and an outer work-engaging portion extending from the flange and surrounding and being spaced from

the inner portion, and a substantially rigid, stationary member extending into the space between the inner and outer portions and lying at the opposite side of the roll from the point of engagement of the work with the outer portion.

5. In a coating apparatus, supplying means having a passage through which coating-material is deliverd, a coating-applying roll of yieldable material receiving the coating-material from the supplying means and having an annular space opening through one side thereof and about which is a coating-applying surface, and an abutment member extending into the space.

6. In a coating apparatus, supplying means having a passage through which coating-material is delivered, a coating-applying roll of yieldable material receiving the coating-material from the supplying means and having an annular space opening through one side thereof and about which is a coating-applying surface, and an abutment member extending into the space through a limited circumferential extent at the delivery-passage.

7. In a coating apparatus, means for supplying coating-material, a coating-applying roll of yieldable material receiving the coating-material from the supplying means and having an annular space opening through one side thereof and about which is a coating-applying surface, means for controlling the amount of material delivered upon the applying surface, and an abutment member extending into the space through a limited circumferential extent at the controlling means.

8. In a cementing apparatus, a cement-receptacle having a delivery-passage, an applying roll of yieldable material receiving cement from the passage and having at one side an annular space, a scraper for the applying-surface of the roll, said scraper being situated adjacent to the passage, and an arcuate abutment extending into the annular space of the roll adjacent to the delivery-passage and the scraper.

9. In a coating apparatus, a rotatable support, a roll of yieldable material having an inner portion contacting with the support, an outer work-engaging portion surrounding and being spaced from the inner portion, and a plurality of plane radial walls carried by the roll within the space for yieldably supporting the outer portion, said radial walls being arranged in a zizzag fashion around the inner periphery of said outer portion.

10. In a coating apparatus, a rotatable support, a roll of yieldable material having an inner portion contacting with the support, an outer work-engaging portion surrounding and being spaced from the inner portion, and plane walls situated in the space and connecting the inner and outer portions, the planes of said walls being inclined to and intersecting the axis of the roll at other than a right angle.

11. In a coating apparatus, a rotatable support, a roll of yieldable material having an inner portion contacting with the support, an outer work-engaging portion surrounding and being spaced from the inner portion, and plane walls situated in the space and connecting the inner and outer portions, said walls being inclined to the axis of the roll.

12. In a coating apparatus, a rotatable support, a roll of yieldable material having an inner portion contacting with the support, an outer work-engaging portion surrounding and being spaced from the inner portion, and walls situated in the space and connecting the inner and outer portions, said walls being inclined transversely of the roll, the adjacent walls meeting one another at the opposite sides of the roll.

13. In a cementing apparatus, a cement-receptacle having a delivery-passage, an applying roll having a peripheral portion of yieldable material supported only at one end of the roll, said roll receiving cement from the passage and having transverse peripheral ribs furnishing applying-surfaces in which are circumferential grooves, a scraper having projections entering the grooves, and means for supporting the cement-receiving peripheral portion of said roll adjacent to said scraper for cooperation therewith.

14. In a coating apparatus, a rigid disk the periphery of which is adapted to contact the relatively smooth margin adjacent to the periphery of the overlasted upper on the bottom of a lasted shoe, an applying roll formed integrally of yieldable material and having spaced inner and outer portions, at one extremity of which portions is a connecting portion beside said disk, the free margin of said outer portion being adapted to coat the rougher inner margin of the overlasted upper.

WILBUR L. MACKENZIE.