Dec. 4, 1923. 1,476,047

I. C. BUCKMINSTER

COATING APPARATUS

Filed Aug. 18, 1920 2 Sheets-Sheet 1

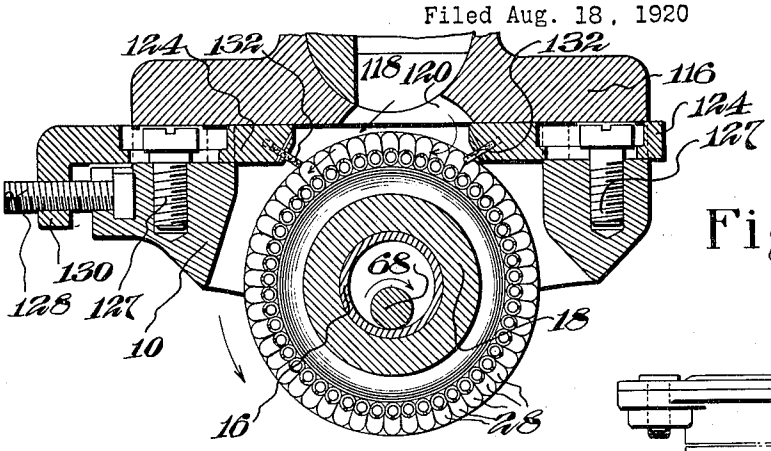


Fig. 5.

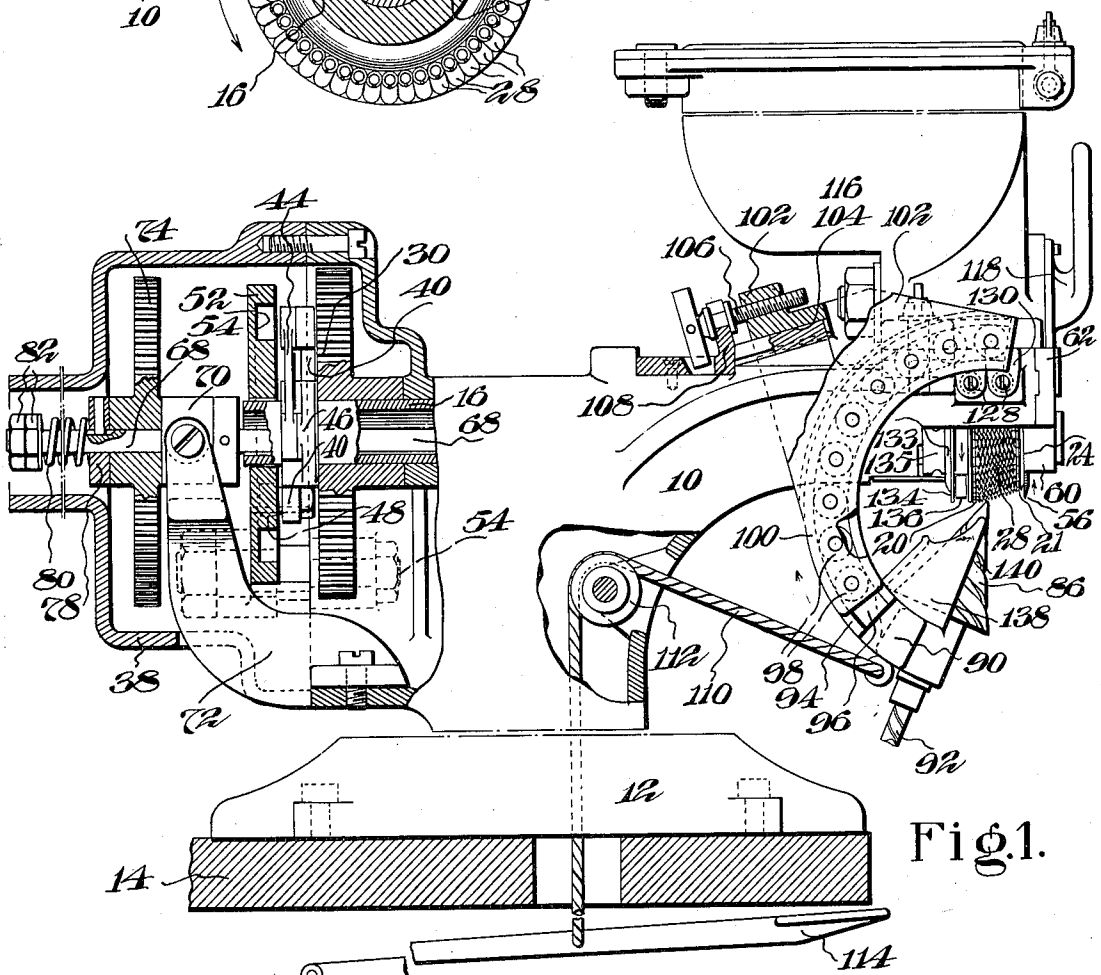


Fig. 1.

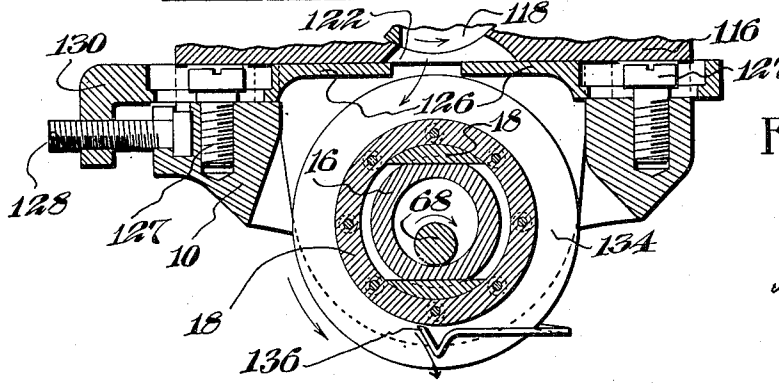


Fig. 6.

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COATING APPARATUS

Filed Aug. 18, 1920 2 Sheets-Sheet 2

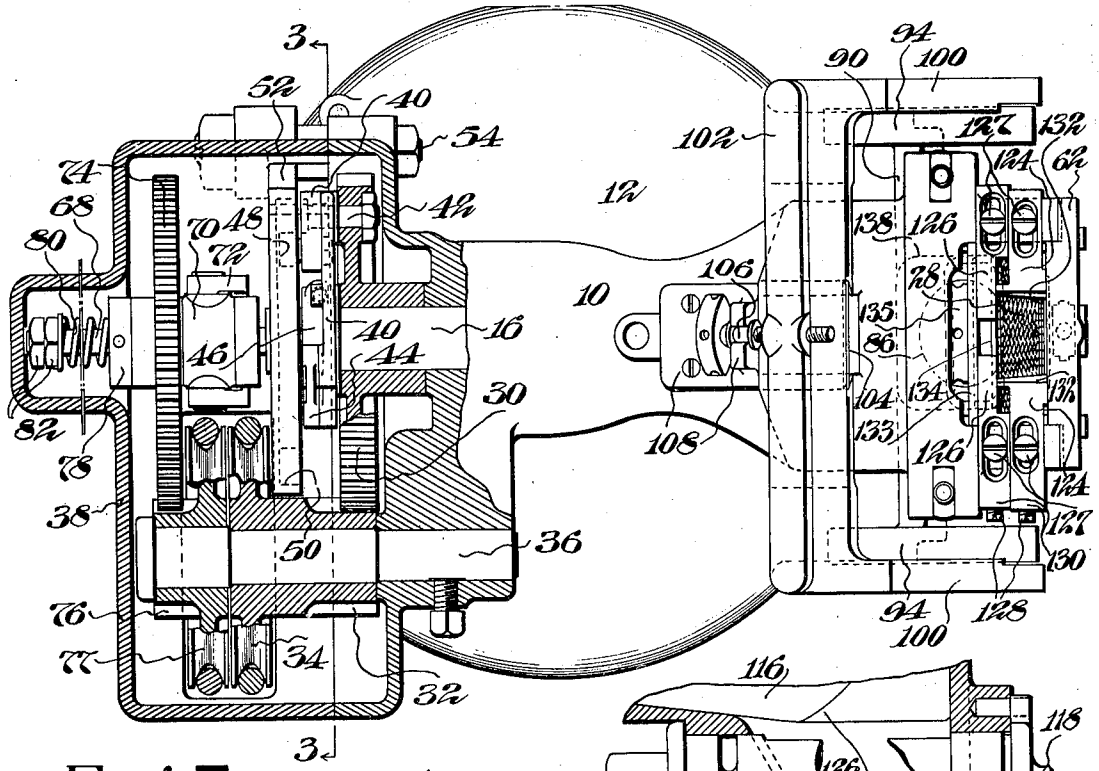


Fig. 2.

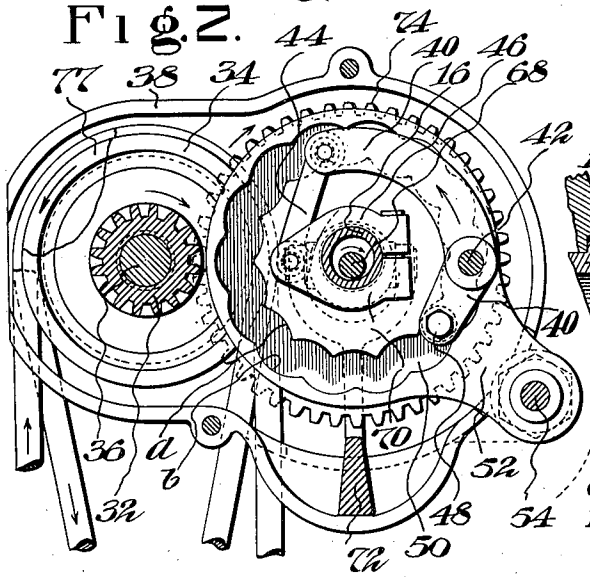


Fig. 3.

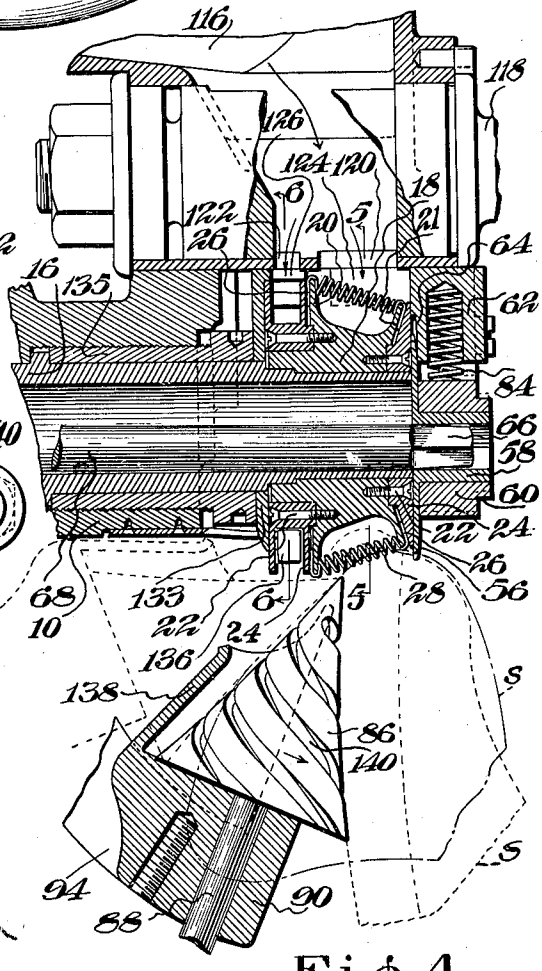


Fig. 4.

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Patented Dec. 4, 1923. 1,476,047

UNITED STATES PATENT OFFICE.

IRA C. BUCKMINSTER, OF BEVERLY, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

COATING APPARATUS.

Application filed August 18, 1920. Serial No. 404,426.

To all whom it may concern:

Be it known that I, IRA C. BUCKMINSTER, a citizen of the United States, residing at Beverly, in the county of Essex and State of Massachusetts, have invented certain Improvements in Coating Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to apparatus for the application of fluid substances to various objects, it being more particularly adapted for coating shoe parts with an adhesive. The embodiment of the invention which I have chosen to illustrate is organized for cementing both the foxing area and bottom of a shoe. In laying the soles of rubber-soled shoes, the usual practice is to cement them to the shoe bottoms, and effect a more perfact union between the edges of the soles and the uppers by cementing between them, about the entire lower edges of the uppers, strips of thin, high-grade rubber, termed "foxing." The area over which a foxing is laid varies considerably both with respect to its transverse curvature and its angle to the shoe bottom, approaching more closely a straight line and making a more obtuse angle to the bottom at the shank portion than at the heel and toe portions. Moreover, between shoes of different sizes variations in curvature and angle occur in the same portion. These peculiarities of contour and relation render the foxing area extremely difficult to cement by machine, especially in view of the fact that the upper edge of the cemented surface must be even to avoid marring the shoe upper, and since it is desirable to simultaneously coat the bottom. Objects of the present invention are to provide an apparatus by which the coating for attaching the foxing may be applied rapidly and uniformly, with a sharply defined edge, and by which the bottom may, if desired, be coated at the same time as the foxing area. In the accomplishment of the above purposes, a feature of the invention consists of a spring member having convolutions furnishing an applying surface. Preferably, a helical spring is employed, having its convolutions separated, as by placing the spring under tension. A plurality of these springs are shown herein arranged in a circumferential series upon a rotatable member, each spring extending transversely of the direction of movement. The springs readily conform, under slight pressure of the work against them, to the changing transverse contour of the foxing area, and the spaces between the separate convolutions are effective in holding the coating fluid and presenting it to the surface operated upon.

In work of the character of rubber-soled shoe uppers, irregularities exist in the surface to which the fluid is applied, this being produced, for example, by the seams which join the vamp to the quarters. In operating over these irregularities it is difficult to apply a uniform coating. In relative movement of the applying member and work in one direction, as from the higher to the lower surface lapping at the seam, said applying member tends to jump over the lap, leaving an uncoated transverse strip along the seam. Upon movement in the opposite direction, or when the applying member acts against the raised edge of the lapped portion, an excess of the fluid is deposited at the seam. A feature of the invention overcoming this difficulty involves novel means for alternately accelerating and retarding the movement of the applying member. Thus an applying member which is moved at a constant rate is also oscillated by cam mechanism, its movement being alternately accelerated and retarded. I have shown a rotatable driving member with a lever fulcrumed thereon, there being connections between the lever and applying member. Upon this connecting chain the cam, or other oscillating means, may act. The result of this is to more uniformly distribute the fluid, forcing it into the angle between the layers by the oscillation in one direction, and drawing it away in the opposite direction. The effect over the entire area operated upon is, in fact, to work out or equalize the coating.

A further feature of the invention involves relative movement between the work and applying member, which brings about

the presentation of the entire area to be coated to the latter. I prefer to employ a rotatable applying member, and adjacent to one extremity only of this a rotatable feeding member. The direction of rotation of these members is opposite, and in consequence the applying member places upon the work not only a coating which is rubbed in by the direct contact of the member with the surface to be coated, but also a portion which is laid upon the surface already treated, as just indicated, but without the rubbing action. By this means a thicker coating may be obtained. As shown herein, the feeding and applying members are arranged for relative movement laterally of their axes, the feeding member preferably having a sliding bearing which permits it to yieldably follow the work in its movement.

In cementing for the foxing or in like operations, it is convenient to have a bottom rest along which the work is moved to maintain it in a definite relation to the applying member. In this connection, as a feature of the invention. I furnish novel means arranged to change the angular relation of this rest to the area operated on. This enables the operator to shift the shoe with respect to the applying member to cause correct action over the differently inclined shank portion and heel and toe portions. As the width of the applied coating should remain constant regardless of the angular variation just mentioned, the work-rest when thus arranged is preferably movable about a normally fixed point located approximately in its work-engaging surface. But since in connection with different pieces of work it may be necessary to alter the width of the coating, I have also shown means arranged to vary the normal position of the rest along the applying member.

Still another feature of the invention concerns novel means for simultaneously coating a plurality of work surfaces, as the foxing area and bottom of a shoe. With each of such portions an applying member cooperates, these members being independently supplied with the coating fluid. I may, for coating one of the work surfaces, utilize a rotatable work-rest. On account of the preferred location of the associated applying means, this second applying means or work-rest has an upwardly extending work-engaging surface, and upon this surface the coating fluid is delivered. To counteract the effect of gravity, this applying member may include means for elevating the fluid along its surface, and preferably has combined with it means for retaining the excess of fluid which it receives. The disclosed embodiment of the invention has, for supplying the coating fluid to the applying members, an elevated reservoir with a separate and independently controlled outlet for each member, but delivering initially to one of them.

Upon consideration of the following description and claims, with the accompanying drawings, other features will become apparent. In these drawings,

Fig. 1 is a broken front elevation of one form which my invention may assume;

Fig. 2 is a top plan view thereof with a portion broken away;

Fig. 3 is a vertical section on the line 3—3 of Fig. 2;

Fig. 4 is an enlarged vertical, sectional detail through the applying members; and

Figs. 5 and 6 are vertical, sectional details on the lines 5—5 and 6—6, respectively, of Fig. 4.

The frame of the apparatus includes a standard 10, rising from a base 12, which may be adapted to be secured to a bench 14. Rotatable in horizontal bearings in the standard is a shaft 16, here shown as tubular. At one extremity of the shaft is mounted an applying device or roll comprising an annular body 18, at the ends of which are formed outwardly extending flanges or walls 20 and 21. Co-operating with the outer surface of each wall and secured to the body by screws 22 are disks 24, 24. The spaces between these disks and the body flanges receive the angular ends 26 of helical springs 28, the springs being thus clamped between the flanges and disks, the latter of which are drawn into contact with the springs by the screws 22. The springs are situated side by side in a circular series, the succeeding springs being in close proximity to one another, or in substantial contact, thus furnishing an almost continuous applying surface. Each spring extends in the general direction of the axis of the shaft 16, but is shown as slightly inclined downwardly and outwardly, so that the applying surface has the form of a truncated cone. This inclination of the surface permits the operator to more conveniently present the work thereto, a shoe in a considerable portion of its passage beneath the applying member being held with the axis through the cone of its last in a substantially horizontal position. It is to be noted that the spring-supporting flange 21 is inclined outwardly from the vertical. This avoids interference with the yield of the inclined springs as the work is pressed against them. The convolutions of the springs are somewhat separated, preferably by putting them under slight tension when mounting them upon the supporting walls. The spaces thus provided give pockets holding the cement for application to the work, the grooves between the adjacent springs also furnishing other pockets extending the full width of the applying surface.

The shaft 16 is preferably rotated to pro-

duce a constant advance of the applying surface over the work, by a driving member in the form of a gear 30 free to turn to some extent upon the shaft. The gear meshes with a pinion 32 formed upon the hub of a pulley 34 mounted upon a spindle 36 projecting from the standard within a casing 38 formed at the end thereof. The pulley 34 is belted to some suitable source of power. The connection of the gear 30 to the shaft 16 is through a lever 40 fulcrumed at 42 upon the outer face of the gear, and having its longer arm connected by a link 44 to an arm 46 clamped upon the shaft 16. This lever, link and arm communicate the rotation of the gear to the shaft. At the same time, the shaft is oscillated by a projection 48 from the short arm of the lever 40, this projection entering a groove 50 generally sinusoidal in form, or arranged in curves at alternately increasing and decreasing distances from the axis of a cam-disk 52 supported upon the shaft and held against rotation by a connection 54 to the frame. As the gear 30 is turned, the projection 48 contacts in succession with a trough *a* and then with a crest *b* of the cam-groove. As a result of this, there is imparted to the lever a movement of oscillation which is communicated through the link 44 and arm 46 to the shaft 16. The rate of movement of this oscillation is greater than that at which the shaft is rotated, so that the applying surface moves back and forth circumferentially as it is advanced by the driving member.

To assist the operator in moving the work past the applying device to receive its coating therefrom, there is provided at the outer end of the body 18 a feed-disk 56 milled or serrated at its periphery to more effectively engage the work. This disk is rotatably mounted, by a hub 58 projecting from one side, in a block 60 arranged to slide vertically in ways in a plate 62 bolted across the side of the standard. At the inner side of the plate is a recess 64, in which the feed-disk operates, the wall of this recess holding the disk in contact with the outer face of the body-disk 24. Through the hub is an axial opening squared to receive a correspondingly squared end 66 of a shaft 68 extending through the opening in the shaft 16. At the opposite extremity, this shaft 68 is rotatable in a bearing 70 trunnioned upon a bracket 72, rising from the opposite side of the standard from the applying device. Arranged to turn about the shaft 68 is a gear 74 meshing with a pinion 76 formed upon the hub of a pulley 77 driven from the source of power in a direction opposite to that of the pulley 34. At the outer side of the gear is a disk 78 splined to the shaft and pressed against the end of the gear hub by a spring 80 surrounding the shaft and bearing at its outer extremity against one of a pair of nuts 82 threaded upon the shaft 68. This arrangement furnishes a frictional driving connection between the gear and the feeding shaft, so that in event of the work not being advanced as rapidly as the disk 56 turns, the latter may slip without injury to the work. The shaft 68 is of considerably less diameter than the opening through the shaft 16, so that it may play laterally upon its trunnions. The feed-disk is held normally downward, projecting below the adjacent applying surface of the device 18, by a spring 84 situated in a recess in the plate 62 and bearing against the top of the block 60. As the work is pressed against the feed-disk to bring the former against the applying surface, said disk rises against the tension of the spring to permit the effective engagement of the work with the applying surface, yet is always held in feeding contact therewith. The disk 56 also acts as a gage which is interposed between the applying surface and the portion of the work which is to remain uncoated, it limiting the passage of cement in this direction, and producing a clean line of demarkation between the coated and uncoated areas.

The operator is aided in holding the work with the feed and gage-disk 56 at the upper edge of the foxing area by a rest contacting with the bottom of the shoe, the portion of this rest adjacent to the applying roll being spaced from the disk 56 by an amount approximately equal to the width of said area. As illustrated, this work-rest consists of a cone 86, the apex of which is in close proximity to the applying surface, while the base lies below it at an angle to the horizontal, giving a work-engaging surface, furnished by the wall of the cone, which is approximately vertical. The rest may serve also as an applying member, and to this end is rotatable, preferably in a direction opposite to that of the feed-disk. As illustrated, it is fixed upon a spindle 88 turning in a bearing member 90 and operated by a flexible shaft 92 geared to the source of power, the connections between the shaft and source not appearing in the drawings. The bearing member is carried upon the end of segments 94, 94 joined to the ends of said member at opposite sides of the standard, and having in their outer faces segmental grooves 96 which receive series of rolls 98 arranged along arcs of circles upon supports 100 depending from the ends of a yoke 102. The centers of the arcs along which the axes of the rolls are located lie approximately in a line passing through the apex of the conical rest 86, and therefore in the work-engaging surface. The yoke 102 is mounted to slide at 104 upon the frame, and has a threaded opening to receive a screw 106 arranged to turn in a lug 108 projecting upwardly from the frame. The surface upon which the yoke

is supported is inclined at substantially the same angle to the horizontal as is the under side of the applying surface, so that when it is moved by the screw, the apex of the cone is caused to travel along said surface. This varies, as desired, the distance between the work-engaging surface of the rest and the feed and gage-disk 56, and thus alters the width of the area coated by the applying member. The rest may be held in its normal position, which may be considered as that occupied while the heel and toe portions of a shoe are being coated, or with the bottom-engaging surface in an approximately vertical position, by the weight of the parts, though a spring may be used, if desired, to insure the maintenance of this relation. For coating the shank portion of the shoe, this surface and that of the applying device should lie at a more obtuse angle, as illustrated in dotted lines in Fig. 4 of the drawings. To effect this change in position, there is connected to the bearing member a cord or flexible member 110, passing over a guide-pulley 112 and being joined to a treadle 114, shown as fulcrumed upon the floor beneath the bench. When in the movement of the work beneath the applying roll one side of the shank portion is reached, the operator may depress the treadle, thus shifting the work-rest and bringing its engaging surface to the position which will present the foxing area over the shank in the proper relation to the applying surface. Since this engaging surface of the rest moves, by virtue of the relation of its arcuate guides, about a point at its apex fixed with reference to the gage-disk 56, the width of the area coated will not be altered by this adjustment. After the shank portion is passed, the treadle may be released, allowing the rest to return to normal for the coating of the succeeding heel or toe portion.

Cement or other coating fluid is preferably supplied to the springs 28, and, if desired, to the bottom rest 86, from a reservoir 116 supported upon the top of the standard above the applying device through an outlet controlled by a valve 118. Below the valve is a delivery passage 120 for the applying roll, and just at one side of this is a passage 122 of less width than the passage 120, for delivery to the bottom rest. The flow through these delivery passages is respectively controlled by pairs of slides 124, 124 and 126, 126 mounted to move in depressions in the top of the standard, and guided and limited in their travel by screws 127. The adjustment of these slides may be effected by screws 128 threaded through end portions 130, depending from the slides and having their ends contacting with the frame. At opposite sides of the opening 120 are yieldable wipers or retaining members 132, preferably consisting of some such fibrous material as felt, and being inclined downwardly and inwardly toward the center of the applying device. These wipers, by their yield, are capable of conforming sufficiently to the surface of the applying device to prevent too free movement in the direction of rotation, and to substantially wholly arrest the flow of cement in the opposite direction, or down the ascending side of the roll. Escape of the cement at the ends of the applying device is prevented by a contact-plate 133 at its inner extremity and the plate 62 which is drawn against the outer extremity. The passage 122 delivers first to an annular groove or depression 134, carried by the body 18 of the applying device and being formed conveniently by the disk 24 and a parallel wall spaced therefrom. Into this groove extends a scraper 136 fixed to the frame, this scraper doffing the cement from the groove and causing it to fall upon the upwardly inclined top of the cone 86. The excess of cement flowing down over the cone is retained in proximity thereto to be used by it as needed, by a wall 138 rising from the inner side of the bearing member 90 and extending in a direction generally parallel to the adjacent cone-wall. The ends of this wall 138 terminate at points about 180 degrees apart at the sides of the cone, they here approaching closely to its surface to prevent too free movement of cement past them. The cone is provided with elevating means to carry the cement from the space in which it is retained by the wall 138, and also to raise it from the point at which it is dropped from the depression 134, this means being here shown as consisting of a helical groove 140 encircling the work-engaging surface of the cone in a left-handed direction for its right-handed rotation to cause it to exercise its elevating function. The side wall of the cone between the apex and the circumference of the base is not, in the embodiment of the invention illustrated, strictly conical, it being curved upon a radius of considerable length to more closely conform to the curved bottom surface of the shoe which is to be coated. The length of this applying surface between the apex and base is such that it operates over more than half the width of the sole, and thus upon the passage of the entire circumference of the shoe over the foxing-cementing roll the shoe bottom will be completely coated by the overlapping of the area cemented along the opposite sides.

To outline briefly the operation of the apparatus, and assuming that a shoe, indicated in dotted lines at S in Fig. 4, is to be simultaneously cemented for laying the foxing strip and the sole, and that the slides 124 and 126 have been correctly adjusted to supply the necessary quantity of cement to the foxing cementing roll and through the roll

groove 134 to the bottom rest, the operator, starting, for example, at the toe of the shoe, holds it against the surface of the conical rest in a substantially vertical position, pressing it upward against the springs 20 and the feed and gage-disk 56. The rotation of the disk advances the shoe, the operator at the same time turning it and directing it in the path in which the feeding member tends to carry it. The feed-disk yields against the upward pressure of the work, permitting the latter to be forced against the springs, which conform to it. Consequently, the cement which is carried between the convolutions of individual springs and in the grooves between adjacent springs is deposited upon every portion of the area with which the springs contact between the disk and the cone. Since the applying roll turns in a direction opposite to that in which the work is advanced, the cement is not only directly applied by the springs to the surface operated on and rubbed into it, but the cement brought down by said springs is deposited upon the surface thus coated and carried away by it without being subjected to this rubbing action of the springs upon the work. In this way a thicker coating may be deposited upon the upper, the first application preparing the surface to better receive that which follows, preventing the drawing together of the cement which tends to occur if it is laid directly without a working-out action upon the surface to be coated. At the seams the oscillation of the applying roll, superposed upon its rotation, works the cement into and out of the spaces at the ends of the lapped material, insuring against either an excess or deficiency at these points. At the same time that the foxing area is being coated, the cement, falling through the roll-groove upon the bottom rest, retained by the wall 138 and distributed over the conical surface by the groove 146, is carried to the outer wall of the cone and deposited upon the shoe bottom. Here it is rubbed in and deposited without such rubbing effect, similarly to the foxing-cementing roll. This action continues until the shank portion, lying at a substantially different angle than the toe portion, is reached. At this time the operator depresses the treadle 114, swinging the rest upwardly about its apex, which remains in unvarying relation to the applying surface of the roll. The operator following the movement of the rest with the shoe, the work is brought to the position indicated in dash and dot lines at *s*. When the shank portion is passed, the operator releases the treadle, and the roll acts upon the heel portion in a manner similar to that in which the toe has been cemented. Upon the opposite side of the shoe the treadle is again depressed and released for the coating of the shank portion, and the advance of the work continues to its completion at the toe. During this passage of the foxing area beneath the springs, the entire bottom surface of the shoe has been cemented by the conical rest.

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

1. In a coating apparatus, an applying device comprising a spring member having convolutions furnishing an applying surface.

2. In a coating apparatus, an applying device comprising a helical spring furnishing an applying surface.

3. In a coating apparatus, an applying device comprising a helical spring furnishing an applying surface, said spring having its convolutions separated.

4. In a coating apparatus, an applying device including a series of successively adjacent springs furnishing an extended applying surface.

5. In a coating apparatus, a movable applying device including a series of springs, each spring extending transversely of the direction of movement.

6. In a coating apparatus, a rotatable applying member having separated end walls, and a series of helical springs extending between the walls circumferentially of the member.

7. In a coating apparatus, a rotatable applying member having separated end walls, and a series of helical springs extending between the walls circumferentially of the member and being under tension to separate the convolutions.

8. In a coating apparatus, a rotatable applying member having separated end walls, and a series of springs extending between the walls circumferentially of the member and being inclined with respect to the axis of rotation.

9. In a coating apparatus, a rotatable applying member having separated end walls, and a series of helical springs extending between the walls circumferentially of the member, each spring of the series being substantially in contact with adjacent springs.

10. In a coating apparatus, a rotatable applying member having separated end walls, and a series of springs extending between the walls circumferentially of the member, one of the supporting walls being inclined from the springs.

11. In a fluid-applying apparatus, a rotatable applying roll having a yieldable surface in which are transverse depressions, a reservoir for fluid to be applied delivering to the upper portion of the applying roll, and yieldable fluid-retaining members contacting with the roll at each side of the reservoir.

12. In a fluid-applying apparatus, a rotatable applying member having separated end

walls, a series of helical springs extending between the walls circumferentially of the member, a fluid reservoir delivering to the springs at the upper portion of the applying member, and retaining members of yieldable material contacting with the springs adjacent to the reservoir.

13. In a coating apparatus, a movable applying member, means for advancing said member, and a cam mechanism for alternately accelerating and retarding said member in its advance.

14. In a coating apparatus, a rotatable applying member, a rotatable member for effecting such rotation, and a cam co-operating with the rotatable member for oscillating said applying member during its rotation.

15. In a coating apparatus, a movable applying member, driving means therefor, connections between the driving means and applying member, and a cam operating upon the connections, said cam and connections being relatively movable.

16. In a coating apparatus, a rotatable applying member, a rotatable driving member therefor, a lever fulcrumed upon the driving member, connections between the lever and applying member, and means for oscillating the lever.

17. In a coating apparatus, a rotatable applying member, a rotatable driving member therefor, a lever fulcrumed upon the driving member, connections between the lever and applying member, and a cam co-operating with the lever.

18. In a coating apparatus, a shaft, an applying member fixed thereto, a gear rotatable about the shaft, a lever fulcrumed upon the gear, an arm projecting from the shaft, a link connecting the lever and arm, and a cam co-operating with the lever.

19. In a coating apparatus, a rotatable applying member, a rotatable driving member therefor, a lever fulcrumed upon the driving member, connections between the lever and applying member, and a cam surrounding the shaft and being fixed against rotation, said cam co-operating with the lever to oscillate the shaft.

20. In a coating apparatus, a rotatable applying member, a rotatable feeding member situated adjacent to one extremity only of the applying member, and means for rotating the applying and feeding members in opposite directions.

21. In a coating apparatus, a rotatable applying member, a rotatable feeding member situated adjacent to one extremity of the applying member, means for rotating the applying and feeding members in opposite directions, and means for oscillating the applying member.

22. In a coating apparatus, a rotatable applying member, and a rotatable feeding member situated adjacent to one extremity only of the applying member, the applying and feeding members being arranged for relative movement laterally of the axis.

23. In a coating apparatus, a rotatable applying member, a rotatable feeding member situated adjacent to one extremity of the applying member, and a rotatable rest for the work cooperating with the applying member and being spaced along its surface from the feeding member.

24. In a coating apparatus, a rotatable applying member, a rotatable feeding member situated adjacent to one extremity of the applying member and normally projecting beyond the periphery thereof, and a bearing for the feeding member arranged to slide laterally with respect to the applying member.

25. In a coating apparatus, a tubular shaft, an applying member fixed thereto, a bearing arranged to slide laterally of the applying member at one extremity thereof, a feed-wheel journaled in the bearing, and a shaft extending through the tubular shaft into engagement with the feed-wheel and being movable laterally of said tubular shaft.

26. In a coating apparatus, a rotatable applying member, a rotatable feeding member situated adjacent to one extremity of the applying member, the applying and feeding members being arranged for relative movement laterally of the axes, and means for yieldably maintaining the members in a normal relation with respect to the lateral movement.

27. In a coating apparatus, a rotatable applying member, a rotatable feeding member situated adjacent to one extremity of the applying member, a bearing for the feeding member arranged to slide laterally with respect to the applying member, and a spring normally maintaining the bearing in one extreme position.

28. In a coating apparatus, an applying member, and a rotatable work-rest adjacent to the applying member, said rest being movable about a normally fixed point located approximately in its axis of rotation.

29. In a coating apparatus, an applying member, a rotatable work-rest adjacent to the applying member, said rest being movable about a normally fixed point located approximately in its work-engaging surface and situated in proximity to the applying surface, and means for rotating the work-rest.

30. In a coating apparatus, an applying member, a gage near one extremity of the applying member, and a work-rest situated adjacent to the opposite extremity of the applying member, the rest being arranged for movement while maintaining a point in its work-engaging surface in fixed relation to the gage.

31. In a coating apparatus, an applying roll, a feed-disk situated at one extremity thereof, a work-rest spaced from the disk and extending into proximity with the applying surface, and means for supporting the rest, said supporting means being arranged to permit variation of the angle of the rest with respect to the applying surface while maintaining normally constant the length of effective applying surface between the gage and rest.

32. In a coating apparatus, a rotatable applying member and a rotatable conical work-rest co-operating therewith, said work-rest being arranged to move laterally about its apex.

33. In a coating apparatus, a rotatable applying member, and a conical work-rest co-operating therewith said work-rest tapering to a point which is situated in proximity to the applying member.

34. In a coating apparatus, a rotatable applying member, a conical work-rest co-operating therewith, the apex of the rest being situated in proximity to the applying member, and means arranged to move the rest about its apex.

35. In a coating apparatus, an applying roll, a feed-disk situated at one extremity thereof, a work-rest spaced from the disk and extending into proximity with the applying surface, means for supporting the rest, said supporting means being arranged to permit variation of the angle of the rest with respect to the applying surface while maintaining normally constant the length of effective applying surface between the disk and rest, and means arranged to vary the position of the rest along the applying member.

36. In a coating apparatus, an applying roll, a feed-disk situated at one extremity thereof, a work-rest spaced from the disk and extending into proximity with the applying surface, means for supporting the rest, said supporting means being arranged to permit variation of the angle of the rest with respect to the applying surface while maintaining normally constant the length of effective applying surface between the disk and rest, and means arranged to move the supporting means to vary the length of such applying surface.

37. In a coating apparatus, a rotatable applying member, a conical work-rest co-operating therewith, and means arranged to shift the rest along the applying member.

38. In a coating apparatus, a rotatable applying member, a conical work-rest co-operating therewith, the apex of the rest being situated in proximity to the applying member, means arranged to move the rest about its apex, and means arranged to shift the position of the apex along the applying member.

39. In a fluid-applying apparatus, an applying member, a rotatable work-rest having an upwardly extending work-engaging surface, and means arranged to deliver the fluid to be applied upon the work-engaging surface.

40. In a fluid-applying apparatus, an applying member having an upwardly extending applying surface, and means arranged to deliver the fluid to said applying surface, there being provision for elevating fluid along the applying surface.

41. In a fluid-applying apparatus, an applying member, a work-rest having an upwardly extending work-engaging surface, and means arranged to deliver the fluid to be applied upon the work-engaging surface, the work-rest being provided with means for elevating fluid along the work-engaging surface.

42. In a fluid-applying apparatus, an applying member, a rotatable work-rest having an upwardly extending work-engaging surface, and means arranged to deliver the fluid to be applied upon the work-engaging surface, there being means associated with the work-rest and made effective in its rotation for elevating the fluid along the work-engaging surface.

43. In a fluid-applying apparatus, an applying member, a work-rest having an upwardly extending work-engaging surface, means arranged to deliver the fluid to be applied upon the work-engaging surface, and means arranged to retain in proximity to the work-rest an excess of fluid delivered thereto.

44. In a fluid-applying apparatus, an applying member, a work-rest having an upwardly extending work-engaging surface, means arranged to deliver the fluid to be applied upon the work-engaging surface, and fluid-retaining means surrounding the rest at the side opposite that with which the work contacts.

45. In a coating apparatus, an elevated reservoir, an applying member rotatable beneath the reservoir, and a retaining member partially surrounding the applying member and forming therewith a space open at the top, into which space the fluid falls from the reservoir.

46. In a fluid-applying apparatus, a rotatable conical applying member, and a reservoir situated above the applying member and having an outlet arranged to deliver fluid upon a wall of the cone.

47. In a fluid-applying apparatus, a rotatable conical applying member having a helical groove about its inclined wall, and a reservoir situated above the applying member and having an outlet arranged to deliver fluid upon the grooved wall.

48. In a fluid-applying apparatus, a rotatable conical applying member having its

apex turned upwardly and being provided with a helical groove about its inclined wall, and a reservoir situated above the applying member and having an outlet arranged to deliver fluid upon the grooved wall.

49. In a coating apparatus, a plurality of applying members, a reservoir situated above the applying members and having plural outlets delivering initially to one applying member, and independent means for controlling the outlets.

50. In a coating apparatus, an applying member having an applying surface and an adjacent depression, a fluid reservoir having separate outlets delivering to the applying surface and depression, and an applying member receiving fluid from the depression.

51. In a foxing-cementer for shoes, a rotatable cement-applying member having an applying surface furnished by a circular series of helical springs constructed and arranged to yieldably adapt themselves to both extremes of curvature of the shank and the toe and heel portions of the foxing area.

52. In a foxing-cementer for shoes, a rotatable cement-applying member having an applying surface furnished by a circular series of helical springs constructed and arranged to yieldably adapt themselves to both extremes of curvature of the shank and the toe and heel portions of the foxing area and to hold cement between their separated convolutions for application thereto.

53. In a foxing-cementer for shoes, a roll having an applying surface arranged to conform to the varying curvature of the foxing area, a bottom rest situated adjacent to the roll, and means arranged to change the angular relation of the bottom rest to the applying surface to correspond to the portion of the foxing area operated upon.

54. In a foxing-cementer for shoes, a rotatable cement-applying member having an applying surface furnished by the periphery of a helical spring arranged to yieldably adapt itself to both extremes of curvature of the shank and the heel and toe portions of the foxing area.

In testimony whereof I have signed my name to this specification.

IRA C. BUCKMINSTER.