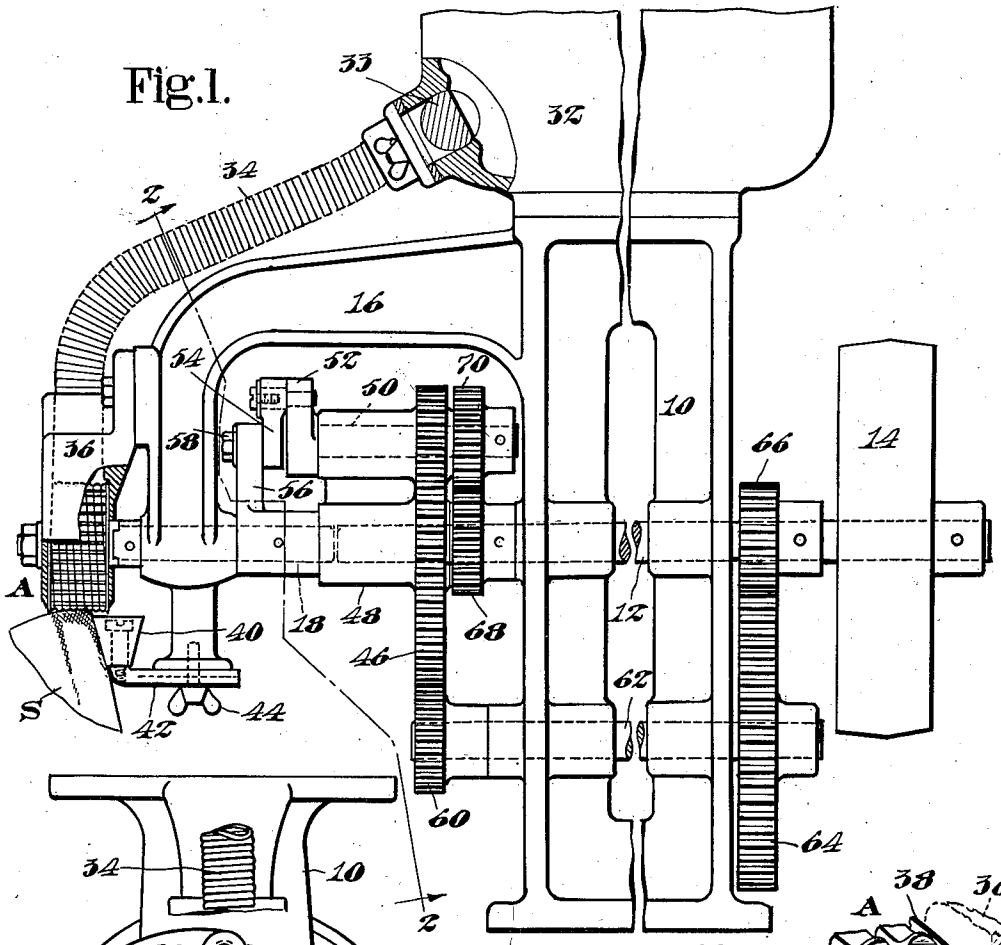
Dec. 4, 1923. 1,476,015

G. J. JULIAN

COATING APPARATUS

Filed Aug. 18, 1920

Fig.1.



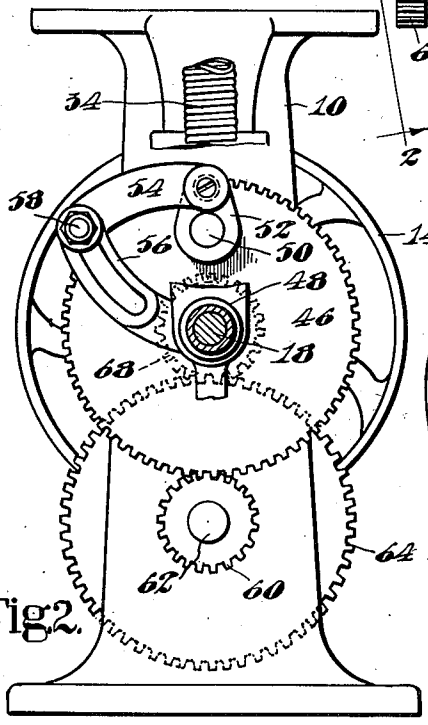


Fig.2.

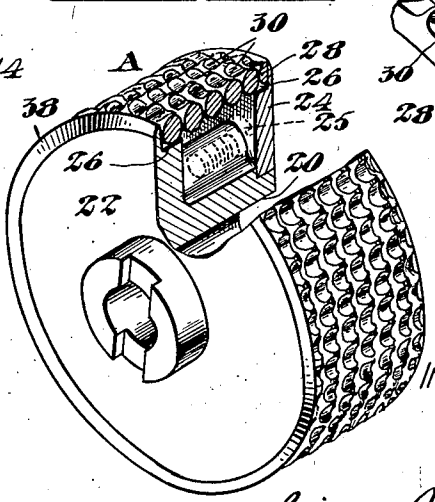


Fig.3.

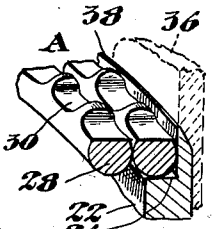


Fig.4.

INVENTOR.

Gideon J. Julian

Patented Dec. 4, 1923. 1,476,015

UNITED STATES PATENT OFFICE.

GIDEON J. JULIAN, 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. 404,373.

To all whom it may concern:

Be it known that I, GIDEON J. JULIAN, 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.

The present invention relates to apparatus for coating with fluids various objects, it being of particular utility in connection with the application of such substances as cement to surfaces differing in contour in portions successively operated upon. An example of work of this character is furnished by rubber-soled shoes, the lower edges of the uppers of which are coated with cement to secure thereto the foxing strips to which, in turn, the soles are cemented. The transverse curvature of the foxing area differs quite widely between the rather flat shank portions and the considerably curved heel and toe portions, and the surface is, moreover, made irregular longitudinally by being crossed by seams which secure together sections of the upper. It is an object of this invention to provide apparatus which will apply over such surfaces a substantially uniform coating.

In accomplishing this object, a feature of the invention consists of an applying member, furnished by a helical spring rotatable about its axis and giving upon its convolutions a surface to which the cement or other coating fluid is supplied, and by which it is laid upon the work. The applying surface of a member of this character will yield readily under the pressure of the work, so that it will conform to such extremes of curvature as the different portions of the foxing area. To present to the work a sufficient quantity of the fluid, the convolutions of the spring preferably have transverse depressions, these being shown as provided by a series of grooves arranged circumferentially of the spring. The applying spring may be supported upon rotatable disks, the illustrated embodiment of the invention having the ends of the spring seated in depressions in the disks, one of said disks preferably having an annular projection for contact with the work to gage or make uniform the edge of the coated area.

In work of the character of rubber-soled shoe uppers, the irregularities previously referred to exist, caused by the seams which join the vamp to the quarters. In operating over these irregularities, it is difficult to apply a uniform coating. In the relative movement of the applying member and work in one direction, as from the higher to the lower surface lapping at the seam, there tends to be a jumping over the lap by the applying member, which leaves 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 may be deposited at the seam. A feature of the invention overcoming this difficulty involves means for periodically changing the speed of the applying member, as by alternately accelerating and retarding its movement. Thus a member which is rotated at a constant rate is also oscillated, its movement being alternately accelerated and retarded at a rate greater than said constant rate. The result of this is to more uniformly distribute the fluid, forcing it into the angle between the layers by its oscillation in one direction, and drawing it away in the opposite direction. I prefer to effect the desired movement through driving means connected to the applying member, there being means operating upon the connection for moving the applying member. Thus, while the driving member imparts a constant rotation, the means acting upon the connection brings about the acceleration and retardation. As herein disclosed, the connection between the driving member and applying member is through a crank which, as it transmits rotation from the driving member, is itself rotated to oscillate the applying member.

In the accompanying drawing, illustrating one of several forms which my invention may assume,

Fig. 1 shows in broken side elevation an

apparatus arranged for foxing cementing;

Fig. 2 is a transverse section therethrough on the line 2—2 of Fig. 1;

Fig. 3 shows in broken perspective the applying roll; and

Fig. 4 is a similar broken detail of a portion of one edge of the roll.

Journaled horizontally in a frame 10 is a driving shaft 12, receiving power through a pulley 14. Journaled in alinement with this shaft in an arm 16 depending from the upper portion of the frame is an independently rotatable shaft 18, upon the outer extremity of which is fixed an applying roll or member A. As illustrated, this roll includes a sleeve 20, fastened to turn with the shaft 18 and having at its outer end a disk or integral flange 22 projecting at right angles to the sleeve. At the opposite or inner end of the sleeve, spaced from the disk 22, is a disk 24, which may be secured to the sleeve by screws 25. About the inner portion of the periphery of each disk is an annular depression 26, and in these depressions are seated the ends of a helical spring 28 arranged concentrically to the axis of the shaft 18. As here shown, the spring is closely wound, its convolutions being in substantial contact. This, while providing a yieldable surface, gives the effect of a rigid roll, in that there is no leakage into its interior. The outside of this helix furnishes an applying surface, the fluid which it is to deposit upon the work being in part carried by the helical V-groove existing between the convolutions and also by transverse depressions 30. These depressions may be furnished by grooves produced by milling across the spring at equidistant intervals, so that the depressions are arranged in a regular circumferential series about the periphery of the spring. The cement or other coating fluid is contained in a reservoir 32, supported upon the top of the frame and delivering through a valve 33 to a conduit 34, terminating in a casing 36 surrounding the upper portion of the applying roll. The lower edges of the ends and sides of this casing come into close proximity both to the outer faces of the disks 22 and 24 and the periphery of the spring, so that only such cement will pass from the casing as is carried down in the rotation of the roll by the helical groove and by the depressions 30. To limit the flow of the cement over the work and to define as sharply as possible the edge of the coated area, to prevent marring the adjacent uncoated surface, the outer disk 22 is provided with a peripheral flange 38 having a reduced edge for contact with the work, the diameter of this projection being greater than that of the applying surface of the spring 26, so that it extends beyond it about the entire circumference of the roll.

To assist the operator in locating the work correctly with respect to the applying roll, to cause the desired width to be coated, a bottom-rest may be employed, this appearing as an inverted frusto-conical roll 40, the axis of which rises vertically from an arm 42 fixed to the lower extremity of the frame arm 16. The arm 42 may be secured upon the frame for adjustment longitudinally of the roll by means of a screw 44 passing through a slot extending along the arm, said screw being threaded into the frame. By means of this connection of the bottom-rest to the frame, the distance between the former and the gage projection 38 of the applying roll may be varied, to correspondingly alter the width of the applied coating.

Rotatable upon the shafts 12 and 18 is a driving member consisting of a gear 46 having about its axis and at one side thereof a lateral extension or boss 48. Journaled in this boss, near the edge of the gear and parallel to the axis of the shafts 12 and 18, is a short shaft 50, upon the outer extremity of which is secured a crank 52. This crank is connected by a link 54 to an arm 56 fast upon the shaft 18. The link and the arm 56 may be joined by a slot-and-screw connection 58, allowing the point of engagement between the two elements to be shifted to alter the throw of the shaft 18 produced upon each rotation of the crank. With the gear 46 meshes a pinion 60 fixed upon a shaft 62 rotatable in the lower portion of the frame 10 parallel to the shaft 12. The shaft 62 also has upon it a gear 64, engaging a pinion 66 fast upon the shaft 12. There is also fixed to turn with this shaft 12 a pinion 68 meshing with a similar pinion 70 secured upon the crank-shaft 50. Upon rotation of the driving shaft 12, its movement will be communicated from the pinion 66 through the gear 64 and pinion 60 to the gear 46, and therefore to the driving member 48. This turning about the shafts 12 and 18 will transmit its movement through the crank 52, the link 54 and the arm 56 to the shaft 18, imparting a constant rotation to the applying roll. At the same time the pinion 68 upon the driving shaft 12, acting upon the pinion 70, will rotate the shaft 50, as it is revolved by the driving member 48, at a much higher speed than is imparted to said driving member 48. The crank 52 is thus turned, and through the link 54 and arm 56 alternately accelerates and retards the rotation of the applying roll, so that upon said rotation there is superposed a movement of oscillation. The effect of this is to cause the roll A not only to bring down cement from the casing 36 for application to work traveling beneath it, but also to rub the cement upon the work in opposite directions. Upon the movement of the applying surface toward the raised edge of a seam, the cement is carried into the angle between the pieces,

while upon oscillation in the opposite direction, there will be a tendency to draw out any excess which has been deposited. Not only here, but over the entire surface operated upon, there will be a rubbing-in effect produced upon the work corresponding generally to the desirable brushing-out action obtained in hand coating, resulting in a more uniform distribution of the applied substance, and causing it to adhere more closely to the work.

While it is thought that the operation of the apparatus will be obvious from the preceding description, it may be briefly summed up by saying that the operator in cementing a shoe, a portion of which is indicated at S, preparatory to the application of the foxing strip, after supplying the reservoir 32 with cement and adjusting the bottom-rest 40 to give the proper width of the coated area, holds the work against the inclined surface of the roll 40 and presses it against the surface of the spring 26. He then turns the shoe, maintaining the upward pressure, to bring the entire length of the foxing area into contact with the applying surface. This surface, carrying the cement in its depressions, adapts itself to all the varying transverse curvatures of the work passing beneath it, yielding to a greater extent in operating upon the curved heel and toe portions, and a less extent in its action upon the flatter shank portions. More exact conformity between the roll and the work surface may also be facilitated by rocking the work somewhat laterally upon the rest. Throughout the entire action upon the work, and especially at the seams or other irregularities, the oscillation of the applying roll is effective in accomplishing a better distribution of the cement.

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

1. In a fluid-applying apparatus, an applying member consisting of a helical spring rotatable about its axis and furnishing by its convolutions an applying surface, and means for supplying fluid to the applying surface.

2. In a fluid-applying apparatus, an applying member consisting of a helical spring rotatable about its axis and having adjacent convolutions in substantial contact, the peripheries of said convolutions furnishing an applying surface, and means for supplying fluid to the applying surface.

3. In a fluid-applying apparatus, an applying member consisting of a spring having its convolutions provided with transverse fluid-carrying depressions, and means for supplying fluid to the applying member.

4. In a fluid-applying apparatus, an applying member consisting of a helical spring rotatable about its axis and having a circumferential series of transverse grooves in its periphery, and means for supplying fluid to the applying surface.

5. In a fluid-applying apparatus, spaced rotatable disks provided with depressions, a spring seated at its ends in the depressions and furnishing an intermediate applying surface, and means for supplying fluid to the applying surface.

6. In a fluid-applying apparatus, spaced rotatable supporting disks, one of which is provided with an annular projection for contact with the work, a spring mounted between the supports and furnishing a fluid-applying surface, and means for supplying fluid to the applying surface.

7. In a fluid-applying apparatus, spaced rotatable disks provided with depressions, there being an annular projection at the outer side of one of the disks, a spring seated at its ends in the depressions and furnishing an intermediate applying surface of less diameter than the projection, and means for supplying fluid to the applying surface.

8. 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 rotate about its axis and to yieldably adapt itself to both extremes of curvature of the shank and the heel and toe portions of the foxing area.

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

10. In a coating apparatus, a rotatable applying member, and means for oscillating said applying member during its rotation.

11. In a coating apparatus, a movable applying member, means for rotating said member at a constant rate, and means for alternately accelerating and retarding the rotation of the member at a rate greater than said constant rate.

12. In a coating apparatus, a movable applying member, driving means therefor, connections between the driving means and applying member, and power-actuated means operating upon the connections for moving the applying member.

13. In a coating appartus, a movable applying member, driving means therefor, a rotatable member mounted upon the driving means, means for rotating said member, and connections between the rotatable member and applying member.

14. In a coating apparatus, a movable applying member, a rotatable driving member therefor, a crank rotatable upon the driving member, connections between the crank and applying member, and means for rotating the crank.

15. In a coating apparatus, a rotatable ap-

plying member, a shaft, a member mounted to turn upon the shaft, a shaft journaled in said member, a crank fixed to the last-named shaft, connections between the crank and applying member, and means for rotating the shafts.

16. In a coating apparatus, alined shafts, an applying roll fixed to one shaft, means for applying power to another shaft, a member rotatable about the last-named shaft, means for rotating said member, a crank-shaft journaled in the member, a crank fixed to the crank-shaft, gearing connecting the crank-shaft and power-shaft, and connections between the crank and the shaft of the applying roll.

17. In a coating apparatus, alined shafts, an applying roll fixed to one shaft, means for applying power to another shaft, a member rotatable about the last-named shaft, a counter-shaft, gearing connecting the counter-shaft with the power-shaft and with the rotatable member, a crank-shaft journaled in the member, a crank fixed to the crank-shaft, gearing connecting the crank-shaft and power-shaft, and connections between the crank and the shaft of the applying roll.

18. In a coating apparatus, a rotatable applying member, a shaft, a member mounted to turn upon the shaft, a shaft journaled in said member, a crank fixed to the last-named shaft, connections between the crank and applying member, means arranged to vary the relation between the elements of the connections, and means for rotating the shafts.

19. In a foxing-cementer for shoes having seams extending across the foxing area, an applying member rotatable over said foxing area, and means acting during the rotation of the member for turning it in opposite directions over the seams.

20. In a coating apparatus, a movable applying member, means for moving the applying member, and means for periodically changing the speed of said member.

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

GIDEON J. JULIAN.