Sept. 11, 1923. 1,467,343

C. B. TIBBETTS

COATING APPARATUS

Filed Jan. 2, 1920

Fig. 2.

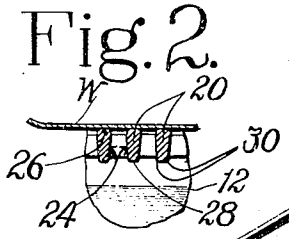


Fig. 3.

Fig 1.

INVENTOR.

Charles B. Tibbetts

By his Attorney

Nelson Mitchell

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UNITED STATES PATENT OFFICE.

CHARLES B. TIBBETTS, OF WALPOLE, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY CORPORATION, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

COATING APPARATUS.

Application filed January 2, 1920. Serial No. 348,814.

To all whom it may concern:

Be it known that I, CHARLES B. TIBBETTS, a citizen of the United States, residing at Walpole, in the county of Norfolk 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.

My invention relates to coating apparatus, and especially to that type adapted for applying paste, cement, or other adhesives to the linings and other portions of shoes.

In apparatus of the character indicated above, difficulty is encountered in so applying the adhesive to the work, especially when fabrics are to be coated along separated arears, that it will not "pipe" or draw into ridges which interfere with its smooth contact with the surface to which it is to adhere. It is one of the objects of this invention to so arrange the applying instrumentality that this distortion will be avoided. In the accomplishment of this purpose, I provide an adhesive-applying member having a series of applying portions curved in a novel manner. The arrangement results in so dividing or distributing the stresses set up in the work by the drying of the adhesive that there is not a sufficient pull upon it in any one direction to cause it to be materially drawn out of shape. I have found it desirable to arrange the applying portions concentrically throughout their entire length, and I prefer to have them present a gradually varying applying area over different portions of the coating member.

It may be desirable for an operator to change the amount of adhesive distributed over the work, because, for example, of a difference in the thickness of the material being operated upon. A further object of the invention is to furnish means whereby this change may be effected readily. To this end, I utilize a member having applying surfaces of different character, with means arranged to permit the member to be changed in its position to present the different surfaces to the work. The variations in the surfaces cause diverse coating effects. There is herein illustrated a reversible grid, which alters the application of the adhesive by a difference in the width of the bars at opposite sides.

In foot-actuated apparatus, it is often advantageous for the operator to limit the travel of the controlled member, as for instance in coating apparatus of the type herein described. Here, the operator may wish to change the extent of relative movement of the applying member and an adhesive receptacle to maintain constant, as the adhesive is used, the depth of immersion of the applying member therein. At the same time, the time and effort required by the operator to cause the immersion are minimized if there is produced the least movement which will bring about the result sought. Another object of the invention is to provide for the attainment of these conditions with little attention on the part of the operator, and in carrying this out I employ means to variably determine the extent of the movement. In the control of foot-actuated apparatus, I utilize a contact member to limit the travel of the actuating treadle, together with means arranged for actuation by the operator during the movement of the treadle to permit a variation in the position of the contact member, and consequently in the extent of movement of the treadle. The position-varying means is preferably so located as to be operable by the foot, consisting in the present instance of a stop-member variable in position upon the treadle.

Other objects will hereinafter appear in the following description, which is illustrated by the accompanying drawing, in which—

Fig. 1 is a perspective view of one of the forms which my improved applying apparatus may assume, parts being broken away;

Fig. 2 is a transverse sectional detail on the line 2—2 of Fig. 1; and

Fig. 3 is a detail in broken perspective of a portion of one of the applying bars.

At 10 is illustrated a section of a table, upon which is supported a relatively shallow pan or receptacle 12, here shown as rectangular in form, and adapted to contain the paste or other adhesive to be applied to the work. At the outside of opposite extremities of the pan are lugs 14, 14, containing vertical bores alined with similarly spaced openings in the table. Loosely through the lugs and table openings pass actuating and

supporting rods or like members 16 for an applying member 18 operating within the pan. This member 18 is preferably in the form of a comparatively thin grid of cast metal, which should be non-corrosible with respect to the adhesive in which it is to be immersed, and having separated applying surfaces furnished by spaced bars 20. These bars are shown as curved, being represented as portions of circles about a center at or near the middle of one of the longer sides of the surrounding frame 22 of the grid. The bars, therefore, are arcuate, and gradually increase in diameter from the side adjacent to their center point to the opposite side of the grid. The change of contour of the bars from the sharply curved arcs of small diameter to those approaching straight lines gives a gradual increase in the area of the outer or applying surfaces per unit area of the grid from one side to the other. The grid may also be caused to present coating surfaces the total applying area of which is different, by tapering the bars at their sides 24, 24 from a maximum width at one face 26 to a minimum width at the opposite face 28. Between the sides 24 and faces 26 and 28, the corners 30 are preferably rounded. The applying surfaces 26 and 28 are given a smooth finish, as by grinding, while the sides 24 and corners 30 are left rough, as cast. This produces at each side of the applying surfaces irregular edges 32, their outline depending on the character of the surface produced in the casting by the mold. The applying bars are preferably connected at suitable intervals by reinforcing bars 33, these being here illustrated as radiating from the center of the arcs, and being spaced from the applying surfaces, so that they do not act as coating members.

The grid is mounted upon the rods 16 by carriers 34, which are recessed to receive the shouldered extremities of the rods, the reduced ends of which beyond the shoulders are threaded and engaged above the carriers by thumb-nuts 36 to secure the carriers in place. The inner portion of each carrier is formed in a yoke with vertical, spaced arms 38, 38 having reduced ends entering openings in the frame of the grid. The grid is drawn against the shoulders of the yoke arms by hanger-rods 40, each provided with a hooked end 42, which enters a slot 44 in the adjacent end of the grid frame, and then may be turned beneath said frame. Here it seats itself in a recess 46, so it will be flush with the surface and thus permit the travel of the grid to the bottom of the pan. The upper ends of the rods, which pass through and above the carrier member, are threaded to receive nuts 48, acting to draw the hooked ends into the grid slots, or to free them therefrom for the release of the grid from the carriers. By this arrangement of support, the grid is reversible about both horizontal and vertical axes. That is, it may be turned in the pan so that either the bar faces 26 or the faces 28 will be uppermost to receive the work; or it may be rotated to bring the center point of the arcuate bars at either the front or the rear of the pan. In the first instance, the total area of the work coated is varied; and in the second, the distribution is changed, the operator always applying work pieces in the same relation as they are taken from the pile, and, therefore, coating either the side nearest to him or that farthest away most thickly, according to the position in which the grid is mounted upon the carriers. The change in grid positions is effected by loosening the nuts 48 until the rods 40 may turn with their hooked ends in alinement with the slots and allowing the grid to sink to the bottom of the pan. The carriers may then be swung free of the pan, the grid raised and turned, and the carriers and rods restored to their normal supporting positions.

The supporting rods 16 pass downwardly through guide-cages 50 secured to the under side of the table 10, these cages having in the upper and lower extremities holes opposite the holes in the table and the bores in the lugs 14. In the upper ends of the cages, the guide-openings are formed in central, upwardly projecting bosses 51, which pass through the table openings and enter depressions in the under sides of the pan lugs 14. This engagement insures the correct relation of the rods 16 and the supported grid to the pan, without the necessity of furnishing bearings for the rods in the lug openings. The cages are correctly spaced, so that the co-operation of the bosses 51 and lug depressions may be obtained without difficulty, by a connecting bar or brace 52, extending beneath the table and preferably cast integral with the cages. The grid is normally raised to its applying position at the top of the pan by springs 54 contained within the cages and surrounding the rods 16, they resting at their lower ends upon the bottom bars of the cages, and at their upper ends abutting against pins 56, which pass through holes in the rods. To allow the vertical position of the rods 16 to be varied, so they may properly raise the grid above the paste in the receptacle for different thicknesses of table to which the pan may be applied, each rod is continued by a separate section 58, the rod portions 16 and 58 having their adjacent alined ends threaded at 60. These threaded portions are engaged by a coupling sleeve 62, having at its lower end, outside its cage, a flange 64, which contacts with the bottom of the cage to limit the upward movement of the rod. The outside of the sleeve fits the opening in the lower casing head to

slide therein. When the position of a rod 16 is to be varied, the operator may hold the corresponding rod 58 by a wrench applied to a hexagonal or square portion 66, to prevent its turning, and then rotates the sleeve 62 by its flange 64. This, by the threaded connection between the sleeve and rod sections, raises or lowers the sleeve 62, similarly altering the point at which travel of the rod under the tension of the spring 54 is stopped by the sleeve flange. Each rod section 58 is joined by an independent rod section 68 to a treadle 70, pivoted at 72 upon the floor beneath the table. An alteration of the length of the treadle connections, and therefore the normal angle which the treadle makes with the floor, is permitted by clamping the sections 58 and 68 adjustably by means of bands 74 surrounding the overlapping section ends, and having set-screws threaded through them and securing the sections in place.

The quantity of paste brought up from the pan in preparation for the application of the work will vary with the depth of immersion of the grid, this being controlled by the extent to which the treadle is depressed. Usually the operator wishes to carry the upper applying face just below the surface of the paste. To so operate the treadle that the proper travel of the grid is provided for requires close attention and considerable expertness on the part of the operator. If the downward travel of the grid is such that the applying face is not fully immersed, the coating given to the work will be too thin. If, on the other hand, the travel of the grid into the adhesive is much below the surface, a too thick coating may result. Moreover, in this latter case the operator must employ a greater muscular effort and a longer time is consumed than is necessary. This burden of continuous effort to actuate the grid to the best advantage I remove from the operator by providing a readily controlled means for determining the downward extent of the treadle movement. At 78 the treadle is shown as slotted, there being upon opposite sides of the slot vertical walls 80, 80, which may be cast integrally with the treadle. In these walls there is journaled at 82 a rotatable stop-member, preferably in the form of a cam 84. This is adapted to be turned by the foot of the operator in contact with its periphery, preferably roughened as indicated at 86. The stop-cam is held frictionally in any position to which it may be turned in either direction, by a click 88 mounted upon one of the walls 80 and engaging a star-wheel 90 secured to one side of the cam to turn therewith. The cam also has a lateral pin 92, which, by contact with the under or upper surface of the treadle, will determine the extreme angular positions of the cam with relation to a contact member 94 fixed to the floor beneath it. When the pin bears against the lower surface of the treadle, the cam portion 96 of maximum radius will be alined with the contact member 94, and will stop the downward travel of the grid in the pan upon depression of the treadle at the highest plane, to secure the correct immersion of its upper applying surface in the paste when the pan contains the maximum quantity. With the pin 92 against the upper surface of the treadle, the cam portion 98 of minimum radius will cooperate with the contact member, this providing for the maximum downward travel of the grid when the paste is at its lowest level, or just before the supply is to be renewed.

In considering the general operation of the apparatus, it will be assumed that there are to be coated portions of shoe linings of some such fabric as cotton. The grid is positioned on its carrier members with the side upward which will apply the correct total area of paste to the work; and if this is of any consequence, the grid is also positioned with that side toward the operator which will distribute the paste most thickly near one or another edge of the work. With the pan supplied with paste up to a level below the upper face of the grid in its normal position, the stop-cam 84 is adjusted to give such movement of the grid into the paste for a full depression of the treadle, this being until the lowermost point in the cam periphery strikes the contact member 94, that the coating surface will raise from the body of paste a film of the desired thickness. For each work piece to be coated the operator depresses and releases the treadle, and, when the grid rises from the paste, presses upon it the work W. This is coated along separated curved areas, determined by the spacing and form of the bars, and since there is a continuous change in the direction of extension of these areas, none of the strands of the fabric, either the warp or the weft, will receive an uninterrupted coating for any great length. Therefore, when the paste dries, the strain set up in the fabric by the natural shrinkage will be so broken and distributed that it will not be drawn out of shape, but will remain flat upon the other shoe parts to which it is to adhere. This effect is increased by the irregularity of the edges of the coated areas produced by the corresponding outline of the junctures of the finished and unfinished portions of the bars. The unevenness communicated to the paste gathered upon the rounded portions of the bars effectually destroys any continuity of action of the drying paste upon the fabric strands. As the operation proceeds, and the work pieces successively remove the paste from the grid and therefore from the supply in the pan, the operator may at intervals,

with the foot, rotate the stop-cam 84 in the direction of the arrow in Fig. 1 of the drawing, so that the downward limit of movement of the treadle and grid is increased sufficiently to maintain the correct immersion of said grid in the paste. This continues until the pin 92 contacts with the upper surface of the treadle, at which time the pan may be refilled, and the cam 84 turned in the opposite direction until its pin strikes the under side of the treadle, thereafter the operations continuing as before.

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, a coating member having a series of applying portions curved throughout their length in one direction only.

2. In a coating apparatus, a coating member having a series of applying portions concentric to one another throughout their entire length.

3. In a coating apparatus, a coating member having a series of applying surfaces giving a gradual variation of applying area over the coating member.

4. In a coating apparatus, a coating member arranged for the presentation to it by the operator of the work to be coated, and having a series of concentric applying surfaces giving a gradual variation of applying area over the coating member from the side toward the operator to the opposite side.

5. In a coating apparatus, a grid having arcuate applying bars, the extremities of the arcs terminating at the outside of the grid.

6. In a coating apparatus, a coating member having a series of arcuate applying bars formed about a center situated near one side of the grid.

7. In a coating apparatus, a grid of cast metal having a finished applying surface and adjacent rounded edges of unfinished metal.

8. In a coating apparatus, a grid of cast metal having a series of bars provided with relatively smooth finished applying surfaces lying in a common plane and opposite rounded edges of unfinished metal.

9. In a coating apparatus, a coating member arranged for the presentation to it by the operator of the work to be coated, and having applying surfaces of different character, and means arranged to permit the member to be changed in position to present the different surfaces adjacent to the operator.

10. In a coating apparatus, a member having applying surfaces of different area, and means arranged to permit the member to be changed in position to present the different surfaces to the work.

11. In a coating apparatus, a reversible grid having bars presenting applying surfaces of different character at its opposite sides.

12. In a coating apparatus, a reversible grid having bars of different width at their opposite applying faces.

13. In a coating apparatus, a reversible grid having bars tapered in cross-section between the opposite applying faces.

14. In a coating apparatus, a member having an applying surface differing in arrangement at different portions, and means arranged to permit the member to be changed in position to present the surface differently to the work.

15. In a coating apparatus, a receptacle for a coating substance, and an applying member movable in the receptacle and being reversible in position about a plurality of axes.

16. In a coating apparatus, a receptacle for a coating substance, a supporting member adjacent the receptacle, a carrier member fixed to the supporting member and extending over the receptacle, an applying member situated within the receptacle, and means for drawing the applying member into engagement with the carrier member.

17. In a coating apparatus, a receptacle for a coating substance, supporting members adjacent the receptacle, a carrier member fixed to each supporting member and extending over the receptacle, an applying member situated within the receptacle and contacting at its upper side with the carrier members, and a hanger mounted upon each carrier member and engaging the under side of the applying member.

18. In a coating apparatus, a receptacle for a coating substance, supporting members adjacent the receptacle, a carrier member fixed to each supporting member and extending over the receptacle, an applying member situated within the receptacle and provided with slots, and hangers depending from the carrier members through the slots and being arranged to engage and hold the grid and to pass through the slots.

19. In a coating apparatus, a receptacle for a coating substance, actuating rods at opposite sides thereof, a yoke mounted upon each rod over the receptacle, a grid situated in the receptacle, and means mounted upon the yokes and arranged to engage the grid to hold it against said yokes.

20. In a coating apparatus, a receptacle for a coating substance, actuating rods at opposite sides thereof, a yoke mounted upon each rod over the receptacle, a grid situated in the receptacle and having openings and a slot, said openings receiving portions of the yokes, and hooks mounted upon the yokes and co-operating with the grid slots.

21. In a coating apparatus, a table, a receptacle supported upon the table and pro-

vided with depressions, guide members secured to the under side of the table and having portions entering the receptacle depressions, rods extending through the guide members, an applying member mounted upon the rods for movement in the receptacle, and actuating means for the rods.

22. In a coating apparatus, a table, a receptacle supported upon the table, an applying member movable in the receptacle, rods extending through the table and carrying the applying member, guide members for the rods secured to the under side of the table at opposite sides of the receptacle and having connection to each other beneath the table, and actuating means for the rods.

23. In a coating apparatus, a table, a receptacle supported upon the table and provided with depressioins, an applying member movable in the receptacle, rods extending through the table and carrying the applying member, guide members for the rods secured to the under side of the table at opposite sides of the receptacle and having connection to each other beneath the table, said guide members having portions entering the receptacle depressions, and actuating means for the rods.

24. In a coating apparatus, a table, a receptacle supported upon the table, an applying member movable in the receptacle, rods extending through the table and carrying the applying member, guide cages for the rods secured to the under side of the table at opposite sides of the receptacle, springs acting upon the rods within the cages, and actuating means for the rods.

25. In an apparatus of the class described, a member to be controlled, a treadle for controlling the member, a contact member to determine the travel of the treadle, and means arranged for actuation by the operator during the movement of the treadle to permit a variation in position of the contact member and in the extent of movement of the treadle.

26. In an apparatus of the class described, a member to be controlled, a controlling member therefor, and means arranged for actuation by the foot of the operator to determine the travel of the controlling member.

27. In an apparatus of the class described, a member to be controlled, a treadle for controlling the member, and a movable contact member to determine the travel of the treadle and arranged for actuation by the foot of the operator to permit a variation in position of the contact member and in the extent of movement of the treadle.

28. In an apparatus of the class described, a member to be controlled, a treadle for controlling the member, and a cam variable in position to determine the travel of the treadle.

29. In a coating apparatus, a movable applying member, a treadle for actuating the member, and a stop member mounted upon the treadle and arranged to permit variation in the projection of its contact surface from the treadle.

30. In a coating apparatus, a movable applying member, a treadle for actuating the member, and a cam rotatable upon the treadle and arranged to contact with a relatively fixed point.

31. In a coating apparatus, a movable applying member, a treadle for actuating the member, a cam rotatable upon the treadle and arranged to contact with a relatively fixed point, and means for retaining the cam in the position to which it is turned.

32. In a coating apparatus, a receptacle for a coating substance, an applying member, means arranged to cause relative movement of the applying member and receptacle to supply the coating substance to said applying member, and means arranged to variably determine the extent of such relative movement.

33. In a coating apparatus, a receptacle for a coating substance, an applying member movable into and out of the contents of the receptacle, and means arranged to vary the limit of movement into said contents.

34. In a coating apparatus, a receptacle for a coating substance, an applying member arranged for immersion in the coating substance, means arranged to move the applying member and receptacle relatively to prepare for the coating operation, and means for actuation by the operator to maintain the extent of immersion substantially constant.

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

CHARLES B. TIBBETTS.