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HEEL BLACING MACHINE.
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UNITED STATES PATENT OFFICE.

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HEEL-BLACKING MACHINE.

Patented Dec. 15, 1914.


To all whom it may concern:

Be it known that I, FREDERICK M. FUR BER, a citizen of the United States, residing at Revere, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Heel-Blackling Machines, 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 machines for applying blacking or other coloring matter to boots and shoes. The invention is herein shown and described as embodied in a machine for applying blacking to edges of heels, but many of its features may be used for applying this or similar coloring matter to other parts of boots and shoes, as for example to the edges of soles.

Certain features of the invention will also be found of value in the performance of other operations upon boots and shoes, as for instance cleaning or polishing the surfaces of heels or soles.

A very important feature of the invention consists in an arrangement of shoe-engaging members which are adapted for oscillation about the parts of the shoe being treated and also adapted to be rotated while in engagement therewith so as to apply the blacking to said parts, or otherwise act thereon in a very effective manner, and with great rapidity. In connection with this feature of the invention the shoe may be conveniently supported upon a rest in position for action thereon by the said members, and means be provided for adjusting the position of the shoe relatively to the members in such manner that, for example, a heel is being treated the distance traveled by the members in their oscillations about the heel may be the same as the length of the heel, or if desired may be less than its length, according to such adjustment. This enables the operator to control the extent of the area to which the blacking is applied for heels of different sizes, and is an important feature of my invention.

In the embodiment selected for illustration the shoe rest is located between the shoe engaging members, and a fork to embrace the rear or counter portion of the shoe operates with the rest in positioning the shoe heel relatively to said members. The fork and rest are preferably connected and so arranged as to slide in unison in a direction substantially parallel with the path of said members in moving along the sides of the heel, and an adjustable stop is provided to variably limit the extent of rearward movement of the rest and fork. When the stop is adjusted for any given size of heel, the shoe and its rest and fork are moved to the rear, and will automatically be arrested at the desired point to locate the heel in the proper position relatively to the members that apply the blacking thereto, so that the limits of the forward movement of said members will be at, or slightly to the rear of, the heel breast.

Preferably the shoe-engaging members, which are herein shown in the form of brushes are supported in carriers which are arranged for swinging movements about centers located on opposite sides of the shoe support, and the carriers are also arranged to slide along guides which are supported for movement with the carriers about the same centers. Preferably also the brushes are held by yielding means in contact with a suitable cam device, and when a shoe is positioned on the shoe support the yielding means holds them against the heel so that when reciprocated along the guides the brushes will be caused to move in opposite directions about the heel and to follow its contour irrespective of irregularities or differences in size. Means are also provided to impart rotation to the brushes simultaneously with the described oscillating movements, whereby the blacking will be applied thoroughly to every portion of the heel over which the brushes are caused to travel. In the construction herein selected for illustration, rotation is imparted to each of the brushes through a shaft which has connection with its associated brush, and also slidingly engages a gear which is driven from the main power shaft of the machine through a part which also has connection with the brush to oscillate it about the heel. The arrangement of these connections is such that as the sliding shafts are rotated while the brushes are oscillated along the sides and about the rear of a heel said shafts will follow the brushes and impart rotation to them simultaneously with their described oscillating movements.
Another very important feature of the invention consists in an improved means for automatically supplying liquid blacking or other coloring matter to the brushes and for reliably controlling its supply in accordance with the requirements of the work. The blacking is preferably contained in a reservoir and is forced through suitable conduits to the brushes as they travel about the heel of a shoe. Under a convenient construction, a longitudinally bored piston is so connected with each of the brush guides as to be submerged in the liquid blacking, and an adjustable stop or valve is arranged at one end of each piston in position to obstruct, more or less, the escape of the liquid through the same. A cylinder, also submerged in the liquid, is connected with a suitable pipe which supplies the blacking to each brush and the cylinders are arranged to telescope the pistons as the brushes move rearwardly, to thereby force the blacking through the cylinders and the pipes connected therewith to the brushes, in quantities determined by the distance of the stops from the ends of the pistons, said stops being capable of adjustment by the operator, through a handle or other appropriate means. Under this construction a simple and effective arrangement is provided for automatically supplying the liquid blacking in easily controlled quantities, and as each piston and cylinder constituting a blacking-supply device, together with their conduit, are supported for movement about a common center with one of the brushes, it will be seen that as the brushes swing laterally in passing around the rear of a heel the alignment of said piston with its cylinder will be maintained notwithstanding the changes in the position of the brushes. Preferably, the stops referred to for controlling the quantity of blacking supplied to the brushes are in the form of members which are curved on arcs whose centers correspond with those about which the brushes swing, so that the stops in any given adjustment will remain the same distance from the ends of the pistons as they move laterally with the brushes. I regard this also as an important feature of the invention.

Other features of the invention, including important details of construction and combinations of parts, will be hereinafter more particularly described and claimed.

In the drawings, Figure 1 represents, in front elevation, a machine embodying the present invention; Fig. 2 represents a perspective view of the principal operative parts of the same machine, the frame and reservoir being omitted for clearness of illustration; Fig. 3 is a plan view of the machine; Fig. 4 is a detail view showing one of the brushes and the devices for supplying the blacking, together with their operating connections; and Fig. 5 is a sectional detail view, on the line a—a, Fig. 4.

A pedestal 1, which constitutes a part of the main frame of the machine, supports a reservoir 3 to contain the liquid blacking, or any other desired coloring matter. The frame of the machine also supports bearings, one of which is indicated by the numeral 4, for the power shaft 24 which is shown as carrying tight and loose pulleys 5 and 6, to which may be applied a belt for conveying power from a suitable source to the power shaft. The forward end of this shaft is shown as having fast thereon a worm gear 32 which meshes with a worm pinion 33, fast on a shaft 7 which is carried in bearings 8 supported by the frame. The shaft 7 is shown as having at its ends the worm gears 30 which, respectively, mesh with similar worm gears 29, carried at the lower ends of two shafts 35, which are rotatively sustained in bearing sleeves 39, located upon opposite sides of the lower ends of the machine and mounted for turning movements in bearing sleeves 140, which are rigidly connected with the main frame. The sleeves 39 are rigidly connected with horizontal sleeves 139 which have casings to receive worm gears 28 to be driven by worm gears 128 carried by the shaft 33. Shafts 36 slide through bores in the gears 28 and are caused to rotate with the gears by splines 50 which are carried by the gears and enter longitudinal grooves 51 in shafts 36, and the inner ends of these shafts have fast thereon worm gears which mesh with worm gears 52 carried upon the shafts of the brushes 12. Through the described connections, when the shafts 33 are rotated by power derived from the shaft 34, the brushes 12 will likewise be rotated. Each of the brushes comprises a main body of bristles 12, which is adapted to apply blacking to the sides of a heel, and a relatively narrow set of stiffer bristles 43 for entering the crease formed between the counter portion of a shoe and the heel thereof, so as to apply the blacking thereto. The brush parts are mounted on a suitable shaft having at one end the gear 52, and rotatably supported at its opposite end in a guard 16 which is shaped to engage the counter portion of a shoe and to thereby control the position of the brush relatively to the heel. Scrapers 27 having slotted arms 28 for adjustable securing them to the guards 16, are preferably arranged in connection with the brushes for removing the surplus liquid.

The arms 18 which constitute guides for the brushes, are connected at their forward ends rigidly to the sleeved extensions 139, and the brushes are supported for sliding movements on said guides by ways 161, which are herein shown as being rigid with...
the conduits 19 for supplying blacking to the brushes. The upper portions of the conduits are connected with the counter guards 16 by arms 180, and said conduits have horizontal portions which terminate near the brushes 19, and also vertical portions which extend downwardly and are secured at their lower ends to cylinders 15, which cylinders are so located as to be submerged in the liquid blacking in the reservoir 3. To the rear ends of the arms 180 are connected pistons 14, having bores 42 therethrough, and arranged to align with the cylinders 15.

Located in suitable proximity to the rear ends of pistons 14 are two liquid-controlling valves or stops 17, which are curved on arcs whose centers correspond with the axes of shafts 35, about which the supports for the brushes and liquid blacking-supplying devices are arranged to swing. The valves 17 are shown as being connected and are arranged for simultaneous adjustment toward and from the rear ends of the pistons 14 by a slide 170 which is shown as being provided with an angular portion having an internal thread to receive the threaded end of an adjusting rod 58, which extends toward the front of the machine and has applied to its forward end a milled nut, or handle 20. By suitably rotating the nut 20, the valves 17 may be moved varying distances thereby permitting more or less of the blacking to escape from the pistons as the cylinders telescopically reciprocate thereover. By this means the quantity of blacking forced through the conduits 19 on to the brushes may be controlled, at the will of the operator. The brushes are reciprocated along the guides 18 by the reversely arranged crank arms 37 which are carried by the shafts 35 and connected through links 13 with the brushes. As shown herein, the rear end of each link 13 is joined by a pivot 54 to an arm or extension from the conduit 19, although they may be joined to any other portion of the brush carrier, or parts connected therewith.

As explained heretofore, the sleeves 39 are free to turn in their bearings 140 in order that the brushes, their guides, and the blacking supplying devices may be capable of swinging laterally as the brushes travel around the rear curved end portion of a heel, and in conforming to heels of different sizes and shapes. Collars 24, having pins 31 thereon, are secured to the sleeves by screws 45 or other suitable means, and yielding means, as for example spiral springs 22, connect the pins 31 and act to hold the arms 18, the brushes, and other parts sustained by the sleeves 39 inwardly so that the brushes will be heldyieldingly against a cam 38 which is supported rigidly from the frame of the machine. When, however, a shoe is positioned on the shoe support the heel will engage the brushes and the arms will yield outwardly so that the brushes are removed from engagement with the cam and are maintained in engagement with the heel.

The shoe rest or support 11 is shown as being sustained upon a block 44, the support having a longitudinal rib 46 to enter a longitudinal groove in the block and thereby permit the support to move along the block rearwardly in positioning a shoe. The block is also shown as having a downwardly extending stem 47 which is guided in a tube 48 supported from a part of the frame, and located to one side thereof the block carries a depending rod 148 which is threaded for engagement with an internally threaded adjusting nut 21, which may be roughened externally for ease in manipulation. These parts provide for raising and lowering the block and shoe support in order to position the heel of a shoe on the support at the proper height relatively to the brushes. The shoe rest or support 11 carries a downwardly extending pin 11 which slides in an aperture formed in a rod 10. The rod 40 is supported for horizontal movements with the shoe support 11, and to this end its forward portion passes freely through an aperture in an upwardly extending bracket 54 carried by the frame, and its rear portion is similarly guided and supported by a suitable bracket located near the rear of the machine. The rear end of the rod 40 carries an arm 56 which extends in a forward direction beneath a roll 57 whose axle has bearing in brackets supported from a hood 85 which extends over and partly covers the reservoir 3. The arm 56 at its forward extremity carries the fork 10 which is shaped to embrace the rear or counter 105 portion of a shoe and cooperates with the rest or support 11 in positioning the shoe relatively to the brushes. The forward extremity of the rod 40 is shown as being threaded to receive an adjustable stop nut 110, and a spiral spring 26 is confined between the bracket 54 and the nut 25. This spring is normally under a suitable amount of tension, and acts to draw the rod 40, and hence the fork 10 and support 11 toward the 115 front of the machine, and the distance that the rod may move in the opposite direction will be determined by the position of the nut 25 thereon.

Prior to the location of a shoe on the support 11 the springs 22 yieldingly draw the arms 18 inward and hold the brush gear casings 59, which are carried by and extend below the brushes, in contact with the cam 88. When a shoe is placed on the support 11 with its rear portion in contact with the fork 10, the guards 16 will enter the raudchase and be engaged by the adjacent part of the counter. The shoe is then moved to the rear carrying with it the rest 11 and 130.
fork 10, until the rod 40 is arrested by the nut 25, which is ordinarily adjusted to position the heel with its breast in line with the centers of the brushes when they are nearest the front of the machine. The rearward positioning of the shoe causes the brush-carrying arms 18 to move apart and the brushes will then be held yieldingly against the heel. Power being now applied to the shaft 34 by shifting a belt to the tight pulley in the usual manner, the shafts 33 will be caused to rotate and the described connections therefrom to the brushes will cause them to move along the sides and about the rear portion of the heel, and also to rotate during such movements. It will be understood that in traveling about the heel one brush will follow the other, that is, starting with the brushes in the position they are shown as occupying in Fig. 3, the one slightly to one side of the center of the rear end of the heel moves first laterally around the heel to the left and then forward toward the breast, while the other brush moves rearwardly along the right side of the heel until it reaches a position slightly beyond the center of the rear of the heel, and these movements of the brushes are then repeated in the opposite direction.

During the rearward movement of each brush one of the cylinders will move telescopically over its piston and force the liquid blacking through the conduit and onto the brush, in quantities which will be regulated by the position of the valve 17, in the manner above described, a greater quantity of the blacking being forced through the movable cylinders when the valve is located close to the rear end of the pistons so as to obstruct or prevent its escape through the bores 42 than when the valve is moved away from said end and the blacking is thereby permitted to flow freely back into the reservoir.

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

1. In a machine of the class described, the combination with work-engaging members, of means for rotating said members and for causing them to move following each other, first in one direction and then reversely about the heel of a shoe and means for protecting the upper of the shoe from contact with said members.

2. In a machine of the class described, the combination with work-engaging members, of means for rotating said members and for causing them to move following each other from the breast line to the rear of the heel and return on each side thereof.

3. In a machine of the class described, the combination with a shoe support, of work-engaging members and means to oscillate them simultaneously about the edge portion of a shoe on said support, and means to control the extent of the shoe edge traversed by said members.

4. In a machine of the class described, the combination with a shoe support, of work-engaging members arranged for oscillating movements about the edge portions of the bottom of a shoe positioned on said support, means to control the extent of the shoe edge traversed by said members and means for supplying liquid blacking to said members.

5. In a machine of the class described, the combination with a support, of work-engaging members arranged for oscillating movements about a heel on said support, and means to variably control the limits of said movements.

6. In a machine of the class described, the combination with a support, of work-engaging members arranged for oscillating movements about a heel on said support, and means for controlling the relative positions of the heel and said members so that the limits of the forward movements of the members will be substantially in line with the heel breast.

7. In a machine of the class described the combination with work engaging members arranged to act simultaneously on opposite sides of a heel, of means for oscillating said members about the heel and causing their paths of operation to overlap, and yielding means for holding said members in contact with the work.

8. A machine of the class described having in combination, work-engaging members arranged for movement about the heel of a shoe, a cam, and yielding means for holding said members in engagement with said cam.

9. A machine of the class described having in combination, work-engaging members arranged for oscillating movements along the sides and around the heel of a shoe, a cam, and yielding means for holding said members in engagement with said cam.

10. A machine of the class described having in combination, work-engaging members arranged to rotate and to oscillate about a heel, a cam, and yielding means for holding said members in engagement with said cam.

11. A machine of the class described having in combination, work-engaging members, a cam, yielding means for holding said members in engagement with said cam, and means for supporting a shoe in position to move said members out of engagement with said cam.

12. A machine of the class described having, in combination, work-engaging members arranged for oscillating movements, a cam, yielding means for holding said members in engagement with said cam, and
means for supporting a shoe in position to move said members out of engagement with said cam.

13. A machine of the class described having, in combination, work-engaging members arranged to rotate and to oscillate about a shoe, a cam, yielding means for holding said members in engagement with said cam, and means for supporting a shoe in position to move said members out of engagement with said cam.

14. A machine of the class described having, in combination, brushes, counter guards carried thereby, means for causing the brushes to follow each other in oscillating movements about a heel, and yielding means for holding the brushes in engagement with the work.

15. A machine of the class described having, in combination, brushes, counter guards carried thereby, means for imparting rotatory movements to the brushes and for causing them to follow each other in oscillating movements about the work, and yielding means for holding the brushes in engagement with the work.

16. A machine of the class described having, in combination, yielding guides, work-engaging members arranged to reciprocate thereon, and means for holding said members in engagement with the work, and means to reciprocate said members.

17. A machine of the class described having, in combination, a plurality of yielding guides, work-engaging members arranged for movement thereon, means for holding said members in engagement with the work, and means to rotate and reciprocate said members.

18. A machine of the class described having, in combination, pivotedally supported guides, work-engaging members arranged to reciprocate thereon, and means to hold said members in yielding engagement with the work.

19. A machine of the class described having, in combination, a shoe support, guides located on opposite sides of the support and arranged for swinging movements, shoe-engaging members movable on the guides, means to hold said members in yielding engagement with the work, and means for reciprocating said members along the guides to cause them to move about a heel sustained on said support.

20. A machine of the class described having, in combination, a shoe support, guides located on opposite sides of the support and arranged for swinging movements, shoe-engaging members movable on the guides, means to hold said members in yielding engagement with the work, and means to rotate said members and to reciprocate them along the guides to cause said members to traverse the sides and end of a heel on said support.

21. A machine of the class described, having in combination, a shoe support, work-engaging members for operating on a shoe mounted on said support, guides for said members located on opposite sides of said support, and shafts having connection with said members and arranged to impart thereto rotary movements and reciprocatory movements along said guides.

22. A machine of the class described, having in combination, work-engaging members for operating on a shoe mounted on said support, guides for said members located on opposite sides of said support, and shafts having connection with said members and arranged to impart thereto rotary and reciprocatory movements thereto, said guides being supported for pivotal movements.

23. A machine of the class described having, in combination, work-engaging members, guides therefor, and shafts having connection with said members and arranged to impart rotary and reciprocatory movements thereto, means for supporting the guides for pivotal movements about the axes of said shafts, and yielding means for holding said members in engagement with the work.

24. A machine of the class described having, in combination, work-engaging members arranged for simultaneous operation, guides along which said members are arranged for movement, shafts having geared connection with said members, and other shafts arranged to impart rotary movement to the first-mentioned shafts and reciprocating movement to said members.

25. A machine of the class described having, in combination, work-engaging members arranged for simultaneous operation, swinging guides along which said members are arranged for movements, shafts having geared connection with said members, and other shafts arranged to impart rotary movement to the first-mentioned shafts and reciprocating movement to said members.

26. A machine of the class described having, in combination, work-engaging members arranged for simultaneous operation, swinging guides along which said members are arranged for movements, shafts having geared connection with said members, other shafts arranged to impart rotary movement to the first-mentioned shafts, and reciprocating movement to said members, means for supporting said guides for pivotal movement about said last-mentioned shafts, and yielding means to hold said members in engagement with the work.

27. In a machine of the class described, the combination of work-engaging members, guides along which said members are arranged for movement, shafts having geared connection with said members, other shafts arranged to impart rotary movement to the first-mentioned shafts, and reciprocating movement to said members, means for supporting said guides for pivotal movement about said last-mentioned shafts, and yielding means to hold said members in engagement with the work.

28. In a machine of the class described, the combination of work-engaging members, guides along which said members are arranged for movement, shafts having
geared connection with said members, means, including gears through which said shafts slide for imparting rotation thereto, other shafts having driving connection with said gears, and means connecting the last-mentioned shafts and said members to effect reciprocating movement of the members.

29. In a machine of the class described, the combination of a reservoir to contain liquid, a brush arranged to traverse the parts to be treated, and means actuated by the movement of the brush to forcibly supply the brush with liquid.

30. In a machine of the class described, the combination of a reservoir to contain liquid, a brush arranged to traverse the parts to be treated, means actuated by the movement of the brush to supply liquid directly to the brush, and means to control the quantity of liquid supplied.

31. In a machine of the class described, the combination of a reservoir, a brush arranged to traverse the parts to be treated, and forcing devices located in said reservoir arranged to be actuated by movement of the brush to supply the brush with liquid.

32. In a machine of the class described, the combination of a reservoir, a brush arranged to traverse the parts to be treated, and a pump in said reservoir arranged to be actuated by movement of the brush to supply the brush with liquid.

33. In a machine of the class described, the combination of a reservoir, a brush arranged for reciprocating movement, liquid forcing means in said reservoir arranged to be actuated by movement of the brush, and a conduit connecting said means with the brush.

34. In a machine of the class described, the combination of a reservoir, a brush arranged for reciprocating movement, a conduit supported for movement with the brush and carrying a liquid forcing member located in said reservoir, and a second member in the reservoir connected to cooperate with the first-mentioned member in supplying liquid to the brush.

35. In a machine of the class described, the combination of a reservoir, a brush arranged for reciprocating movement, a cylinder movable therewith, and a piston arranged to be telescoped by said cylinder to supply liquid to the brush.

36. In a machine of the class described, the combination of a reservoir, a brush arranged for reciprocatory and swinging movements, a cylinder movable with the brush, and a piston fixed relatively to the reciprocatory movement of the brush but arranged to swing therewith so as to be maintained in alinement with said cylinder in all positions of the brush.

37. In a machine of the class described, the combination of a reservoir, a brush, a guide along which said brush is arranged to reciprocate, pivotal means to support said guide, a cylinder movable with the brush, and a piston supported from said guide in position to be telescoped by said cylinder.

38. In a machine of the class described, the combination of a reservoir, a brush, a guide for the brush, pivotal means to support said guide, a cylinder movable with the brush, a piston supported from the guide, and means to cause the brush to reciprocate, said guide and brush being also arranged to swing laterally, and the piston being maintained in alinement with the brush during said movements.

39. In a machine of the class described, the combination of a reservoir, a piston therein provided with a passage, a reciprocatory brush carrying a cylinder to telescope said piston, and means to control the escape of liquid through said passage.

40. In a machine of the class described, the combination of a reservoir, a piston therein having a passage, a reciprocatory brush, a conduit supported by the brush and carrying a cylinder in the reservoir to telescope said piston, and an adjustable stop arranged to obstruct the escape of liquid from said passage and thereby to control the quantity of liquid supplied to the brush.

41. In a machine of the class described, the combination of a reservoir, a shoe support, swinging guides on opposite sides of the support, apertured pistons supported from the guides in said reservoir, brushes arranged to move along and swing with said guides, conduits supported from the brushes and carrying cylinders to telescope said pistons, and an adjustable waste controller positioned near the outer ends of the pistons constructed to occupy a fixed distance from the pistons as they swing with the guides.

42. In a machine of the class described, the combination with a shoe support, of 110 brushes arranged for movement about the support in substantially the plane of the shoe bottom, and means permitting longitudinal movement of the support relative to said brushes to vary the amount of surface of the work to be engaged by the brushes.

43. In a machine of the class described, the combination with a shoe support, of a fork to position the rear portion of a shoe on said support, brushes arranged for movement about the support in substantially the plane of the shoe bottom, and means permitting longitudinal movement of the support and fork relative to said brushes.

44. In a machine of the class described, the combination with a shoe support, of brushes arranged for movement about the support, means permitting longitudinal movement of the support, and means to adjustably limit the extent of such movement.
45. In a machine of the class described, the combination with a shoe support, of brushes arranged to oscillate about the support, a fork to position the rear portion of a shoe on said support, means connecting the fork and support permitting their simultaneous longitudinal movement, and means to adjustably limit the extent of said movement.

46. In a machine of the class described, the combination with a shoe support, of brushes arranged to oscillate about the support, a fork to position the rear portion of a shoe on said support, means connecting the fork and support permitting their simultaneous longitudinal movement toward and from the brushes, and a yielding device to restore said parts to normal position.

47. In a machine of the class described, the combination with a shoe support sustained for longitudinal movement, of brushes arranged to oscillate about the support, a fork to position the rear portion of a shoe on the support, a rod connecting said support and fork, a bracket in which the rod is supported for sliding movement, an adjusting nut having threaded engagement with the rod, and a spring between said bracket and nut.

48. In a machine of the class described, the combination with a shoe support sustained for longitudinal movement, of brushes arranged to oscillate about the support, a fork to position the rear portion of a shoe on the support, a slidable rod connected with said fork, means connecting said support and rod permitting vertical adjustment of the support, and means to effect such adjustment.

49. In a machine of the class described, the combination of work engaging members for operating on opposite edges of a shoe bottom and means for producing relative movement of the shoe and said members to cause the point of operation of each member to travel along the edge of the shoe bottom on one side to a point on the other side of the median line of the shoe bottom at its end.

50. In a machine of the class described, the combination of work engaging members for operating on opposite edges of a shoe bottom, means for producing relative movement of the shoe and said members to cause the point of operation of each member to travel along the edge of the shoe bottom to a point past the median line thereof at its end and means for varying the extent of said travel along the sides of the shoe bottom.

51. In a machine of the class described, the combination of work engaging members for operating on opposite edges of a shoe bottom, means for rotating said members and means for producing relative movement of the shoe and said members to cause the points of operation of said members to be transferred along the side edges of the shoe bottom and to overlap at the end of the shoe bottom.

52. In a machine of the class described, the combination of work engaging members for operating on opposite edges of a shoe heel and means for oscillating said members along the heel edge and causing their paths of operation to overlap at the rear end of the heel.

53. In a machine of the class described, the combination of work engaging members for operating simultaneously in opposite directions on the edges of a shoe bottom, means for producing relative movement of the shoe and said members to cause the points of operation of the members to be transferred along the edges of the shoe bottom, means for protecting the upper of the shoe from contact with said members and means for supplying said members with liquid.

54. In a machine of the class described, the combination of work engaging members for operating on opposite edges of a shoe bottom, means for producing relative movement of the shoe and said members to cause the points of operation of the members to travel along the edges of the shoe bottom to and overlap at the end of the shoe bottom and driven means for feeding liquid finishing material to said members.

55. In a machine of the class described, the combination of a reservoir to contain liquid, a brush, and actuating mechanism to cause the brush to move bodily over the surface of the work, and means actuated by the brush in said movement to effect a supply of liquid to the brush.

56. In a machine of the class described, the combination with work engaging members, of means for rotating said members and for causing them to follow each other in oscillating movements about the edge of a heel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FREDERICK M. FURBER.

Witnesses:

JOHN H. McCREADY,
JAMES R. HODDER.