

G. L. ROLLINS.
HEEL BLACKING MACHINE.
APPLICATION FILED SEPT. 12, 1907.

1,056,454.

Patented Mar. 18, 1913.

2 SHEETS-SHEET 1.

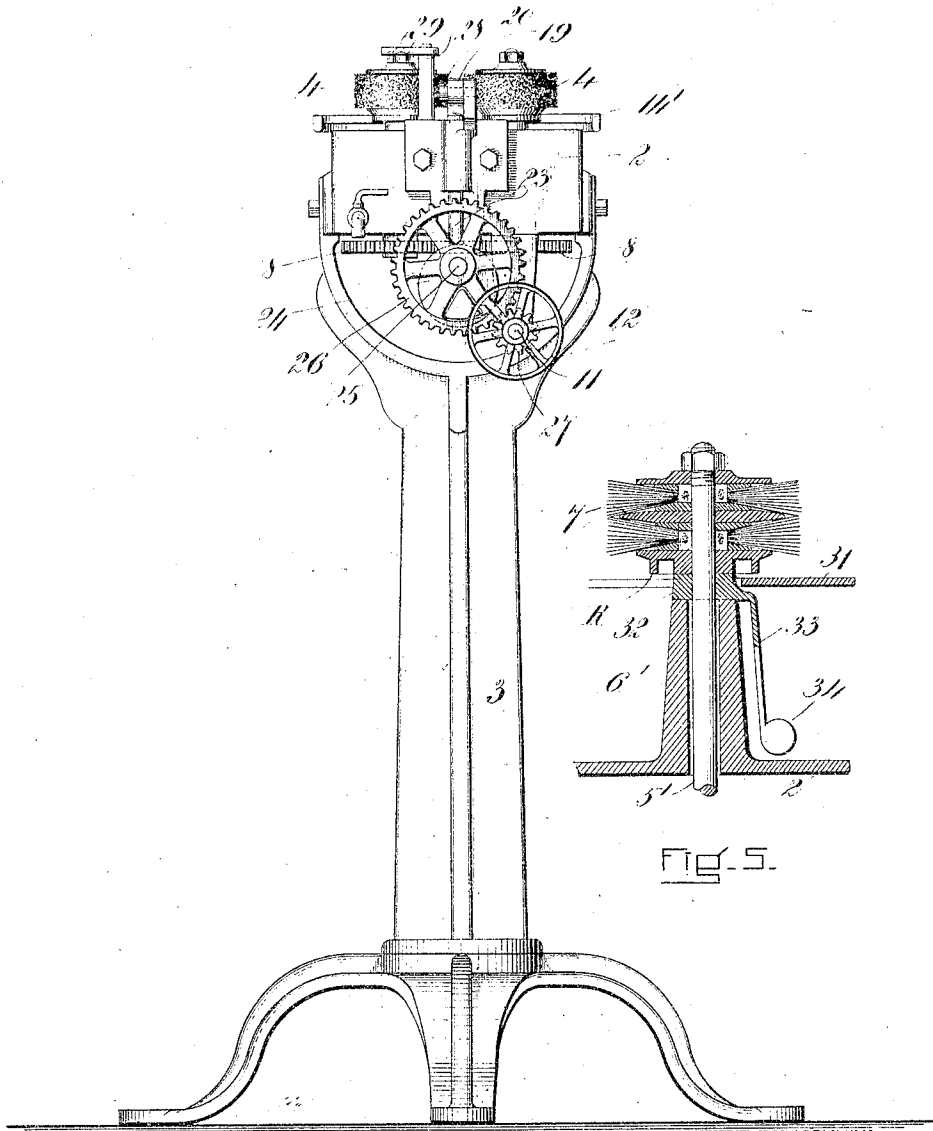


FIG. 1.

WITNESSES:
Joseph Becker
C. S. Wadsworth

INVENTOR:
George L. Rollins

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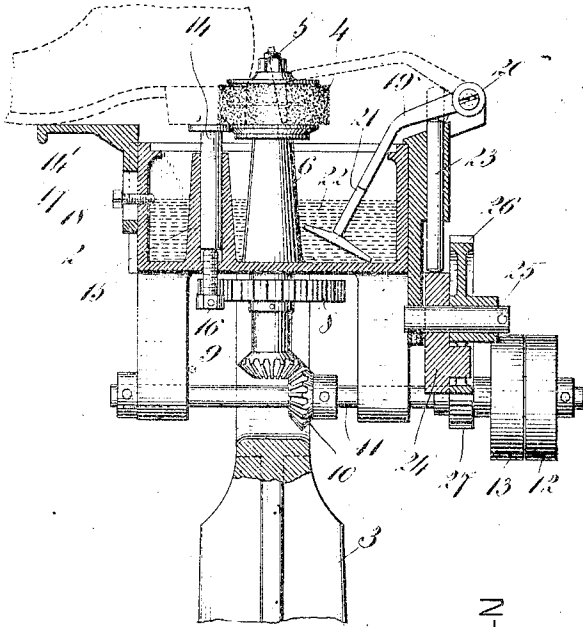


Fig. 2.

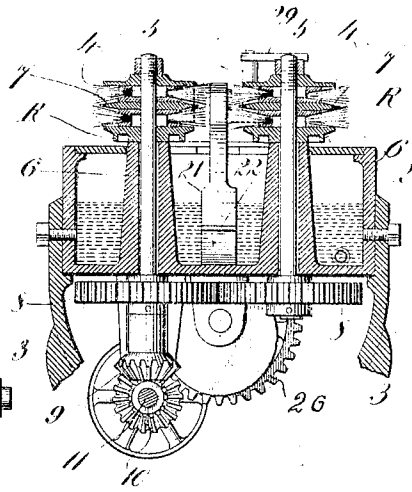


Fig. 3.

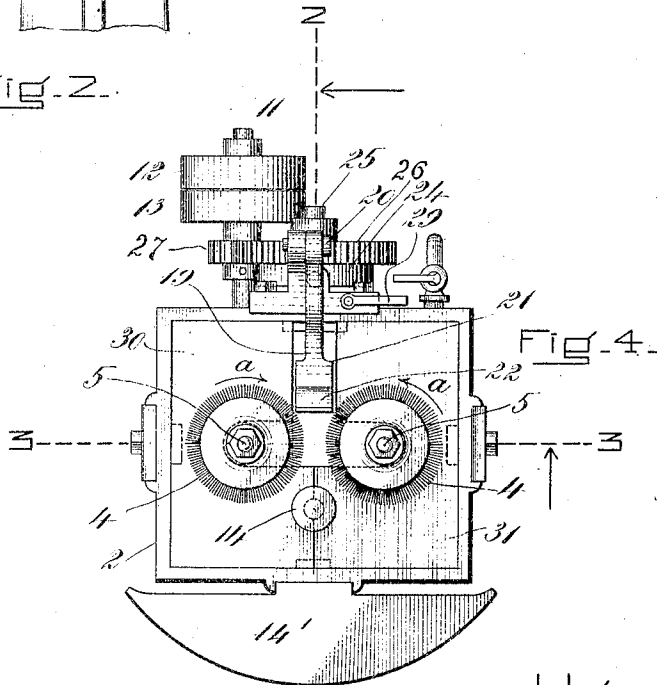


Fig. 4.

WITNESSES=
 Joseph Barker
 C. D. Woodbury

INVENTOR=
 George L. Rollins

UNITED STATES PATENT OFFICE.

GEORGE L. ROLLINS, OF BRIDGEWATER, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

HEEL-BLACKING MACHINE.

1,056,454.

Specification of Letters Patent.

Patented Mar. 18, 1913.

Application filed September 12, 1907. Serial No. 392,565.

To all whom it may concern:

Be it known that I, GEORGE L. ROLLINS, a citizen of the United States, and resident of Bridgewater, in the county of Plymouth and State of Massachusetts, have invented certain new and useful Improvements in Heel-Blackening Machines, of which the following is a specification.

This invention which relates to machines for use in the manufacture of boots and shoes has for its broad object to provide a practical machine for applying finishing material, such, for example, as blacking or stain, and which will be herein referred to as "blacking" for the purpose of designation, to the edges of the shoe bottom, particularly to the edges of the heel and the heel portion of the sole. Prior to this invention the practice has been to apply blacking with a hand brush of the tooth brush type which was dipped into a pan of blacking and rubbed over the heel edge to apply and spread the blacking, the shoe being held in one hand while the brush was held in the other hand. Of course the most blacking was applied to the side of the heel first touched by the brush and as it was a boy's job the distribution of the blacking was usually imperfectly and carelessly effected and accompanied by a considerable daubing of the upper and of the tread and breast faces of the heel. A larger quantity of blacking than necessary was used because of the uneven distribution and the blacking was of non-uniform consistency on different shoes because blacking comprises coloring matter and wax which are held in suspension in the liquid and settle rapidly so that constant stirring is necessary in order to maintain a uniform consistency. In practice the boy stirred the blacking with a stick when he thought of it or when the portion into which he dipped his brush became so far from normal as to attract his attention. This obviously resulted in a non-uniform finish being obtained and also in the caking or drying of quantities of the blacking on the sides of the pan which causes a material waste of stock.

Attempts have been made to produce machines for blacking the long narrow edges of soles and it has sometimes been suggested that these proposed machines could also be employed for blacking heel edges. The designs for those machines have particular

reference to sole edge work and no machine has heretofore been produced so far as I am aware that has succeeded in displacing hand work in blacking heels.

A broad characteristic feature of the present invention is found in the use of two brushes and means for supplying each with blacking, said brushes being arranged to apply blacking to the two side edges of a heel at the same time and to permit the shoe to be manipulated to present the entire length of the outer edge of the heel in position to be coated. With this arrangement the operator can cause the heel to be uniformly coated with blacking throughout the length of its side and rear edges merely by moving the heel between the brushes, and turning it to one side or the other while in contact with the brushes. With a machine having this arrangement, an operator can effect very rapid presentation of shoes and can coat a heel edge more quickly and much better than a workman does by dipping up blacking with a brush and wiping the brush around the heel.

Other features of the invention provide for a reliable feeding of wax blacking which shall not be deranged by the caking of the wax blacking in the feeding apparatus, and for a more uniform distribution of the blacking than is obtained by hand work; for directing the presentation of the shoe so that the blacking will be applied only on the heel edge without daubing or wasting blacking upon other portions of the shoe, including means for varying angularly the plane in which the shoe is presented with relation to the plane in which the brushes rotate, whereby properly to direct pitched heels in their presentation to the brushes; and for a mechanical stirring of the blacking in a closed tank to keep the heavy elements from settling and prevent drying or caking.

The several features of the invention including certain details of construction and combinations of parts will now be described in connection with the drawings which show a preferred construction embodying the invention, and will then be more particularly pointed out in the claims.

Figure 1 is a rear elevation of the complete apparatus; Fig. 2 is a section through the same, taken on the line 2—2 in Fig. 4, with the lower portion of the supporting frame omitted; Fig. 3 is a section taken on

the line 3—3 in Fig. 4; Fig. 4 is a top plan view of the apparatus; and Fig. 5 is a sectional detail showing a slight modification.

As preferably constructed and as illustrated in the drawings, my apparatus comprises a tank 2 supported on the upper end of a stand or base piece 3 and adapted to hold a quantity of liquid blacking, above which tank and preferably directly over it are located two similar rotary brushes 4, side by side and at a little distance apart, each brush being secured to the upper end of a vertical spindle 5 journaled in a bearing 6 which extends upward from the bottom of the tank to a point above the level of the liquid contents of the same. The brushes 4 are preferably constructed under my prior United States Letters Patent No. 743,929 for apparatus for applying cement, granted on the 10th day of November, 1903, according to which patent a brush is provided in addition to its applying portions, which may comprise bristles, with an unyielding annular disk. In the new design of these brushes for the shoe blacking machine the outer edge of the annular disk 7 is located a short distance within the periphery of the mass of bristles, and is made to serve as a gage or shoe positioning device. In the present case also the outer ends of the bristles which are located on opposite sides of the disk 7 preferably meet or come together over the periphery of the disk, so that the brush is operative as such over its entire width. As shown, the bristles adjacent to the disk are inclined theretoward for this purpose, and the disk tapers in thickness near its periphery. It will be seen that with this arrangement the bristles which are bent backwardly by contact with the heel will yet cover the trail of the gage on the heel so that the entire width of the heel edge will be coated with blacking. It will also be observed that in this invention in which the brushes are arranged on vertical axes instead of horizontal axes the gage 7 is located below a portion of the bristles so that the blacking from the bristles above it can flow down the heel and cover the trail of the gage. This is particularly important after the bristles become worn too short to meet behind the gage. In the new use the disk 7 also serves as a dam to retard the drainage of the blacking downwardly from the upper bristle section to the lower section thus assisting to insure an abundance of blacking for the upper portion and rand crease of the heel.

At their lower ends the brush spindles 5 are provided with means whereby they are simultaneously rotated at the same speed but in opposite directions, such as intermeshing gears 8 secured to said spindles respectively, one of the spindles being extended downward and provided with a pinion 9

meshing with another pinion 10 which is secured to the main driving shaft 11. Said driving shaft is suitably journaled in the framework of the apparatus and provided with fast and loose pulleys 12 and 13, or otherwise adapted to be driven from any suitable source of power, and is so operated that the brushes 4 rotate in the directions indicated by the arrows *a* in Fig. 4.

For supporting and guiding the work I provide a vertical headed post 14 and a horizontal plate 14', said post being mounted to permit it to turn in a bearing 15 extending upwardly from the bottom of the tank 2 and located in position to support the heel of a boot or shoe adjacent to both the brushes, as indicated in Figs. 2 and 4. The horizontal plate 14' is carried by the side of the tank 2 and is formed to extend laterally in both directions, so that it supports and guides the shoe as it is introduced between the brushes and as it is turned to present the rear end in position to be coated with blacking. The post 14 is preferably made vertically adjustable, as by supporting it on one end of a threaded bolt 16, and the plate 14' is also made vertically adjustable by providing it with a vertical slot 17 through which a clamping bolt 18 passes into the front of the tank.

For feeding or transferring the blacking from the tank 2 to the brushes I employ an intermittently operating lifting device preferably consisting of an arm 19 pivoted as at 20 to move in a vertical plane, transverse to the plane of rotation of the brushes, and provided at its free end with a paddle-shaped portion 21, which is so located that when said arm is raised the portion 21 will pass between the brushes 4 and extend across the space which separates them, so that its edges will come into contact with the bristles of both brushes at or near the upper edge of each brush. The extreme front end of the portion 21 is also provided, by preference, with a flat head or blade 22 of the same width as the portion 21 and arranged to extend in a substantially vertical direction when located between the brushes, as shown in dotted lines in Fig. 2, and the arm 19 is alternately raised into the position just referred to and lowered into the blacking in the tank by suitable means such as a lifting pin 23 mounted to slide vertically in the framework of the machine and resting at its lower end on a cam 24 secured to a countershaft 25, the latter being provided with a gear 26 which meshes with a pinion 27 secured to the driving shaft 11.

As thus constructed the operation is as follows: The brushes 4 are continuously rotated and the free end portion of the arm 19 is periodically dipped into the blacking and raised out of the same into the position shown in dotted lines in Fig. 2, in which the

lower portion of the blade 22 is located between and in contact with the ends of the bristles. As the portion 21 rises it carries up with it a small quantity of the blacking, which runs over the side edges of the same and is removed by the brushes as said portion passes between them, the vertical blade 22 serving as a scraper or stripper to distribute the blacking uniformly over the ends of the bristles. The blacking thus taken up by the bristles is applied in turn to the heel of the boot or shoe being operated upon, which is advanced by the operator over the supports 14 and 14' and turned laterally from one side to the other on the plate 14' so that all parts of the outer edge of the heel are brought into contact with one brush or the other. The heel thus receives a sufficient layer of blacking, the application of any excess of blacking being prevented by the scraping action of the blade 22 which strips the bristles of any drops of blacking that they may have taken from the feeder and returns the surplus blacking to the tank. It will be observed that the scraper or stripper does not act continuously so as constantly to take off blacking but only intermittently. The feeder lifts a charge of blacking and much of it flows off upon the upper portion of the brush over the acting face of which it flows downwardly to charge the entire brush. The edges of the head 22 strip the surplus from any overcharged portion of the brush and this stripped blacking flows by gravity down the vertical edge of the scraper face to be taken up by any insufficiently charged portion and finally if any surplus remains it drains directly back into the tank. During any prolonged interval between the presentation of shoes this back drainage is substantially equal to the feed. The regularly repeated feeding and stripping keeps the brushes always charged with fresh blacking and gives no opportunity for the bristles to become caked with blacking notwithstanding the constant motion of the brush tends to cause rapid evaporation from the bristles. Centrifugal action keeps the blacking on the end portions of the bristles and prevents the body of the brush from loading with blacking which would dry and cake about the hub. An advantage in this respect, as well as in many others, is obtained by mounting the brushes on vertical axes because there is much less tendency for the blacking to work into the inner portion of the brush and dry there than there would be if the brushes rotated in a vertical plane. This will be appreciated when it is remembered that these brushes must, in order to prevent them from throwing blacking, be rotated at a much lower speed than would be possible with polishing brushes or brushes that carried viscid material such as cement, and the cen-

trifugal action is of course relatively less in the blacking brushes. The gearing connecting the brushes and the feeder is shown as arranged to cause the feeder to make one reciprocation to three revolutions of the brush, and the cam 24 that raises the feeder is nearly a plain eccentric and holds the arm 19 substantially at rest in feeding and stripping position for about one revolution of the brush. This permits the whole periphery of the brush to load up and to pass under the stripper for removal of excess at each feeding operation. The vertical stripper, made possible by the mounting of the brushes on vertical axes, not only removes excess of blacking from any overloaded portion of the brush but conveys the excess downwardly in a course where it can be taken up by any insufficiently supplied lower portion of the brush. The intermittently acting stripper retires after each stripping operation and so remains in contact with the brush only about a third of the time, thus saving needless wear on the bristles of the brush. By reason of the fact that the stripper, as well as the feeder 21, dips at frequent intervals into the body of blacking, which is kept in constant motion in the tank by the stirrers, the tendency of the blacking to dry and cake on the parts is greatly reduced. The forepart rest 14' in combination with the heel rest 14 assists the operator in positioning the shoe angularly in the right plane and guides him in turning the shoe thus enabling him to do faster and better work. By adjusting the rests 14, 14' the heel can be positioned according to its height so that the upper bristles will not daub the upper with blacking. By relatively adjusting the forepart and heel tread rests they can be made to support the shoe at an angle to the plane of rotation of the brushes. The rear end of the heel can thus be tipped downwardly when that end is pitched or inclined and so presents to the brushes a vertically wider edge to black than the sides of the heel present, as is characteristic for example of "Cuban" heels. The brushes should be caused to rotate in the directions indicated by the arrows *a* in Fig. 4 or in other words, in contact from the rear toward the breast of the heel since otherwise the breast of the heel would be spotted at its side edges by scraping blacking from the bristles. The arrangement of the brushes in close proximity and their rotation in the direction stated with the stripper or scraper 22 behind them provides that each brush shall receive any spatter that comes from the other brush as it wipes past the stripper or scraper. The disks 7 serve as gages to limit the movement of the heel backwardly as it is introduced between the brushes and also locate the heel laterally by limiting its approach toward the axis of each brush so that

the application of the blacking is confined to the desired surface and rendered uniform. The brushes are located at a higher level than the tank, and as shown directly over it, so that any surplus blacking that may be stripped from the brushes by the stripper blade 22 will drain back into the tank. To prevent the blacking from running from the brush into the bearing 6 the under plate of the brush is provided with a circumferential rib R.

It will be seen that by means of the apparatus above described, it is possible to black the heels of boots and shoes with great uniformity and that the construction is such that it is unlikely to apply an excessive quantity of blacking or for the apparatus to become clogged or otherwise rendered inoperative or ineffective in any way. The feeding device for the blacking may be variously modified without departing from my invention and various other changes may be made in the illustrated machine as will be evident. For example, some of the advantages of the invention could probably be obtained if only one brush were employed; also other devices than brushes may be employed for taking the blacking from the transferring device and applying it to the work. In this connection I could state that while the applying device is usually termed a "brush," in the claims it should be understood that where the context and the art permit the term should be understood to cover any applying device that could be used instead of a brush.

In order that the brushes may be readily cleaned from time to time, the apparatus may be provided with means for holding the arm 19 in the position shown in dotted lines in Fig. 2, that is to say, with the lower portion of its head located between the brushes. If this is done and the brushes are caused to rotate, (preferably at a higher speed than usual) the head will act as a scraper to pulverize and remove such blacking as may have dried upon the bristles and thus clean the brush in an obvious manner. For holding the arm in the position above referred to, I have shown the apparatus as provided with a vertical post 28, Figs. 1 and 4, which extends upward from the rear edge of the tank and is provided at its upper end with a horizontal finger 29 which may be turned laterally into a position beneath the arm when the latter is raised, in which position it will support said arm as above described. The elevation of the arm in this manner will evidently not interfere in any way with the rotation of the brushes or with the operation of the stirrers associated with the brushes which continue in motion all the time and keep the blacking always properly mixed, and ready to be taken up by the feeder whenever the opera-

tion of the latter is resumed. I also prefer to provide the tank 2 with a removable cover which will substantially prevent the drying of the blacking, such a cover being shown in plan view in Fig. 4 as composed of two similar parts 30, 31 adapted to rest on the upper edge of the tank 2 and provided with notches to receive the brushes and permit the movement of the arm 19.

In Fig. 5 I have shown a slight modification according to which each of the spindles 5' is provided at the upper end of its bearing 6', and beneath the corresponding brush, with a collar 32 which carries an arm 33 extending outward and downward nearly to the bottom of the tank where it is provided with a head 34 adapted to serve as a continuously moving stirring device driven from the brush to agitate the blacking in the tank and keep the consistency of the same uniform, a result which is secured in part by the intermittent movement of the arm 19 above described. The stirrers in their rotation about the respective brush bearings sweep the blacking from opposite directions toward the feeding device. The movement of the stirrers, being derived from the brushes, is rapid enough to keep the blacking in the tank constantly in motion and prevent the heavy elements of the blacking from settling. The feeder also assists in stirring the blacking but its motion is relatively slow for it must not splash the blacking as it descends into it. Moreover there is no advantage in a rapidly moving feeder when a separate stirrer is employed and an advantage is gained in the illustrated machine by permitting the feeder to pause in delivering position for a substantial period to permit the rotating brushes to load up with blacking. The feeder breaks up or changes the current produced by the stirrers and thereby renders the stirrers more effective.

It may be well to emphasize the fact that a characteristic of my machine as distinguished from prior attempts in blacking machines is to be seen in that in the older devices the blacking was fed to the brushes through an aperture or other concavity which was rapidly choked up and rendered inoperative owing to the caking tendency of the blacking; whereas, in my invention the blacking is conveyed to the brushes by means which will give a constant and uniform supply such as a paddle or the like which moves past the ends of the bristles and upon which the wax might build up a considerable extent without interfering with the operation of the machine and from which any wax that might accumulate can be readily removed.

Having explained the nature of this invention and described a preferred construction embodying the same in the best form

known to me but without attempting to point out the many other embodiments and modifications of which the broad invention is capable, I claim as new and desire to secure by Letters Patent of the United States:

5 1. In a heel blacking machine, the combination of a tank adapted to contain a quantity of liquid material, a material applying device mounted to rotate on a vertical
10 axis and means for rotating the same, a material-lifting device adapted to be dipped into the material within the tank and to be moved out of the same and upward past and simultaneously in delivering relation to the applying device, and means for operating
15 said lifting device.

2. In a heel blacking machine, the combination of a tank adapted to contain a quantity of liquid material, a brush mounted to rotate on a vertical axis, means for
20 rotating said brush, a paddle adapted to be dipped into the material within the tank and to be lifted out of the same and moved upward past and simultaneously in contact with the brush, and means for operating
25 said paddle.

3. In a machine of the character described, the combination of a tank, a pair of brushes mounted to rotate on vertical
30 axes side by side, means for simultaneously rotating said brushes, and means for transferring liquid material from the tank to the brushes, comprising a paddle adapted to dip into the material within the tank and to be
35 lifted out of the same and moved upward past the brushes, and means for operating said paddle.

4. In a heel blacking machine, the combination of a tank adapted to contain a quantity of liquid material, a brush mounted to rotate on a vertical axis, means for
40 rotating said brush, a material-transferring device arranged to dip into the material within the tank and to travel transversely of the plane of rotation of the brush past and simultaneously in delivering relation to the periphery of the brush, and means for operating said transferring device.

5. In a machine of the character described, the combination of a tank, a pair of brushes mounted to rotate on vertical axes and located side by side and at a little distance apart, means for simultaneously rotating
50 said brushes, a material-transferring device arranged to dip into the material within the tank and to travel between and in delivering proximity to the peripheries of said brushes, and means for operating said transferring device.

6. In a machine of the character described, the combination of a pair of brushes and means for simultaneously rotating the same in opposite directions, said brushes being provided with gages cooperating with
65 one another to determine the relation in

which the work may be presented between the two brushes, work-supporting means on which the work may be advanced between the brushes and brought into simultaneous contact with said gages, and means for applying liquid material to both of said
70 brushes.

7. In a machine of the character described, the combination of a pair of circular brushes mounted to rotate on parallel axes, side by side, and means for rotating the same simultaneously, a gage cooperating with each brush to limit the movement of the work toward its axis, means for supplying liquid material to said brushes, and a work support located opposite and in proximity to the space between the brushes and adjustable in the direction of their axes.

8. A machine of the character described comprising a tank, a pair of brushes located above the same, at a little distance apart, means for simultaneously rotating said brushes in opposite directions, a transferring device adapted to dip into the material within the tank and to discharge between
85 said brushes, and means for operating said transferring device.

9. A machine of the character described comprising a tank, a pair of brushes located above the same, at a little distance apart, means for simultaneously rotating said brushes in opposite directions, a pivoted arm having its free end adapted to dip into the material within the tank and to move out of the same into the space between said
90 brushes, and means for raising and lowering said arm.

10. A machine of the character described comprising a tank, a circular brush and means for rotating the same, a paddle arranged to be dipped into material within the tank and to be moved upward above the periphery of the brush, said paddle being provided with a blade adapted to engage the ends of the bristles, and means for operating
105 said paddle.

11. A machine of the character described comprising a tank, a brush located above the same and means for operating said brush, a pivoted arm provided at its free end with a scraping blade adapted to dip into the material within the tank and to move out of the same into contact with the brush, and means for lowering and raising said arm, said machine having provision
115 for holding said arm in elevated position.

12. A machine of the character described comprising a tank, a pair of brushes located above the same, at a little distance apart, and mounted to rotate on vertical axes, means for simultaneously rotating said brushes in opposite directions, a pivoted arm provided at its free end with lifting and scraping portions adapted to dip into the tank and to move out of the same into
125 130

the space between the brushes, and means for raising and lowering said arm.

13. A machine of the character described, comprising a tank, a pair of brushes located
5 above the same, at a little distance apart, and mounted to rotate on vertical axes, means for simultaneously rotating said brushes in opposite directions, a pivoted arm provided at its free end with lifting and
10 scraping portions adapted to dip into the tank and to move out of the same into the space between the brushes, means for raising and lowering said arm, and means for supporting the work in contact with said
15 brushes.

14. In a machine of the character described, the combination of a tank adapted to contain liquid material, a pair of brushes mounted to rotate on vertical axes, side by
20 side, means for simultaneously rotating said brushes, and means for lifting the liquid material out of said tank and applying the same to each of the brushes.

15. In a machine of the character described, the combination of a tank adapted to contain a liquid material, a pair of brushes mounted to rotate on vertical axes,
25 side by side, means for simultaneously rotating said brushes, means for transferring the liquid material from said tank to each of the brushes, and vertically-adjustable means for supporting the heel of a shoe in a position to be acted upon by both of said
30 brushes simultaneously.

16. In a machine of the character described, the combination of a tank adapted to contain liquid material, a pair of brushes mounted to rotate on vertical axes, side by
35 side, means for simultaneously rotating said brushes, means for lifting the liquid material out of said tank and applying the same to each of the brushes, and means to position a heel relatively to the brushes.

17. In a machine of the character described, the combination of a tank adapted to contain liquid material, a pair of brushes mounted to rotate on vertical axes, side by
45 side, means for simultaneously rotating said brushes, means for lifting the liquid material out of said tank and applying the same to each of the brushes, means for supporting the heel of a shoe in position to be acted upon by both of said brushes simultaneously, and means for holding the periphery of the heel at a pre-determined distance from the
50 axes of both brushes during its turning movements on its support.

18. A heel blacking machine having, in combination with suitable means for supplying blacking, two applying brushes arranged relatively to apply blacking to opposite side edges of a heel as the heel is moved endwise between them and to permit
55 the shoe to be turned while in contact with the brushes to present the entire length of

the outer edge of the heel to the blacking brushes, and heel and sole tread rests arranged to guide the shoe during said endwise and turning movement of the shoe.

19. A heel blacking machine comprising,
70 in combination, a tank for holding blacking, two vertical bearing columns rising from the floor of the tank, rotary brushes arranged side by side on vertical shafts journaled in said bearings and in position to engage opposite sides of a heel simultaneously, and
8 means for feeding blacking from the tank to the brushes.

20. A heel blacking machine comprising, in combination, two rotary bristle brushes arranged on vertical axes side by side and spaced apart to permit the partial introduction of a heel between them, means for delivering blacking to said brushes and unyielding stops associated with the two
85 brushes and arranged to limit the extent to which a heel can be introduced between the brushes.

21. A heel blacking machine comprising, in combination, two rotary brushes for applying blacking arranged side by side and spaced apart to permit the partial introduction of a heel between them, means for delivering blacking to said brushes and devices associated with said two brushes but
95 additional to their working faces to locate the heel laterally between the brushes.

22. A heel blacking machine comprising, in combination, two rotary bristle brushes arranged on vertical axes side by side and spaced apart to permit the partial introduction of a heel between them, and plates projecting radially from the brush shafts a less distance than the bristles to engage the shoe on opposite sides and limit the extent
100 to which the heel can bend the bristles of each brush in its movement between the brushes.

23. A heel blacking machine comprising, in combination, two rotary bristle brushes arranged on vertical axes side by side and spaced apart to permit the partial introduction of a heel between them, means for delivering blacking to said brushes and disks arranged between the upper and the lower
110 bristles of each brush in position to engage the sides of the heel for limiting the introduction of the heel between the brushes.

24. A heel blacking machine comprising, in combination, two rotary bristle brushes arranged on vertical axes side by side and spaced apart to permit the partial introduction of a heel between them, and disks arranged between the upper and the lower bristles of each brush in position to engage
120 the sides of the heel for limiting the introduction of the heel between the brushes, said upper and lower bristles being arranged to meet outside the disk and present normally an uninterrupted bristle face.

25. A heel blacking machine having, in combination, two rotary brushes positioned adjacent to each other for coating simultaneously the opposite sides of a heel introduced between them, and two thin plates carried respectively by said brushes and arranged to engage the opposite sides of the heel to limit its introduction between the brushes, the bristles of each brush extending radially beyond the plate carried thereby and being inclined toward it to apply blacking to the heel edge behind the point at which the plate engages the heel.

26. A heel blacking machine having, in combination, two rotary brushes arranged on vertical axes to permit a heel to be introduced between them for simultaneously applying blacking to two sides of the heel, and a disk carried by each brush and limiting the extent to which the bristles can be bent back by the work, each disk being located below a portion of the bristles so that the blacking deposited on the heel above it can flow down and obliterate its trail on the heel edge.

27. A heel blacking machine having, in combination, a tank, a rotary brush on a vertical axis and located over the tank where surplus blacking can drain from the brush into the tank, and means for lifting the blacking from the tank and applying it to the brush.

28. A heel blacking machine having, in combination, a tank for holding blacking, a rotary brush on a vertical axis and located on a higher level than the maximum height of the blacking in the tank, feeding means for the blacking, and means arranged to strip surplus blacking from the brush and return it to the tank.

29. A heel blacking machine having, in combination, a tank for holding blacking, a rotary brush on a vertical axis and located on a higher level than the maximum height of the blacking in the tank, and intermittently operating feeding and stripping means arranged to present blacking to the upper portion of the brush, permit the blacking to flow down the acting face of the brush, and strip the surplus blacking from the brush and return it to the tank.

30. A heel blacking machine having, in combination, a tank for holding blacking, a rotary brush on a vertical axis and located on a higher level than the maximum height of the blacking in the tank, means for feeding the blacking to the brush, means for removing excess blacking from the brush, and additional means for stirring the blacking in the tank.

31. A heel blacking machine having, in combination, a tank for holding blacking, a rotary brush on a vertical axis and located on a higher level than the maximum height of the blacking in the tank, means for lift-

ing the blacking to the brush, and additional means operatively associated with the brush for stirring the blacking.

32. A heel blacking machine having, in combination, two applying brushes arranged to treat opposite sides of the heel simultaneously, means for guiding the heel, a tank for blacking, means for feeding the blacking from the tank to the two brushes, and additional means for stirring the blacking in the tank.

33. A heel blacking machine having, in combination, two applying brushes arranged to apply blacking to opposite sides of the heel simultaneously, a tank for blacking, means for feeding the blacking from the tank to the two brushes, and additional means for stirring the blacking in the tank.

34. A heel blacking machine having, in combination, a tank, a rotary brush on a vertical axis and located over the tank, means for feeding the blacking from the tank to the brush, and a stirrer depending from the brush into the blacking in the tank.

35. A heel blacking machine, having in combination, a tank for holding blacking, a rotary brush for applying blacking to the work, driven means for feeding the blacking from the tank to the brush, mechanism for driving said feeding means, means for stirring the blacking to prevent the heavy ingredients from settling, and means under the control of the workman for starting and suspending the motion of the feeding means while the stirrer continues in operation.

36. A heel blacking machine having, in combination, a stationary tank for holding blacking, a continuously operating applying brush, a continuously operating stirrer, a driven feeder, and mechanism for driving said feeder arranged to be rendered inoperative at the will of the workman.

37. A heel blacking machine having, in combination, a tank for blacking, means for applying the blacking to a heel, means for feeding the blacking from the tank to the applying means, a plurality of stirrers in the tank movable about different centers, and means for driving the stirrers.

38. A heel blacking machine having, in combination, a tank, an applying brush, a reciprocating feeder, and a rotary stirrer in the tank.

39. A heel blacking machine having, in combination, a tank, an applying brush, a feeder, a stirrer arranged to sweep the blacking toward the feeder, and actuating means for the moving parts.

40. A heel blacking machine having, in combination, a tank, an applying brush, a slow moving feeder, and a relatively rapidly moving stirrer in the tank.

41. A heel blacking machine having, in combination, a tank, a rotary brush for ap-

- plying the blacking, a feeder for carrying the blacking from the tank to the brush, and means for imparting to the feeder an irregular movement including a substantial dwell while in delivering position.
42. A heel blacking machine having, in combination, a tank, a rotary brush for applying the blacking, a feeder for carrying the blacking from the tank to the brush, and means for imparting to the feeder an irregular movement including a substantial dwell while in loading position, and stirrers arranged to sweep the blacking in the tank toward the feeder.
43. A heel blacking machine having, in combination, a tank for holding blacking, a rotary brush for applying blacking to the heel of a shoe, a feeder constructed to lift blacking from the tank and wipe it across the acting face of the brush from one edge to the other, means for operating said feeder, and means to guide a shoe with its heel in position to receive blacking from said brush.
44. A heel blacking machine having, in combination, a tank, a rotary brush for applying the blacking, a blacking lifting device having a part adapted to extend substantially across the acting face of the brush when in delivering position, and actuating means arranged to give said device a substantial pause while in delivering position to permit the blacking to be wiped off the device and distributed about the periphery of the brush.
45. A heel blacking machine having, in combination, a tank, a rotary brush for applying the blacking, a reciprocatory feeder, and means for actuating the feeder to hold it for a substantial period in delivering position to permit the rotating brush to become loaded about a large portion of its periphery.
46. A heel blacking machine having, in combination, a tank, a rotary brush for applying the blacking, a reciprocatory feeder, and means for actuating the feeder from the tank to the brush, said machine having provision for maintaining the feeder in contact with the working face of the brush for a protracted period to cause it to strip and clean said working face.
47. A heel blacking machine having, in combination, a tank, a pair of applying brushes arranged side by side to apply blacking to opposite sides of a heel, a driven feeder arranged to deliver blacking to said two brushes simultaneously and means for driving said feeder.
48. A heel blacking machine having, in combination, a tank, a pair of applying brushes arranged side by side to apply blacking to opposite sides of a heel, a driven feeder arranged to deliver blacking to said two brushes, said machine having provision for permitting a relative turning movement of the heel and the pair of brushes to effect coating of the rear end of the heel and means for driving said feeder.
49. A heel blacking machine having, in combination, a tank, a pair of applying brushes arranged side by side to apply blacking to opposite sides of a heel, and a feeder movable in and out from a position between and in delivering relation to both the brushes.
50. A heel blacking machine having, in combination, a tank, a pair of rotary applying brushes, and feeding and distributing means arranged to present an edge face to the acting face of each brush, said brushes being arranged and rotated in suitable directions for each to receive any spatter which may result from the bristles of the other brush wiping past the feeding and distributing means.
51. A heel blacking machine having, in combination, a rotary applying brush, means for supplying the brush with blacking, and independently adjustable tread guides for the heel and the sole of the shoe being blacked.
52. A heel blacking machine having, in combination, a rotary applying brush, means for supplying the brush with blacking, and guides for the heel and the sole of the shoe supported for adjustment for heels of different heights and also for heels presenting differences in pitch.
53. A heel blacking machine having, in combination, a pair of rotary applying brushes arranged to apply blacking to opposite sides of the heel of a shoe thrust between them and to permit the shoe to be turned for coating the entire edge of the heel by the brushes, means for feeding blacking to said brushes, and a heel tread rest including a head plate having a stem, a bearing in which the tread rest can turn and a screw working in said bearing to support and adjust the tread rest relatively to the plane of rotation of the brushes for heels of different heights.
54. A heel blacking machine having, in combination, a pair of rotary applying brushes arranged on vertical axes to apply blacking to the entire length of the outer edge of the heel of a shoe introduced between them and turned, means for feeding blacking to said brushes, and a laterally extended forepart tread rest for guiding the shoe as the heel is introduced and the shoe turned.
55. A heel blacking machine having, in combination, a pair of rotary applying brushes arranged on vertical axes to apply blacking to the edge of the heel of a shoe manipulated between them, means for feeding blacking to said brushes, a heel tread rest, and a forepart tread rest, said machine

having provision for adjustment of the forepart tread rest relatively to the other rest and the brushes for heels of different pitches.

56. A heel blacking machine having, in combination, a tank, a rotary brush located over the tank on a vertical axis in a bearing rising from the tank, and a plate below the brush having a circumferential rib to prevent the blacking from running from the brush into the bearing.

57. A heel blacking machine having, in combination, two rotary brushes arranged on vertical axes to permit a heel to be introduced between them and turned to apply blacking to its opposite sides and rear end, means for feeding blacking to the brushes, and a rest formed and arranged to guide the forepart of the shoe in said turning movement of the shoe.

58. A heel blacking machine having, in combination, two rotary brushes arranged on vertical axes to permit a heel to be manipulated between them for applying blacking to its opposite sides and rear end, means for feeding blacking to the brushes, a tread rest for the heel, and a stationary, laterally extended rest formed and arranged to guide the forepart of the shoe in the said turning movement of the shoe.

59. A heel blacking machine having, in combination, two rotary brushes arranged on vertical axes to permit a heel to be manipulated between them for applying blacking to its opposite sides and rear end, means for feeding blacking to the brushes, a rest upon which the heel can be turned, and an adjustable segmental plate arranged to support and guide the forepart of the shoe during said turning movement.

60. A heel blacking machine having, in combination, with means for feeding blacking, a pair of rotary brushes arranged side by side to permit a heel to be manipulated between them to apply blacking to its opposite sides and its rear end, and adjustable means to determine the vertical and angular relation of the heel to the brushes for the purposes described.

61. A heel blacking machine having, in combination, a tank, two rotary brushes for coating opposite sides of a heel, and a lifting device for the blacking having a portion formed and arranged to pass, when said device is raised, between the brushes and extend across the space which separates them with its edges in contact with the bristles of the two brushes.

62. A heel blacking machine having, in combination, a tank, two rotary brushes for coating opposite sides of a heel, and a lifting device comprising a portion to dip into the blacking and then engage the brushes, a pivotal support for the opposite end of said device, a cam, and a lifting pin resting on

the cam and engaging said device, said cam being formed to give said device a substantial dwell at the ends of its movement.

63. A heel blacking machine having, in combination, a brush, means for supplying the brush with blacking, a stripper to distribute the blacking over the working face of the brush, and means for automatically moving the stripper from and toward the brush.

64. A heel blacking machine having, in combination, a brush, means for supplying the brush with blacking, a stripper and means for automatically moving the stripper intermittently into and out of operative relation to the brush.

65. A heel blacking machine having, in combination, a brush, a receptacle arranged to contain blacking, a stripping and feeding device and automatic means for moving the stripping and feeding device alternately from brush stripping and feeding position into the receptacle.

66. A heel blacking machine having, in combination, a brush, means for supplying the brush with blacking, including a tank, a stirrer to keep the blacking in motion in the tank, a feeder, and a stripper movable automatically from stripping position into the moving blacking in the tank to have surplus blacking dislodged from it by the moving blacking in the tank.

67. A heel blacking machine, having, in combination, a rotary brush arranged on a vertical axis, means for supplying said brush with blacking, and a stripper movable automatically to and from an operative position to distribute the blacking and remove excess from the brush.

68. A heel blacking machine, having, in combination, a rotary brush, means operating intermittently to deliver blacking to the brush, and a stripper moved in time relation therewith to distribute the blacking on the rotary brush.

69. A heel blacking machine having, in combination, a brush, a tank for blacking, a feeding and distributing device comprising the paddle 21, the stripper 22, and means for lifting the said device from the tank to the brush.

70. A heel blacking machine having, in combination, two rotary yielding faced brushes arranged on vertical axes to apply blacking to the opposite sides and rear end of a heel manipulated between them, and devices for limiting the approach of the heel toward the axis of each yielding faced brush.

71. A heel blacking machine having, in combination, two rotary yielding faced brushes arranged on vertical axes to apply blacking to the opposite sides and rear end of a heel manipulated between them, devices for limiting the approach of the heel to

ward the axis of each yielding faced brush, and a heel tread rest cooperating with said limiting devices to determine the relation of the heel to the yielding faced brushes.

5 72. A heel blacking machine having, in combination, two rotary yielding faced brushes arranged on vertical axes to coat the opposite sides and rear end of a heel manipulated between them, and devices for
10 limiting the approach of the heel toward the axis of each yielding faced brush, said devices being constructed and arranged to perform their position-limiting function while the heel is manipulated into different rela-
15 tions to the brushes to effect the coating of the entire heel edge with blacking.

73. A heel blacking machine having, in combination, a brush for applying blacking to the edge of a heel, means for supplying
20 the brush with blacking, a rest for the tread face of the shoe sole, a rest for the tread face of the heel, and means whereby a relative adjustment of said rests may be effected to guide the heel in different angular relations
25 as it is presented to the brush.

74. A heel blacking machine having, in combination, two rotary brushes arranged side by side and spaced apart to permit the
30 partial introduction of a heel between them, and means for supporting the shoe having provision for adjustment to present the shoe in different angular relations to the plane of the brushes.

75. A heel blacking machine having, in
35 combination, two rotary brushes arranged side by side and spaced apart to permit the partial introduction of a heel between them to coat the sides of the heel and to allow the shoe to be turned in contact with one of
40 the brushes to coat the rear end of the heel as it is withdrawn, and shoe supporting means arranged for adjustment to guide the shoe in a position inclined to the plane of the brushes so that as the shoe is turned
45 and moved lengthwise a greater or less height of heel edge will be coated by the brushes.

76. A heel blacking machine having, in combination, two rotary brushes arranged side by side and spaced apart to permit the
50 partial introduction of a heel between them to coat the sides of the heel and to allow the shoe to be turned in contact with one of the brushes to coat the rear end of the heel, and
55 positioning means for the tread of the heel and positioning means for the forepart of the shoe, said two means being relatively adjustable to incline the shoe to the plane in which the brushes rotate.

77. A heel blacking machine having, in
60 combination with suitable means for supplying blacking, two brushes arranged to permit the shoe to be turned, while the heel is in engagement therewith, toward each brush to apply blacking to the rear end of
65 the heel and to both sides of the heel adjacent to the breast, and guiding devices arranged to determine the position of the shoe relatively to the brushes in the direction of the height and the length of the heel.
70

78. A heel blacking machine, having, in combination with means for applying black-
ing to heels, a tank to contain the blacking, a stirrer, means to actuate the stirrer, and
75 a feeder arranged to be introduced intermittently into the blacking and thereby to break up or change the currents produced by the stirrer.

79. A heel blacking machine having, in combination with means for applying black-
80 ing to heels, a tank to contain the blacking, means whereby the blacking is delivered to the applying means, a stirrer, and means for actuating the stirrer, said machine having provision for intermittently breaking up or
85 changing the currents produced in the blacking by the action of the stirrer.

In testimony whereof, I have hereunto subscribed my name this 27th day of August 1907.

GEORGE L. ROLLINS.

Witnesses:

JOSEPH BECKER,

CHARLES D. WOODBERRY.