

F. M. FURBER.  
HEEL BLACKING MACHINE.  
APPLICATION FILED AUG. 7, 1908.

1,007,777.

Patented Nov. 7, 1911.  
5 SHEETS—SHEET 1..

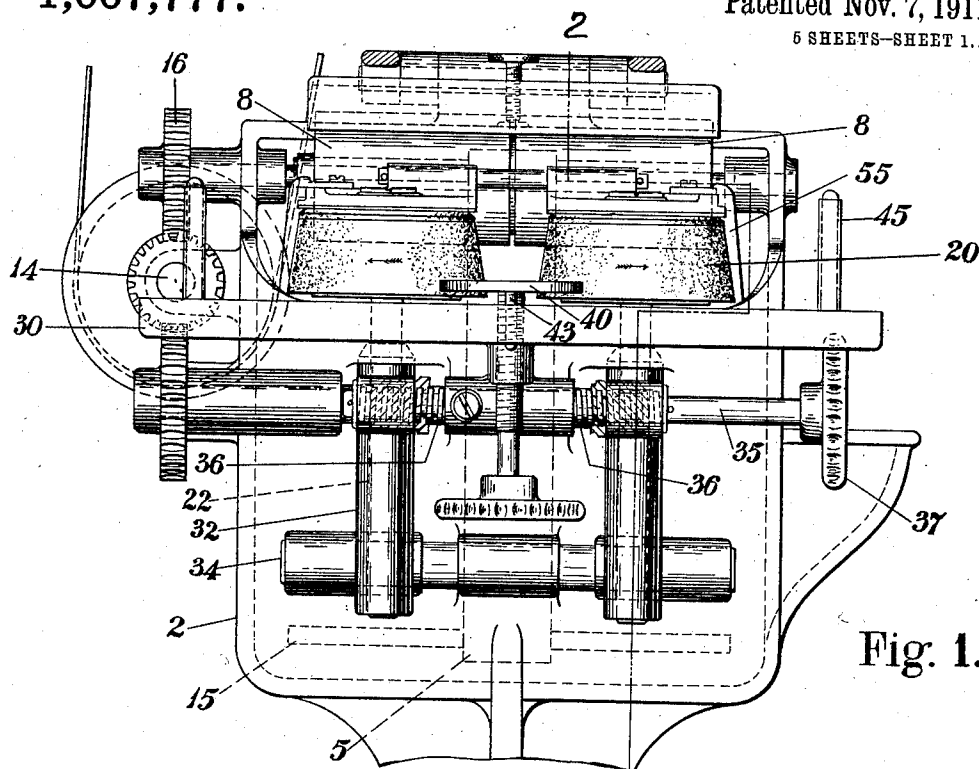


Fig. 1.

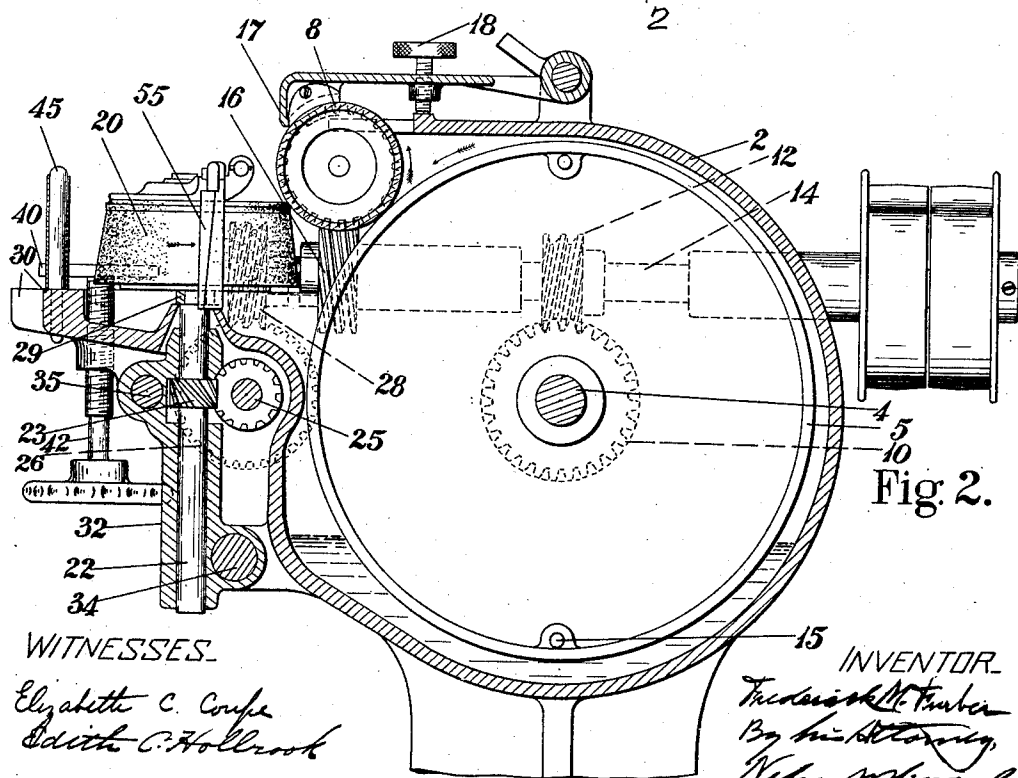


Fig. 2.

WITNESSES.

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6 SHEETS—SHEET 2.

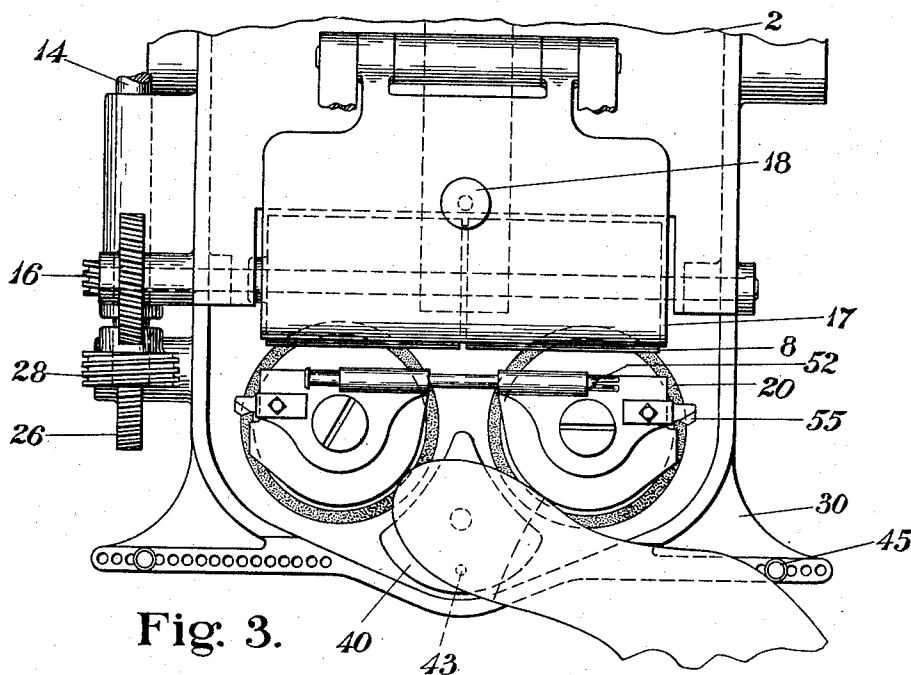


Fig. 3.

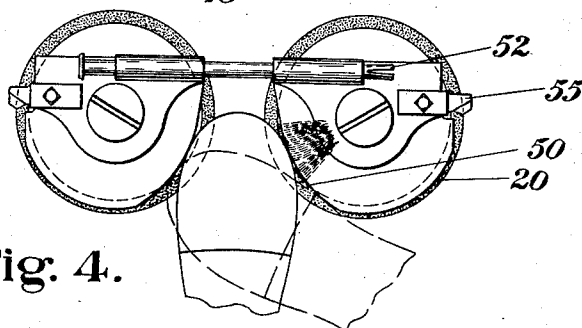


Fig. 4.

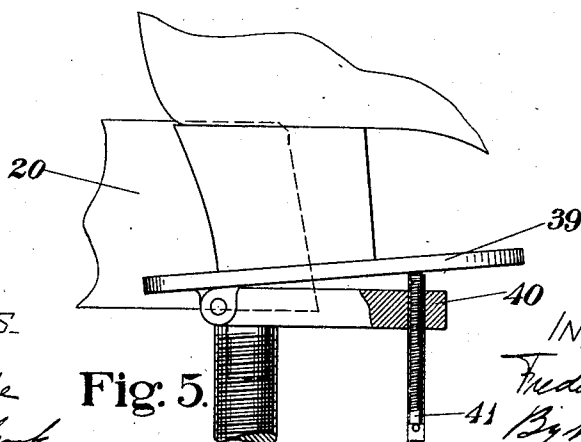


Fig. 5.

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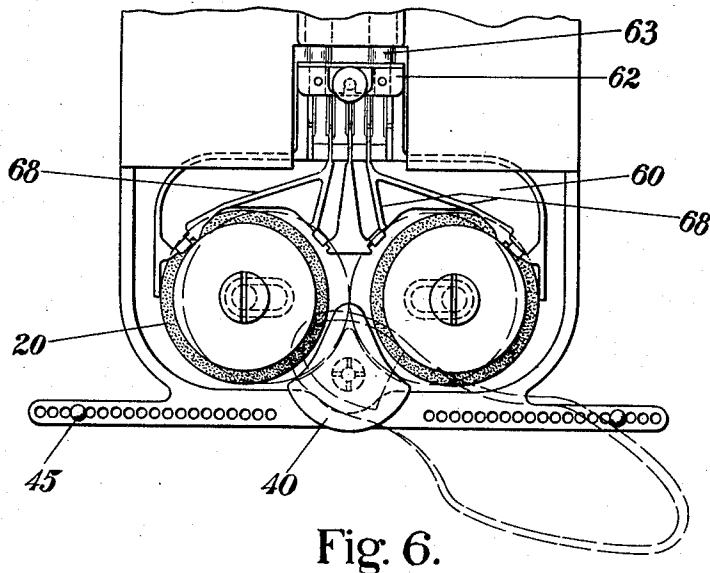


Fig. 6.

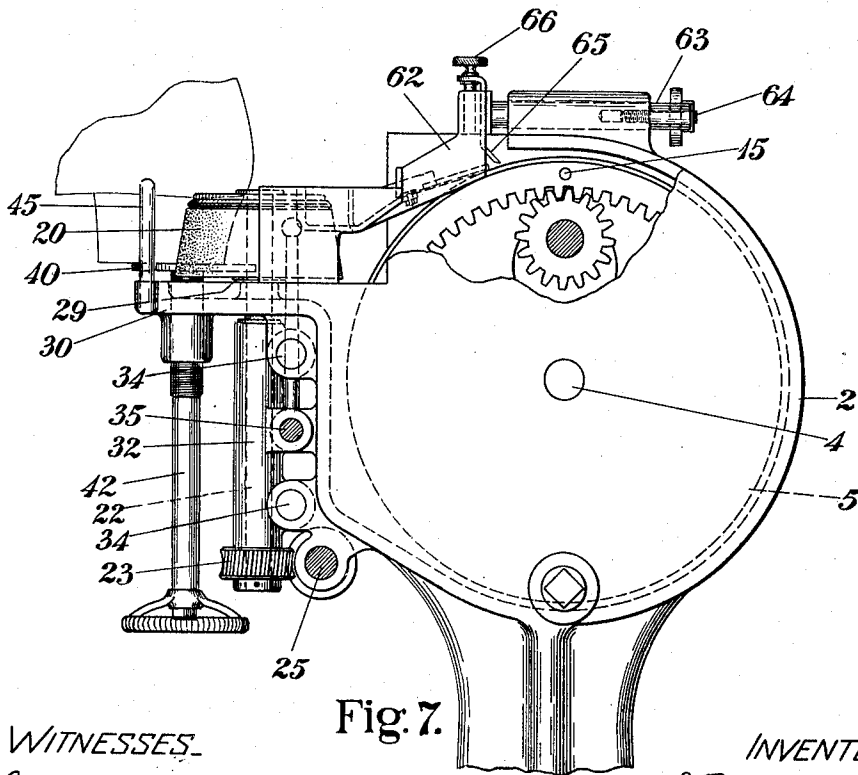


Fig. 7.

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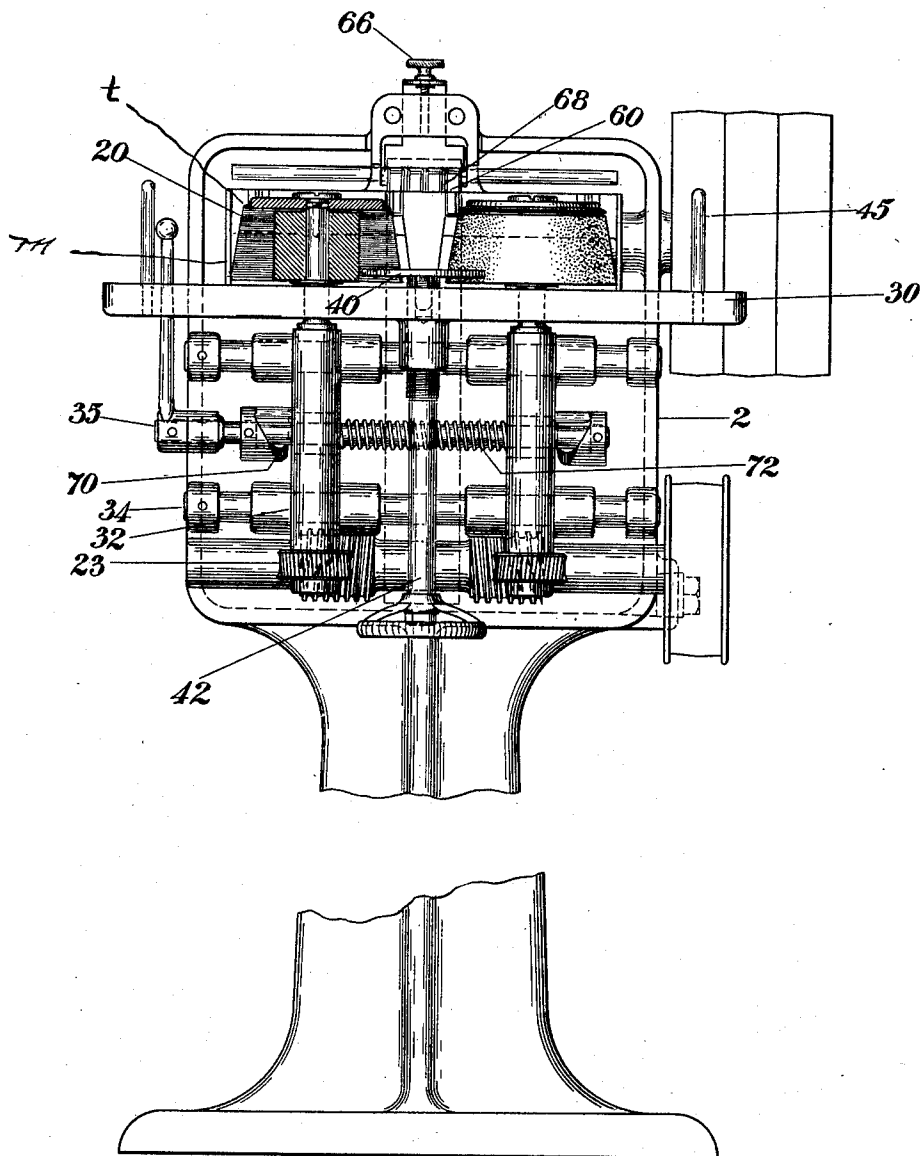
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5 SHEETS—SHEET 4.



WITNESSES.

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Fig. 8.

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6 SHEETS—SHEET 5.

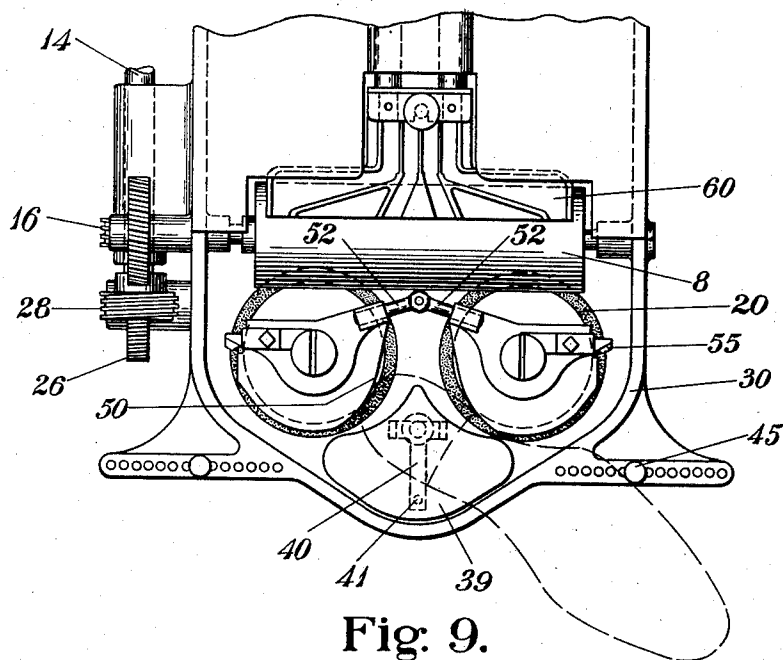


Fig. 9.

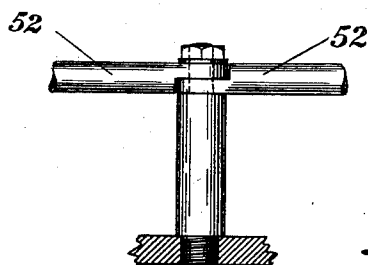


Fig. 10.

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# UNITED STATES PATENT OFFICE.

FREDERICK M. FURBER, OF REVERE, MASSACHUSETTS, ASSIGNOR TO UNITED SHOE MACHINERY COMPANY, OF PATERSON, NEW JERSEY, A CORPORATION OF NEW JERSEY.

## HEEL-BLACKING MACHINE.

1,007,777.

Specification of Letters Patent.

Patented Nov. 7, 1911.

Application filed August 7, 1908. Serial No. 447,399.

*To all whom it may concern:*

Be it known that I, FREDERICK M. FURBER, a citizen of the United States, residing at Revere, in the county of Essex and Commonwealth of Massachusetts, have invented certain Improvements in Heel-Blackening 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 use in finishing boots and shoes and other articles and particularly to machines for applying blacking or finishing material, herein referred to generically as "blacking," to the edges of heels or soles.

For convenience reference will be made herein to the work as the "heel" with the understanding that, except as obviously required by the context, the term is used in a broad sense to designate the heel, sole, or other part of the shoe being worked upon.

An object of the invention is to provide a machine by which the heel of a shoe can be blacked at the same speed as by hand or faster, with less liability of soiling other parts of the shoe than the faces which it is intended to treat, and with greater assurance of thoroughly coating every portion of the surface that requires blacking.

An important feature of this invention consists in a machine for blacking heels having provision for applying to the edge face of a heel enough blacking to coat it and for applying to the rand crease—that is, the crease between the upper and the sole or welt—a relatively greater quantity of blacking to insure the thorough coloring of all the surfaces in the crease and which will preferably be enough to flood the crease. By flooding the crease the blacking finds its way into the bottom of the crease and into the irregularities of the crease more surely and with less attention from the operator than when a brush or portion of a brush is employed which is supplied with a suitable quantity of blacking for coating the edge of the heel. This relatively abundant applica-

tion of blacking to the crease may be obtained by supplying to the crease or to the portion of the applying device acting at the crease a relatively greater quantity of blacking than to the edge of the heel or to like portions of the device for spreading the blacking on the edge face of the heel.

In the embodiment of the invention herein shown the blacking is applied to the heel by brushes, to the crease-blackening portions of which a greater quantity of material is supplied than to the edge-blackening portions. This may be accomplished as here shown by arranging the brushes on vertical axes and supplying the blacking to the upper edge portion which enters the rand crease, while permitting the portion of blacking not used in the crease to work down by gravity to the lower edge-coating portion of the brush.

In the heel-blackening operation it is important to avoid smearing or daubing portions of the shoe which do not require to be blacked. I have discovered that by applying the blacking to the rand crease as above suggested the walls of the crease can be thoroughly blacked without getting much blacking on the upper at the side of the shoe. There is, however, a tendency for the bristles at the edge of the brush to spread out or bend upwardly against the upper and after a period of use these bristles assume an upwardly bent position in which they daub blacking upon the upper.

A feature of this invention consists in providing means for automatically bending back the bristles at the edge of the brush. This has the double advantage that the brush is kept in better shape so that it wears longer and that neater work is done. The bending back of the bristles may be effected by a device with relation to which the brush travels in its rotary movement. As herein shown a plate arranged at the end face of the brush has an acting face which extends from a point within the periphery of the brush outwardly in a tangential line or in a direction oblique to the radius of the brush and wipes the bristles downwardly and outwardly as they pass under it. This

wiper has also a tendency to strip the blacking toward the ends of the bristles, keeping them clean and free from thickened or dried blacking which would otherwise accumulate at the edge of the brush.

In accordance with a further feature of the invention means is provided which is adapted to bend the bristles at the upper end of the brush, which are intended for applying blacking in the rand crease, downwardly into a position inclined toward the body of the brush. By this means the ends of the bristles are shaped to enter between the inclined upper and lower faces of the rand crease and force the blacking deeply into the crease. The means herein shown for thus shaping the brush to enter the crease is the roll which transfers the blacking from the source of supply to the brush. This roll turns in contact with the crease-blackening bristles, wiping them downwardly and depositing upon them a quantity of blacking which they carry into the crease. The blacking is supplied in sufficient quantities to flood the crease, being driven into the bottom of the crease by the shaped edge of the brush and the excess flowing down the face of the brush and the edge face of the heel over which it is wiped by the brush. Preferably and as herein shown, the end face of the brush is beveled, not only by the forming or shaping means described but in its initial formation to shape it for entering the rand crease. This initial formation may be given to the brush by the direction in which the bristles are projected from the hub, but preferably it is obtained by cutting the bristles on a bevel, the upper bristles being made the shorter. The bristles forming the crease-blackening portion of the brush may advantageously be much stiffer than the bristles that act on the edge of the heel. This enables them more certainly to force or drive the blacking into the crease. They are preferably formed upon a thin section of the brush, the body portion of which consists of soft bristles adapted to wipe the blacking over the edge face of the heel and leave a smooth coating thereon.

In blacking the heel at and adjacent to the edge of the breast care must be exercised to avoid running past the edge and depositing blacking on the breast face of the heel and upon the shank, which in many shops is not to be blacked. To assist the operator in presenting or turning the shoe with relation to the brushes to bring the side of the heel into position to be blacked without soiling the breast and shank I have provided, in accordance with another feature of this invention, adjustable stops against which the turning movement of the shoe in both directions may be limited. These stops are adjustable for shoes of different

sizes and reduce materially the care required of the operator in presenting the shoes so that he is able to work more rapidly. One of the difficulties encountered in blacking heels is that the bristles spring or snap forwardly as they pass the edge of the breast and spatter blacking upon the shank and sole.

Another important feature of this invention consists in provision for overcoming this difficulty and is herein shown as embodied in means for guiding the shoe with relation to the brush so that the bristles will not be flexed or bent backwardly enough when they reach the breast edge to cause them to spring or snap past the edge to an extent to spatter blacking. The shoe-guiding means may advantageously be formed to permit the shoe to be pressed more closely against the brush when the portions distant from the breast edge are being treated so that the bristles will wipe over it in the usual way for spreading coating material, but as the shoe is turned to present the portion adjacent to and at the breast edge it is forced or guided outwardly from the center of the brush so that the backwardly bent bristles have opportunity to recover themselves or resume substantially their normal straight position before they pass the breast edge. In this position they do not spring forward as they pass the edge and do not spatter blacking. The shoe-guiding means for this purpose may advantageously be the same plate or device by which the upturned bristles are straightened as has been before described. This device as herein shown comprises a stationary plate having an acting edge eccentric to the rotary brush and located with relation to the periphery of the brush to form a stop which permits the shoe to be pressed somewhat deeply into the brush when the body portion is being coated and to guide the shoe outwardly from the brush as the breast edge is approached so that the bristles may partially or completely recover their normal position when the edge is reached. Provision is made for adjustment of this guide and when, as here illustrated, a plurality of brushes are employed between which the heel is thrust for treating it at two or more points simultaneously the guides on opposed brushes may limit the extent to which the heel is thrust into the machine. By thus limiting the extent to which the heel enters the machine and also limiting, by the adjustable stops, the extent to which the shoe is turned the operator may present the shoe without the exercise of that care and skill which would otherwise be required for he can merely thrust the heel backwardly upon the suitably adjusted tread rest until it is stopped by the guides and then swing or turn the toe end first to one

side to the stop to black the heel to one breast edge and then swing it in the other direction until it engages the opposite stop for blacking the other side of the heel to the other breast edge. The guiding plates cause the shoe to be automatically moved outwardly from the brush center as the shoe is turned to move the breast edge toward the contact point with the brush. Still another feature of construction is employed for this purpose of preventing spattering and this consists in setting the bristles very close together and interlacing them more or less on the body portion of the brush, leaving no spaces between them as occurs when separate bunches or tufts of bristles are set at intervals in the hub so that the periphery of the brush is made up of distinct groups of bristles which are free to spring forwardly without encountering the adjacent group as they pass the breast edge of the heel. No danger arises of spattering blacking by the portion of the brush that acts in the rand crease and the relatively short and stiffer bristles of this portion of the brush may advantageously be set less close together so that they will carry a greater quantity of blacking into the rand crease. Provision is made, in an angularly adjustable heel tread rest, for supporting the shoe with the rand crease in parallel relation to the crease-blackening section of the brush.

In the preferred embodiment of the invention the blacking, which is taken from the reservoir by a drum having stirrers that keep the blacking constantly agitated, is delivered to the brushes by a rotary transferer which turns in substantial contact with the drum at its front side and in the same direction as the drum and wipes downwardly across the upper end and edge of the brushes. This delivering mechanism, which has the advantage of keeping the blacking in constant motion on moving parts of the mechanism so that it has no opportunity to settle or thicken and thereby impede its delivery, is an important feature of this invention.

A further feature of this invention embodied in a modified construction consists in means for insuring the delivery of predetermined relative quantities of blacking to each of the brushes and to each brush when adjusted into different positions for treating large and small shoes. This feature of the invention is shown as embodied in a distributor which may be substituted for the rotary transferer or be used with said transferer. The distributor is herein shown as comprising a plate having its narrow rear end arranged in scraping contact with the drum in the reservoir. The front portion of the plate is provided with partitions or walls to divide the blacking as it

comes from the drum and direct predetermined portions thereof toward each of the brushes. The forward portions of the distributor overlie the top faces of the brushes to deliver the blacking upon the crease section of the brush. The distributor is shown as having two channels for each brush. From one pair of channels the blacking is delivered upon the brushes when they are adjusted for large heels, as those of men's shoes, and from the other pair of channels the blacking is delivered upon the brushes when they are adjusted closer together for small or women's shoe heels. This channeled or partitioned distributor has the advantage that it insures to each brush its proper proportion of blacking whether or not the machine is set up level.

These and other features of this invention, including certain details of construction and combinations of parts, will appear in connection with the following description of the machine in which I have embodied the invention for the purpose of explanation and will then be pointed out in the claims.

Figure 1 is a front elevation of the machine; Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a plan. Fig. 4 is also a plan showing the action of the guides. Fig. 5 is a detail of the shoe rest. Figs. 6, 7, 8, 9 and 10 show modifications.

The machine comprises a reservoir 2 which is cylindrical in its general shape and has bearings for a shaft 4 carrying a drum 5 the periphery of which serves to lift blacking from the lower part of the reservoir to a transferer 8. The shaft has a pinion 10 driven from a worm 12 on a shaft 14 supported in bearings at the side of the machine and having fast and loose pulleys. Normally the belt will be retained on the fast pulley and the drum be constantly driven. The drum has laterally projecting arms 15 reaching nearly to the ends of the reservoir which sweep through the blacking near the bottom of the reservoir and keep it constantly stirred.

The transferer 8 is in the form of a roll driven, as indicated by the arrow thereon in Fig. 2, in the same direction as the drum 5 and is located substantially in contact with the drum so that the blacking is caused to collect or pile up in the angle between the peripheries of the two rolls. The transferer is driven from a worm 16 on the shaft 4, the inclination of this worm being opposed to that of the worm 12. A scraper 17, which limits the amount of blacking carried by the transferer and catches any lumps that there may be, is positioned on the reservoir, as shown in Fig. 2, and can be adjusted by a screw 18. The transferer wipes down across the upper edge of the applying rolls 20, delivering its blacking upon

the top thereof. These rolls are arranged in position to act simultaneously upon opposite sides of a heel thrust between them which can be turned to present the entire edge face to the action of the rolls. The rolls comprise brushes, which are shown as tapered to conform to a usual shape of heel, and fast to vertical shafts 22 having worms 23 that engage opposite threaded portions of a shaft 25 which is driven by a pinion 26 from a worm 28 on the shaft 14. Each roll shaft 22 has a collar 29 by which it is supported on the slotted forward extension or shelf 30 of the reservoir 2, as shown in Fig. 2. Each of the two shafts 22 has a bearing in a block 32 which is guided in upright position on a horizontal slide rod 34 and a rod 35 which has oppositely inclined threads at 36 where it passes through the blocks and has a hand wheel 37 by which it can be turned to adjust the brush shafts from and toward each other for large or small shoes. The slots in the shelf 30 permit this adjustment of the brush shafts 22. A table or heel tread rest 40, in the form of a three-edged plate having its faces adjacent to the brushes concaved to conform approximately to the peripheries of the brushes, has a depending stem that fits into the tubular upper end of an adjusting screw 42 having a hand wheel on its lower end, as indicated in Fig. 2. The rest may also have a depending pin 43 to fit into a hole in the shelf 30 to prevent it from turning. Stop pins 45, which may be covered with rubber, are arranged at opposite sides of the machine for limiting the extent to which a shoe is turned for presenting the entire side face up to but not beyond the breast edge. The shelf 30 has a series of holes in which the stop pins may be positioned according to the size of the heels being treated and will assist the operator in terminating the swinging movement of the shoe before a point is reached at which the brushes would apply or spatter blacking upon the shank or breast of the shoe. The rest will be adjusted vertically for heels of different heights and will support the shoe in such relation to the brush that the upper edge portion of the brushes will enter and black the rand crease between the upper and the top face of the heel seat end of the sole. Preferably the brushes will comprise a main section *m* which may be of usual formation with long flexible bristles which will preferably be set as close together as practicable to brace one another and prevent them from snapping and spattering blacking as they pass the breast edge of the heel. These bristles may be mounted in a wooden hub of usual construction. In addition the brush comprises a thin section *t* adapted to act in the crease of the shoe. This crease section will preferably include

a wide metal hub or disk and short stiff bristles on its periphery adapted to resist the bending influence of the work upon them and to reach into and thoroughly coat the surfaces of the rand crease. The acting edge of this section may be beveled as shown to adapt it to the shape of the crease. The shorter bristles are at the upper edge and assist in preventing the relatively longer lower bristles from bending upwardly as they have a tendency to do after being used a little while. The bristles will preferably be set less closely than in the main section of the brush to adapt them to carry more blacking into the crease.

The edge of the metal disks above the short bristles may, if desired, be arranged to engage the upper of the shoe to guide the shoe with relation to the brushes. Additional guides 50 are arranged upon the top faces of the brushes and connected by the bar 52 which prevents them from turning, but permits them to slide toward and from one another, maintaining their proper relation to the brushes when the latter are adjusted. These guides have acting edge faces for engaging the shoe which are formed eccentric to the brushes, as shown in plan view in Fig. 4. These eccentric edges uncover a maximum width of the bristles at the inner or adjacent portions of the two brushes and permit it a decreasing extent of projection as the outer portion of the brush is approached or that portion which will act upon the shoe at and adjacent to the breast edge. This formation of the guides that determines the relation of the work to the bristles insures that the bristles shall be bent back by the work less as they approach the heel breast edge. This reduces the tendency of the bristles to spatter or throw blacking as they snap past the edge of the breast. The eccentric formation of the guide also causes it to bend back automatically toward their horizontal position the bristles at the upper edge of the brush that have been bent upwardly by their engagement with the work. This keeps the brush in proper shape and also it prevents the daubing of the shoe upper which would be done by the bent-up bristles. The tread rest may be provided, as shown in Fig. 5, with a superposed angularly adjustable shoe supporting plate 39 pivoted to the rest 40 and adjustable by a screw 41 to support pitched heels with the rand crease parallel to the crease-blackening section of the brush. The screw 41 will take the place of the pin 43 that is shown in Fig. 1.

In the use of the machine a shoe is presented with the tread face of the heel on the rest 40 and pushed back between the brushes, which with the guides 50 carried by them are relatively adjusted to permit the heel to

be thrust into position for both sides to be treated at the same time. The guides 50 stop or may limit the backward movement of the heel. The shoe is then turned toward one side and then toward the other to swing the entire edge surface of the heel into contact with the brushes to be coated with blacking by them. The stops 45 limit the turning movement so that the blacking is not smeared upon the shank of the shoe or upon the breast face. As the shoe is turned in contact with one guide or the other along its side toward the breast edge said guide, by its eccentric formation, forces the heel farther away from the axis of the brush so that the bristles are permitted to unbend or partially unbend before they pass the breast edge. The bristles which may be upbent by the work are automatically straightened by the eccentric guides 50 with each rotation of the brushes. These bristles are also further straightened by the engagement of the transferring roll 8 with them. This roll wipes down from the top of the brush and turns the bristles down even below their normal position. It will be observed that the transferer applies the blacking upon the top or top edge of the brush from which position it flows down by gravity to the lower portions. This gives a maximum of blacking for those bristles which are to apply it in the rand crease. By the arrangement shown, by which the blacking is applied in large quantities upon this upper portion of the brush, the bristles entering the crease flood blacking into the crease so that it finds its way into all the cracks and depressions. The rubbing engagement of the transferer with the bristles at the edge of the brush keeps these bristles clean and prevents blacking from drying and caking at this part of the brush as it would otherwise do. The machine will preferably be maintained in motion constantly so that the brushes are loaded with blacking ready for coating a heel at any time. Scrapers 55 remove surplus blacking from the brushes and return it to an inclined portion of the shelf 30 from which it flows back into the reservoir. These scrapers may be adjustably attached to the shoe-guiding plates, as shown in Figs. 3 and 4, by binding screws, and will be maintained with said plates in constant relation to the brushes in the relative adjustment of the brushes. The arms 15 keep the blacking in the entire reservoir constantly stirred and prevent the wax, which is in suspension in the blacking solution, from settling as it has a tendency to do quite rapidly.

In the modified construction shown in Figs. 6, 7, and 8 a distributor in the form of a plate 60 having its upper end in substantial contact with the drum 5 and its lower

end overlying the brushes 20 is substituted for the transfer roll 8. The distributor is supported by a block 62 having arms 63 sliding in a boss on the reservoir and a screw 64 connecting it with the boss for adjustment of the distributor horizontally whereby its relation to the drum and the quantity of blacking which it will take from the drum can be varied. A scraper 65 adjustable by a screw 66 also is provided to vary the amount of blacking which the drum will carry to the distributor and to prevent any lumps from reaching the distributor. The distributor is provided with partitions or dividing walls 68 arranged to divide the blacking as it comes from the drum and insure that a suitable proportion shall be directed to each brush even if the machine is not set up level. The partitions also prevent the blacking thickening on the distributor in a way to form irregular channels as might occur if a plane surfaced distributor were employed. The partitions are shown as arranged to provide two runs for each brush. From the inner ones blacking will be directed upon the brushes when the latter are adjusted for small heels and from the outer ones the blacking will fall upon the brushes when they are positioned for large heels of men's shoes. The shaft 35 is provided in this modification with cams (shown in Fig. 8) instead of the screw threads 36 of Fig. 1 cooperating with the brush carrying blocks 32 to adjust the brushes and a spring 72 holds the blocks 32 against the cams. In this construction the drum is driven from an internal gear and a pinion, as shown in Fig. 7. The transferring roll 8 and the distributor 60 are more than substitutes the one for the other for each has a distinctive function in addition to their common function of carrying the blacking and in Fig. 9 I have shown an arrangement in which the roll and the partitioned distributor are combined to secure the distinctive function of each while they cooperate in delivering the blacking. The partitioned distributor insures the delivery of predetermined proportional quantities of blacking to the portions of the transferer which cooperate with the different brushes in their adjusted positions and the roll carries these portions of blacking directly to the brushes. The roll also serves its characteristic purpose of shaping the edge of the brush and wiping or stripping the bristles that work in the rand crease.

I have illustrated in Figs. 9 and 10 a modified construction of the sliding rod 52 (Fig. 4) which connects and holds the guides 50 from rotating. In the modification two rods 52 have their adjacent ends pivoted on a vertical post (Fig. 10) and their other ends slide in lugs on the guides

50, thus enabling the brushes to be adjusted toward or from each other. By this construction a relative adjustment between the guides 50 and their respective brushes can be effected, since as the brushes are moved toward or from each other, the rods 52 will cause the guides 50 to turn on their respective brushes, thus adjusting the guides into the proper positions for guiding a different size or style of heel.

In the following claims reference is made to positions of parts and to directions of movement of elements which are to be understood as terms of designation and not of limitation, as it is obvious that the relative positions and the relative directions of movement are important rather than absolute and positive directions.

Having explained the nature of this invention and described a preferred construction embodying the same, I claim as new and desire to secure by Letters Patent of the United States:

1. A machine of the class described having, in combination, means for blacking a heel having provision for applying a relatively greater amount of blacking material to the rand crease than to the edge of the heel.

2. A machine of the class described having, in combination, means for blacking a heel having provision for flooding the rand crease and for coating the heel edge with a relatively smaller deposit of blacking material.

3. A machine of the class described having, in combination, means for blacking the rand crease of a shoe and means for blacking the edge of the heel, and means for supplying a relatively greater quantity of coloring matter to the crease-blackening means than to the edge-blackening means.

4. A machine of the class described having, in combination, means for blacking the rand crease of a shoe and means for blacking the edge of the heel, and means for supplying coloring material directly to the crease-blackening means and indirectly to the edge-blackening means.

5. A shoe blacking machine having, in combination, means for supplying blacking, and means for distributing the blacking constructed and arranged to apply to the rand crease of the shoe a relatively greater quantity of blacking than to the edge face of the heel or sole.

6. A shoe blacking machine having, in combination, means for supplying blacking, and means for distributing the blacking constructed and arranged to flood the rand crease while coating the edge of the heel or sole.

7. A shoe blacking machine having, in combination, means for supplying blacking,

and a horizontally arranged brush constructed and arranged to treat with its upper edge the crease faces of the shoe and with its body portion the edge faces of the heel or sole and located with relation to the supplying means to receive the blacking directly upon its upper edge.

8. A shoe blacking machine having, in combination, means for supplying blacking, a brush arranged for movement in a horizontal plane and to receive the blacking upon its upper edge, and means to assist the operator in presenting the work with the rand crease in position to receive blacking from the upper edge portion of the brush.

9. A shoe blacking machine having, in combination, horizontally arranged applying devices for distributing the blacking at the same time at opposite sides of the shoe horizontally presented thereto, and supplying means arranged to discharge blacking upon the upper edges of said devices.

10. A shoe blacking machine having, in combination, horizontally arranged brushes adapted to treat a shoe thrust between them, means for delivering blacking upon the upper edge portions of the brushes, and means for guiding the shoe to receive blacking in its rand crease from said upper edge portions of the brushes and to have the edge faces of the heel coated by the body portions of the brushes.

11. A shoe blacking machine having, in combination, horizontally arranged brushes adapted to treat a shoe thrust between them, means for delivering blacking upon the upper edge portions of the brushes only, and shoe-guiding means adjustable from and toward said upper edge portion of the brushes to present the rand creases of heels of different heights in position to be treated by that portion of the brushes.

12. A shoe blacking machine having, in combination, a brush for applying blacking to the heel edge, and a roll on an axis at right angles to said brush and arranged to deliver blacking to one edge of the brush.

13. A shoe blacking machine having, in combination, horizontally arranged brushes adapted to treat a shoe thrust between them, and means for delivering blacking upon the upper edge portions of the brushes, comprising a roll arranged at right angles to the brushes and wiping across the edge of the brushes.

14. A heel blacking machine having, in combination, a blacking brush constructed to apply blacking to the edge of a shoe bottom, a blacking supplying device movable on an axis at right angles to the axis of the brush, and means for operating said device to cause it to wipe blacking on to the brush across the edge of the brush.

15. A heel blacking machine having, in

combination, a blacking brush, means to actuate the brush, and means to straighten the bristles of the brush as it is actuated.

16. A heel blacking machine having, in combination, a blacking brush, means for rotating the brush, and a device under which the end of the brush turns in wiping contact to bend downwardly bristles which may have been upturned by the work.

17. A heel blacking machine having, in combination, a blacking brush, means for rotating the brush, and bristle-straightening means having an acting edge extending obliquely across the edge of the brush.

18. A heel blacking machine having, in combination, a blacking brush, means for rotating the brush, and a plate in contact with the end face of the brush and having a bristle-straightening edge eccentric to the axis of the brush and extending across its edge.

19. A heel blacking machine having, in combination, a blacking brush, and shaping means for bending the end bristles into a position inclined downwardly toward the body of the brush for the purpose described.

20. A heel blacking machine having, in combination, a blacking brush including a portion for forcing blacking into the rand crease, and means for engaging the bristles that act along the shoe upper side of the crease to direct them downwardly.

21. A heel blacking machine having, in combination, a blacking brush including a portion for forcing blacking into the rand crease, and shaping means coöperating with the crease-blackening portion of the brush.

22. A heel blacking machine having, in combination, a blacking brush, means for rotating the brush, and a shaping roll turning across the end of the brush.

23. A heel blacking machine having, in combination, a heel-blackening brush comprising a thin section having short stiff bristles and tapered from its upper edge downwardly for forcing the blacking into the rand crease, and a thick section of soft bristles for wiping blacking upon the edge of the heel, and means for actuating the brush.

24. A heel blacking machine having, in combination, two rotatable brushes between which the heel may be thrust and turned from side to side to coat the different portions of the heel edge, a tread rest for positioning the shoe with relation to the brushes, and an adjustable stop arranged near each brush to engage the fore part of the shoe to limit its turning movement before the breast edge of the heel reaches position to receive blacking from the brushes.

25. A heel blacking machine having, in combination, devices for applying blacking, a tread rest 40, a shelf 30, and stops 45 located at either side of the tread rest and adjustable in holes formed in the shelf 30, said

stops serving to limit the movement of the shoe with relation to said devices.

26. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, and shoe-guiding means arranged to position automatically different portions of the shoe in different radial relations to the periphery of the brush for the purpose described.

27. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, and shoe-guiding means with relation to which the shoe is moved, said guiding means being shaped to guide the shoe away from the brush as the breast edge of the heel approaches the acting portion of the brush for the purpose described.

28. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, and a guide plate having an acting edge eccentric to the periphery of the brush and formed to force the shoe outwardly as the breast edge of the heel approaches the acting portion of the brush for the purpose described.

29. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, and shoe-stopping and guiding means arranged to require the shoe to be turned along the brush and the guiding means, said guiding means being constructed and arranged to force the shoe outwardly as the breast edge of the heel approaches position to receive blacking.

30. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, a plate arranged adjacent to one end of the brush and provided with a shoe-guiding face oblique with relation to the acting edge of the brush, and means permitting relative adjustment of the plate and brush.

31. A heel blacking machine having, in combination, a rotary brush, means for actuating it, a plate extending across one end of the brush and having a shoe-guiding edge comprising a portion remote from the periphery of the brush at one portion of the acting face of the brush and a portion extending substantially to the acting edge of the brush at another portion of said acting face.

32. A heel blacking machine having, in combination, a rotary brush, means for actuating it, and a plate extending across one end of the brush and having a bristle-straightening edge extending eccentrically with relation to the brush and arranged to uncover the acting portion of the brush and to cover an inactive portion of the brush.

33. A heel blacking machine having, in combination, two brushes between which a

heel may be thrust for treating opposite sides thereof, and shoe-guiding means constructed and arranged to limit the backward movement of the heel and to guide the heel into such relation to the acting face of the brush as the breast edge approaches position to receive blacking that the bristles may straighten as they approach said edge.

34. A heel blacking machine having, in combination, two brushes between which a heel may be thrust for treating opposite sides thereof, and shoe-guiding means constructed and arranged to limit the backward movement of the heel and to require the heel to be turned to black it adjacent to the breast edge, said guiding means having an acting face shaped to force the heel outwardly from the brush as it is turned.

35. A heel blacking machine having, in combination, two rotary brushes adapted to black opposite sides of the heel at the same time, and positioning means comprising plates located over said brushes and arranged to limit the movement of the heel into the machine and having acting edges eccentric to the brushes and arranged to guide the heel away from the brushes as it is turned to present the breast edge.

36. A heel blacking machine having, in combination, two rotary brushes adapted to black opposite sides of the heel at the same time, and guiding plates having eccentric shoe-positioning edges coöperating with each brush.

37. A heel blacking machine having, in combination, two rotary brushes adapted to black opposite sides of the heel at the same time, and plates arranged with relation to the two brushes to limit the introduction of the heel and having eccentric shoe-guiding edges to limit the approach of the shoe to different portions of the brush.

38. A heel blacking machine having, in combination, a rotary brush comprising a body portion formed of bristles adapted to coat the side faces of the heel and a relatively thin superposed portion formed of bristles having different characteristics for applying blacking in the rand crease of the shoe, and means for delivering blacking directly to the thin portion, the brush being so positioned that the body portion receives blacking from the thin portion.

39. A heel blacking machine having, in combination, means for supplying blacking comprising a reservoir, a drum adapted to carry blacking on its periphery, a transfer roll arranged in substantial contact with the periphery of the drum beyond the vertical plane of the axis of the drum whereby the blacking is caused to collect in the angle between the drum and transfer roll, means for rotating the drum and the transfer roll, and means to receive the blacking

from the transfer roll and deliver it to the work.

40. A heel blacking machine having, in combination, brushes for treating opposite sides of a heel at the same time, means for supplying blacking thereto comprising a reservoir, a drum, and a transfer roll, and means for continuously driving the drum and the transfer roll, said machine having provision for stripping the brushes and returning the blacking to the reservoir to prevent accumulation of blacking on the brushes when no shoe is in the machine.

41. A heel blacking machine having, in combination, two rotary brushes for applying blacking to the opposite edges of a heel, means for adjusting said brushes from and toward each other into definite relations to act simultaneously upon opposite sides of heels of different widths, and a common driving means for rotating the brushes in their adjusted positions.

42. A heel blacking machine having, in combination, two rotary brushes for applying blacking to the opposite edges of a heel, carrier blocks upon which the brushes are mounted, means for adjusting the blocks from and toward each other, a shaft extending through the blocks and provided with means adapted to coöperate with the brushes in different adjusted positions for driving the brushes.

43. A heel blacking machine having, in combination, two rotary brushes for applying blacking to the opposite edges of a heel, means for adjusting the brushes from and toward one another, heel-guiding plates carried by said brushes, and means connecting said plates to hold them from rotation but permit them to be adjusted with the brushes.

44. A heel blacking machine having, in combination, two rotary brushes for applying blacking to the opposite edges of a heel, heel-guiding plates on the brushes having acting edges eccentric to the brushes and arranged to uncover a maximum width of the brushes at their adjacent sides and to permit the brushes a decreasing extent of projection from the inner sides forwardly.

45. A heel blacking machine having, in combination, a brush for applying the blacking arranged with its acting face at an angle to the horizontal and adapted to treat the rand crease with its upper portion, and means arranged to supply the blacking to the upper portion of the brush and permit the blacking which is not used in the crease to work down upon the part of the brush that coats the edge face of the heel.

46. A heel blacking machine having, in combination, a plurality of rotatable heel blacking brushes arranged on substantially vertical axes to treat different portions of a heel which is moved between them, and

means for delivering blacking upon the upper edge only of the acting faces of the brushes.

47. A heel blacking machine having, in combination, a brush for applying the blacking arranged with its acting face at an angle to the horizontal, and supplying means including a transferer arranged to engage first with the upper edge of said acting face and wipe down across it.

48. A heel blacking machine having, in combination, a blacking brush on a substantially vertical axis, a rotary transferer on a substantially horizontal axis and arranged to wipe from the upper portion of the brush downwardly, and outwardly across the top edge of the brush obliquely, and means for actuating the brush and the transferer.

49. A heel blacking machine having, in combination, a brush for applying blacking, a heel tread rest, on which the heel may be turned in presenting it to the brush, and means for adjusting the rest angularly to support the heel in predetermined relation with the plane of rotation of the brush.

50. A heel blacking machine having, in combination, a brush for applying blacking including a section constructed and arranged to enter the rand crease, a heel tread rest on which the heel may be turned in presenting it to the brush, and means permitting adjustment of the rest angularly for supporting heels of different shapes with the rand crease parallel with the crease-blackening section of the brush.

51. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, and means for stripping the brush, comprising a rotary stripper turning transversely of the movement of the brush and wiping outwardly toward the acting face of the brush.

52. A heel blacking machine, having, in combination, a brush for applying blacking, means for actuating the brush, and means for stripping the brush comprising an eccentric edged plate arranged with said edge extending across the edge of the brush in contact with the end face of the brush.

53. A heel blacking machine having, in combination, a brush for applying blacking, means for actuating the brush, and means for stripping the brush comprising an eccentric edged plate arranged with its edge extending across the edge of the brush in contact with the end face of the brush and means for adjusting the plate relatively to the brush.

54. A heel blacking machine having, in combination, two rotary brushes for blacking opposite edges of a heel thrust between them and turned from side to side, guides for forcing the heel away from the axis of

the adjacent brush as the shoe is turned to apply blacking adjacent to the breast edge, means for adjusting the brushes for large and small heels, and means for adjusting the guides with relation to the brushes when the brushes are adjusted.

55. A heel blacking machine having, in combination, two rotary brushes for blacking opposite edges of a heel thrust between them and turned from side to side, eccentric plates on the ends of the brushes to guide the heel, means for adjusting the brushes from and toward each other, and means for adjusting the plates with relation to the brushes.

56. A heel blacking machine having, in combination, two rotary brushes for blacking opposite edges of a heel thrust between them and turned, shoe-positioning devices, means for adjusting the brushes from and toward each other to adapt them to the widths of heels of different sizes, said machine having provision for automatically adjusting at the same time the positioning devices to adapt them to the length of the heel.

57. A heel blacking machine having, in combination, two rotary brushes for blacking opposite edges of a heel thrust between them, means for adjusting the brushes for heels of different sizes, and means for supplying blacking comprising a reservoir, a drum, and a transferer roll arranged to receive the blacking from the drum and apply it upon the upper edge portions of the brushes.

58. A heel blacking machine having, in combination, an applying brush, means for rotating the brush, and a plate arranged with an edge extending obliquely across the edge of the brush in contact with an end face of the brush, and means for adjusting the plate relatively to the brush in the plane of said end face.

59. A heel blacking machine having, in combination, two rotary brushes for applying blacking to opposite edges of a heel which is thrust endwise between them and turned from side to side, eccentric plates on the ends of the brushes to guide the heel in its endwise and turning movements between the brushes, and means permitting adjustment of the plates with relation to the brushes.

60. A heel blacking machine having, in combination, means for positioning a heel, a brush comprising a bristle section formed and arranged with relation to said positioning means to enter the rand crease, and a guiding section formed and arranged with relation to said positioning means to engage the upper above the rand crease.

61. A heel blacking machine having, in combination, an applying brush, means for

rotating the brush, a plate adjacent to one end of the brush and having an edge eccentric to said brush, said edge being positioned close to the periphery of the brush along the space where the heel is engaged by the brush during the heel blacking operation, but diverging outwardly from the periphery of the brush as it extends away from said space.

62. A heel blacking machine having, in combination, an applying brush, means for rotating the brush, and a plate adjacent to one end of the brush constructed to enter the rand crease of a shoe, said plate having its edge positioned close to the periphery of the brush along the space where the heel is engaged by the brush during the heel blacking operation, but diverging outwardly from

the periphery of the brush as it extends away from said space, said plate being arranged for adjustment relative to said brush. 20

63. A heel blacking machine having, in combination, means for applying blacking to the rand crease of a shoe, means for applying blacking to the heel edge, a blacking reservoir and rotatable conveying means 25 for carrying blacking therefrom to the applying means.

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

FREDERICK M. FURBER.

Witnesses:

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."