

F. M. FURBER.
HEEL BLACKING MACHINE.
APPLICATION FILED JULY 29, 1910.

1,015,433.

Patented Jan. 23, 1912.

3 SHEETS—SHEET 1.

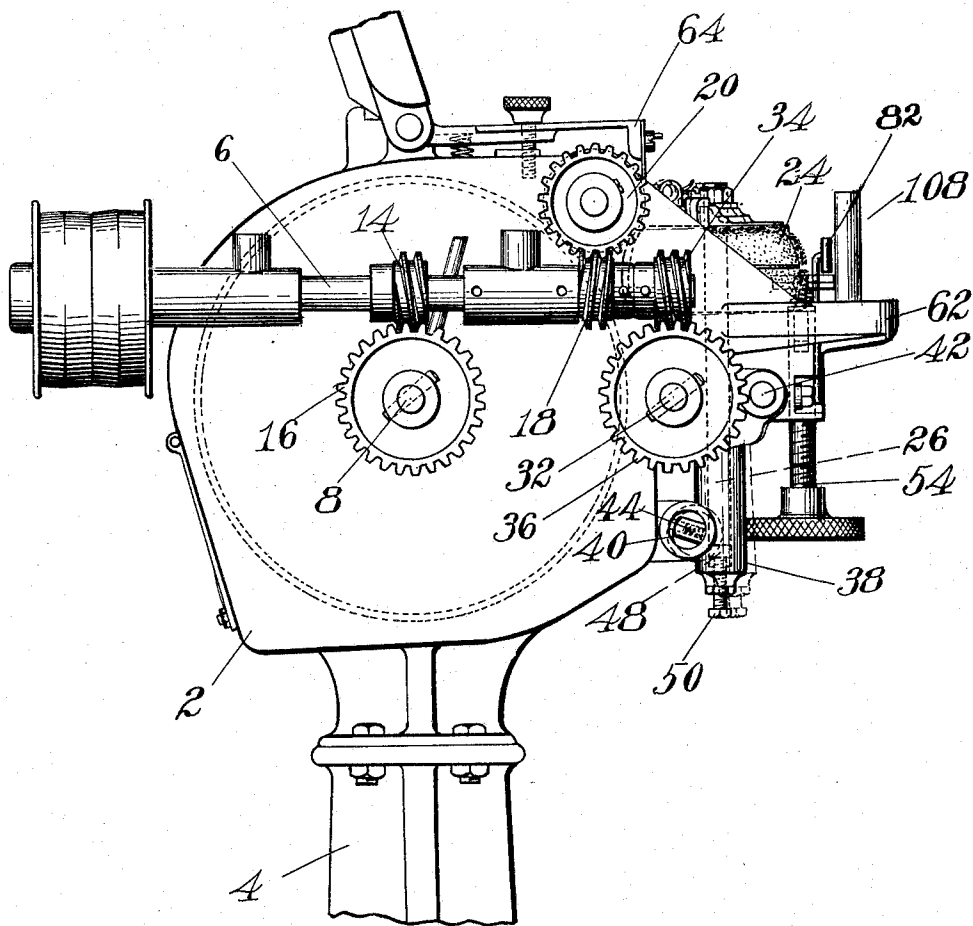


Fig. 1.

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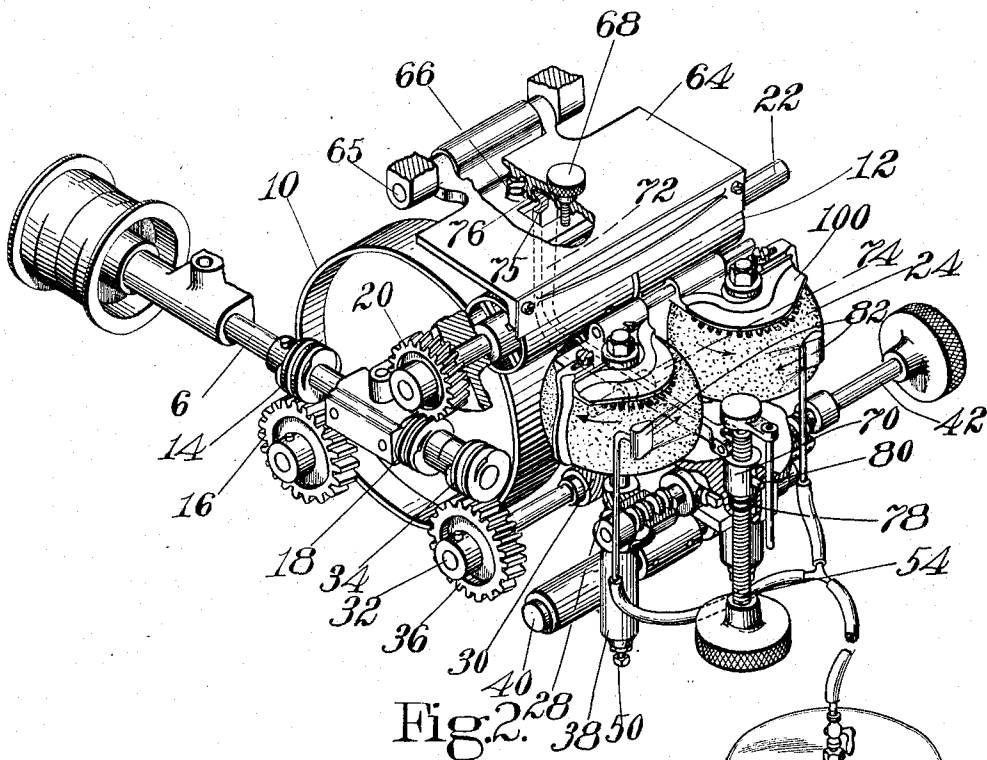


Fig. 2.

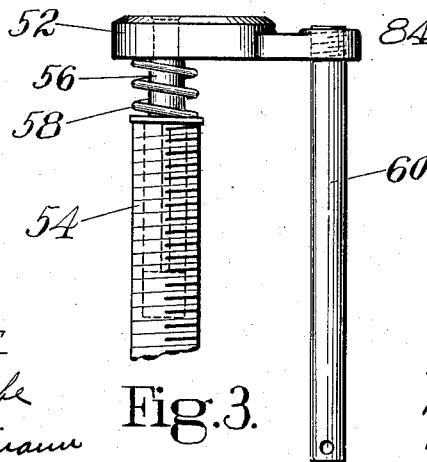


Fig. 3.

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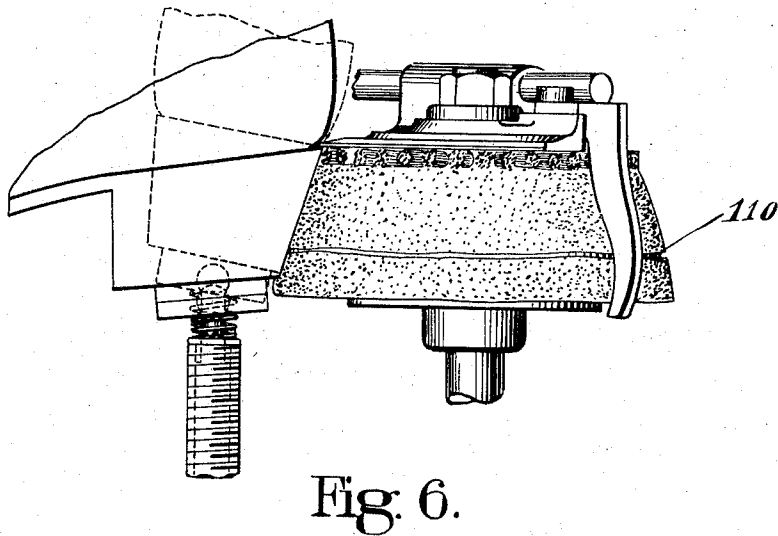
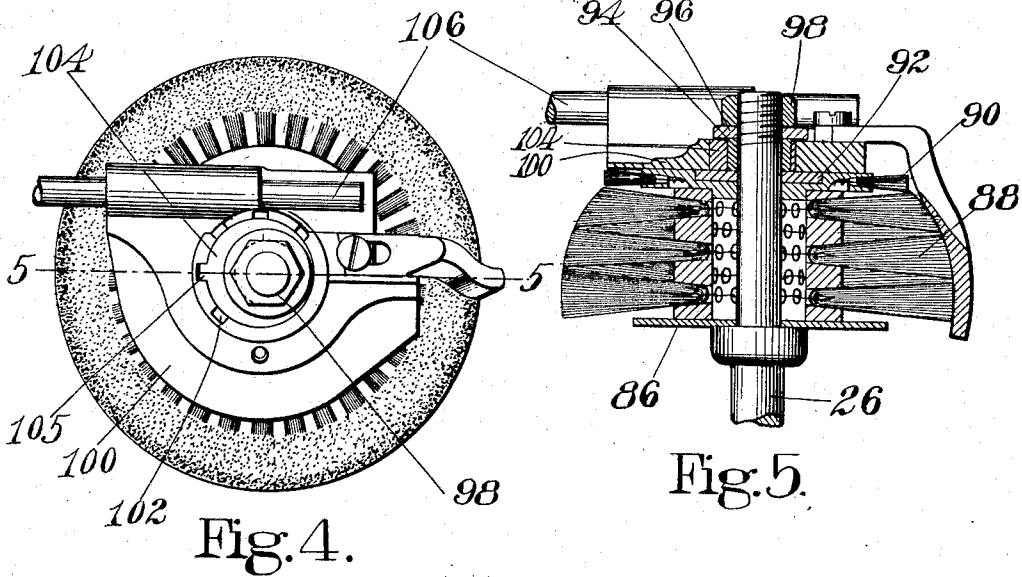
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3 SHEETS—SHEET 3.



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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.

1,015,433.

Specification of Letters Patent.

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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 Suffolk and State of Massachusetts, have invented certain Improvements in Heel-Blacking 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 applying blacking or other coloring matter or finishing material, hereinafter referred to generically as blacking, to boots, shoes and other articles, and particularly to machines for applying blacking to the edges of heels or soles. For convenience, reference will be made herein to the work as the heel, it being understood 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 operated upon.

It is the general object of this invention to so improve the construction of machines of the character referred to, that an improved quality of work will be produced, a saving in blacking will be effected, the life of the brushes will be prolonged and adjustment of the machine and handling of the work will be facilitated.

To these ends the invention contemplates the provision of means whereby, the delivery of blacking to the brushes or other applying means will be controlled by the work. When the brushes are actively applying blacking to the work, it is essential of course, that a suitable quantity of blacking be fed to them; but when the work is withdrawn from the machine, it is desirable to have this delivery of blacking interrupted, since if the machine continues to run idly, even for a short time, the brushes become loaded with blacking to such an extent, that when a heel is again brought into contact with them, some of the surplus blacking will be thrown or spattered onto the parts of the shoe that it is desirable to keep clean. One manner in which it is proposed to accomplish this result is by causing such a relative movement of the applying brushes and the blacking delivering mechanism that when the work is removed from the machine, the delivery of blacking to the brushes will be interrupted.

In the illustrated embodiment of the invention, blacking is conveyed to the applying brushes by a transferring roll and the brushes are so arranged that the heel, while in position to receive blacking therefrom, holds them in contact with the roll; but the instant the heel is removed they are moved automatically out of blacking receiving relation to the roll. It is also contemplated that this result may be secured by rendering the blacking conveying mechanism inoperative when the heel is not in position to be blacked. Mechanism embodying this feature of the invention is illustrated in the accompanying drawings, and comprises a scraper arranged into position to be moved into and out of contact with the blacking transferring roll. The scraper is normally held against the roll and thus prevents delivery of blacking to the brushes. Connections are provided between the scraper and the rest upon which the heel is supported while being blacked whereby the positioning of the heel to the brushes results in moving the scraper away from the roll and permitting the supply of blacking to the applying devices to be resumed. This supply is automatically cut off again by the scraper as soon as the shoe heel is removed from its rest.

In applying blacking to a heel edge it frequently happens that bubbles are formed in the coating of blacking during its application. This phenomenon varies somewhat with the composition of the blacking, but in any case it is objectionable for the reason that as the coating dries, the blacking around the bubble hardens before the bubble bursts and releases the blacking that it has restrained against its natural tendency to spread uniformly over the surface. The result is that the blacked surface when it has dried is covered with rings of blacking that stand out prominently from the surrounding surface, and these rings may still be seen even after the heel has been burnished.

It is an important object of this invention to prevent this injury to the appearance of the shoe heel. I accomplish this object by directing a stream of fluid, preferably air, against the blacked surface before the coat of blacking hardens. In the illustrated embodiment of the invention, I have shown two blacking brushes between which the heel is thrust to apply blacking simultaneously

to its opposite sides and a nozzle is located adjacent to each brush and is arranged in position to direct a blast of air against the blacked surface of the heel as it leaves the brush. Air is delivered to the nozzles from any convenient source. This arrangement produces the result of breaking the bubbles immediately after the blacking is applied to the heel, thus facilitating the natural tendency of the blacking to spread uniformly over the surface, and furthermore the impact of the air against the coating of blacking positively aids in distributing the blacking uniformly. This blast of air produces the further advantage of exerting a drying action on the blacking.

Machines of this character usually are provided with a plate or equivalent device positioned adjacent to the brush arranged to enter the rand crease during the heel blacking operation to guide the heel relative to the brush and usually arranged also to act as a guard to prevent smearing the upper with blacking.

A further feature of this invention consists in a novel arrangement whereby a relative adjustment of the brush and guiding plate may be effected. According to the preferred construction the rand guiding plate is mounted on an eccentric bushing which preferably is supported on the shaft that carries the applying brush. The bushing may be rotated about the shaft to vary the position of the plate relative to the shaft and the brush. One advantage of this construction is that the edge of the plate may be varied relative to the periphery of the brush as the brush wears down.

The invention also comprises other features which will appear in the following description and will be included in the appended claims.

In the accompanying drawings, Figure 1 is a side elevation of the machine embodying the present invention; Fig. 2 is a perspective view showing the operating parts of the machine without the frame; Fig. 3 is a detail view of the work support; Fig. 4 is a plan view of the blacking applying brush and guiding plate; Fig. 5 is a sectional view taken on the line 5—5, Fig. 4; and Fig. 6 is a view in side elevation showing a modified form of work support and brush.

The machine comprises a reservoir 2 that is supported on a post 4 and carries bearings for a main driving shaft 6 having fast and loose pulleys thereon. The reservoir also has a bearing for a shaft 8 on which is mounted a drum 10 that revolves in the reservoir and conveys blacking to a transferring roll 12. The drum is driven by means of a worm 14 on the shaft 6 meshing with a worm gear 16 on the drum shaft 8. The transferring roll 12 is revolved in the same

direction as the drum by means of a worm 18 on the driving shaft running in mesh with a worm gear 20 on the roll shaft 22. The roll wipes down across the upper edges of two applying brushes 24 and delivers blacking to the brushes at these points. The brushes are mounted on vertical shafts 26 which carry worm gears 28 meshing with worms 30 on a shaft 32. A worm 34 on the shaft 6 drives a worm gear 36 fast to the shaft 32 and through the connections just described rotates the brushes 24 in opposite directions. Each of the shafts 26 is mounted in a block 38. For the purpose of adjusting the brushes toward and from each other to accommodate different sizes of shoes, the blocks 38 are mounted on a guide rod 40 and are apertured to receive an adjusting rod 42 which is provided with oppositely threaded portions at the points where it passes through the blocks. By turning the rod 42 the blocks 38 and shafts 26 carried thereby will be moved toward or from each other.

One arrangement for interrupting the delivery of blacking to the brushes when the machine is running idly is illustrated in Fig. 1. The guide rod is supported at its middle in a projection in the frame but is flattened at both ends where it passes through the holes in the blocks 38 and is of less diameter at these portions than the holes. In each flattened portion a hole is drilled to receive a spring 44 and a plunger. It will be clear from an inspection of Fig. 1 that since the rod 40 is rigidly supported the springs 44 tend to swing the blocks 38 about the rod 42 as a pivot in a clockwise direction. Normally therefore the brushes 24 will be held out of contact with the transferring roll 12 and will receive no blacking therefrom. But when the heel is thrust in between the brushes, it will tip them about the rod 42 against the pressure of the springs 44 into contact with the roll 12 where blacking will be conveyed to them. The instant the heel is removed from the brushes they will be moved out of blacking receiving position again. As the roll 12 wipes down across the edges of the brushes, it in time wears off the bristles along this portion and it then becomes desirable to adjust the brushes toward the roll to compensate for such wear. In the machine shown the brush shafts 26 are supported on plates 48 within the blocks 38 and the plates may be raised or lowered to move the brushes up or down by means of adjusting screws 50 bearing against the bottoms of the plates. This mechanism also provides a convenient arrangement for adjusting the brushes to determine the quantity of blacking delivered to them by the conveying roll.

For properly positioning the heel with relation to the brushes a tread rest 52 is

provided. This rest preferably consists of a plate somewhat smaller than the top lift of the smallest shoe to be blacked so that blacking will not be smeared upon the rest and from thence onto the tread face of the next shoe placed thereon. The rest is supported on an adjustable bolt 54, the upper end of which is drilled to receive a pin 56 secured to the plate 52. A comparatively stiff spring 58 surrounds the rod 56 and is interposed between the upper end of the bolt 54 and the plate 52. In order to prevent the plate from turning relative to the frame a rod 60 is connected thereto and is guided through a hole in the frame shelf 62.

In addition to the arrangement above described for preventing the delivery of blacking to the brushes when the work is not in position to be blacked, the machine illustrated also comprises another construction for effecting this result, which may be used either in combination with that already described or independently of the same. This mechanism (see Fig. 2) comprises a scraper 64 extending the entire length of the transferring roll 12 and pivoted on top of the reservoir at 65 in position to be moved into or out of contact with the roll 12. A spring 66 positioned between the scraper and machine frame normally holds the scraper out of contact with the roll. The upward movement of the scraper is limited by an adjusting screw 68 which extends through the scraper and is threaded into the frame. In order to move the scraper into engagement with the conveying roll and to control its movement away from the roll, connections are provided between the scraper and the tread rest. These connections comprise a collar 70 through which the bolt 54 is threaded and an L-shaped lever 72 pivotally connected thereto and fulcrumed at 74. One end of the lever rises under the scraper 64 and has its tip 75 turned over horizontally and beveled off to engage with the beveled face of an angular projection 76 depending from the lower side of the scraper. A spring 78 seated in a pocket formed in the frame below the collar 70 holds the latter normally in its elevated position. The collar is prevented from turning by a pin 80 secured in the frame and projecting into a vertical slot formed in the collar.

In operation, the workman places the shoe on the support 52 and presses the heel down firmly to position the rand guiding plates in the rand crease. This movement depresses the collar 70 against the tension of the spring 78 and moves the tip 75 of the lever upwardly and forwardly thus releasing the scraper 64 to the action of the spring 66 which immediately raises it. The entire surface of the conveying roll now becomes covered with blacking which is delivered to the upper edges of the brushes. The in-

stant the heel is removed from the rest 52, the spring 78 raises the collar 70 and swings the lever tip 75 into engagement with the projection 76, thus moving the scraper down against the tension of the spring 66 into contact with the roll 12, stopping the delivery of blacking to the brushes.

A pair of nozzles 82, best shown in Fig. 2, are supported in the shelf 62 one adjacent to each of the applying brushes. The nozzles are connected through suitable pipes and controlling devices with any convenient source of air supply such as a tank of compressed air as illustrated at 84. Each of the nozzles has a discharge opening in the form of a slit which is so located that a blast of air is directed along the surface of each brush at the point where the heel leaves the brush. This mechanism is provided for the purpose of destroying the bubbles that form in the coating of the blacking on the heel and aiding in the uniform distribution and drying of the blacking as hereinbefore described.

The brushes shown in detail in Figs. 4 and 5 are mounted on shafts 26 in a novel manner. Each shaft has a shoulder formed thereon on which rests a supporting plate 86. The brush preferably consists of two sections, a thick soft bristle section 88 and a thin section 90 of shorter and stiffer bristles. The hub of the thick section rests upon the plate 86 and is centered on the shaft 26 by the hub of the thin section which rests upon the first hub, but has an annular boss fitted snugly between the shaft and the collar. As the metal of the hubs is rather soft, the upper hub is recessed to receive a large steel washer 92 which overlies the lower hub and thus affords a strong bearing for the cylindrical bushing 94, washer 96 and nut 98 that constitute the means for clamping the brush sections securely on to the shaft for rotative movement therewith. Each of the brushes carries also a guiding plate 100 having an edge designed to enter the rand crease during the heel blacking operation to guide the shoe relative to the brushes and to prevent smearing the upper above the rand crease with blacking. This plate rests upon the upper hub 90. For the purpose of rendering the plate 100 adjustable relative to the brush an aperture is formed therethrough and a plurality of notches 102 are formed in the walls of the aperture. An eccentric bushing 104 is received within the aperture and has a projection 105 designed to enter any one of the notches 102 to hold the bushing against movement relative to the plate. The eccentric bushing is not as thick as the bushing 94 that usually surrounds the shaft and therefore is not clamped to the brush for rotative movement therewith. The plates 100 are positively held against rotation by a

rod 106 which passes through both of them. When it is desired to adjust the plate 100 to compensate for wear of the brush or for any other reason, it is merely necessary to remove the nut 98 and washer 96, raise the eccentric bushing 104 out of its aperture and replace it again with the projection 105 in that notch 102 which will bring the plate and brush into the desired relationship. The washer 96 and nut 98 may then be replaced.

In blacking a shoe heel with this machine, the shoe is placed with the tread face of the heel on the plate 52 and the guiding plate is entered in the rand crease. The positioning of the shoe raises the scraper 64 and tips the brushes backwardly into engagement with the conveying roll 12, as previously described. The shoe is then turned quickly from one side to the other to bring both sides and the rear end of the heel into contact with one or the other of the brushes and is then removed from the machine. Suitable stops, one of which is indicated in Fig. 1 at 108, may be supported in the shelf 62 to limit the movement of the shoe for the purpose of preventing its being turned far enough in either direction to daub blacking on to the heel breast. The blacking is delivered directly to the upper thin sections of stiff bristles 90 and works downwardly through the brushes. At the point where the blacking is applied to the rand crease, the blacking appears to dam up between the heel and the stiff bristles and the lower side of the rand guiding plate so that the rand crease is flooded and therefore thoroughly coated. Sufficient blacking works down through the thick section of bristles to apply an even coating to the sides of the heel.

Fig. 6 shows a modified form of work rest in which the work supporting plate is mounted on a ball ended stud and therefore is afforded considerable freedom of angular movement. This construction is advantageous in treating heels having considerable pitch and which require to be tipped through different angles in blacking the sides and ends of the heel. The brush shown in this figure is provided with a guiding disk 110 located near the lower end of the thick section of bristles and which coöperates with the plate 100 to guide the shoe properly, as it is presented to the brush.

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

1. A machine of the class described comprising blacking applying means, driven means for conveying blacking to the applying means and provision whereby the delivery of blacking to the applying means is controlled by the work.

2. A machine of the class described com-

prising a blacking applying device, means including a driven conveying mechanism for delivering the blacking to said device and means for interrupting the delivery of blacking to the applying device when the work is not in position to receive blacking therefrom, said last named means being arranged for operation on the positioning of the work to the applying device to cause the delivery of blacking to be resumed.

3. A machine of the class described comprising a blacking applying device, mechanism including a conveying roll for delivering blacking to said device and means for controlling the delivery of blacking by the roll to the applying device, said means being controlled in its operation by the work.

4. A machine of the class described comprising, in combination, means for applying blacking to the heel of a shoe, driven means for conveying blacking to the applying means and means for rendering said conveying means inoperative when the heel is not in position to be blacked.

5. A machine of the class described comprising in combination a blacking applying device, mechanism including a conveying roll for delivering blacking thereto, means coöperating with said roll to interrupt the delivery of blacking to the applying device, means for rendering the interrupting means inoperative, and means for rendering said interrupting means operative, the last named means being subject to the control of the work.

6. A machine of the class described comprising in combination a blacking applying brush, mechanism including a conveying roll for delivering blacking thereto, a scraper arranged in operative relation to the roll to control the delivery of blacking from the roll to the brush, means under control of the work for moving said scraper away from the roll and means for moving the scraper toward the roll when the work is withdrawn from the machine.

7. A machine of the class described comprising in combination a blacking applying brush, mechanism including a conveying roll for delivering blacking thereto, a scraper arranged for movement toward and from said roll, means for yieldingly holding the scraper in contact with the roll, said means being arranged for movement by the work to release the scraper and means for yieldingly moving the scraper away from the roll when it is released from said holding means.

8. A machine of the class described comprising in combination a blacking applying brush, mechanism including a conveying roll for delivering blacking thereto, a scraper arranged to be moved toward and from the surface of said roll, means for yieldingly holding the scraper away from the roll, a

work rest, connections between the work rest and scraper and a spring acting through said connections to overcome the action of the yielding means and to hold the scraper normally in contact with the roll.

9. A machine of the class described comprising in combination two blacking applying rolls mounted to operate simultaneously on opposite sides of the heel thrust between them, means including a conveying roll running in contact with said brushes to deliver blacking thereto, a pivoted scraper arranged to contact with said roll, a spring acting on said scraper to move it out of contact with the roll, means for limiting the movement of said scraper away from the roll, a heel rest positioned adjacent to said brushes, a lever operatively connecting said scraper and heel rest and a spring tending to move said heel rest and lever and therethrough to move the scraper into contact with the roll.

10. A machine of the class described comprising in combination an applying device, driven means for delivering blacking to said device and provision for effecting automatically a relative movement of said device and said means upon the removal of the work from the machine to interrupt the delivery of blacking to the applying device.

11. A machine of the class described comprising in combination a rotary blacking applying device, conveying means for delivering blacking to said device, the applying device being arranged for movement into and out of blacking receiving position relative to the conveying means but adapted to be held in the blacking receiving position by the work and means for moving the device away from the conveying means automatically when the work is removed from the applying device.

12. A machine of the class described comprising in combination a rotary blacking applying brush, driven conveying mechanism for delivering blacking to said brush and means for yieldingly holding said brush out of blacking receiving relation to the conveying mechanism, the brush being arranged to be moved into blacking receiving position by the work.

13. A machine of the class described comprising in combination a blacking applying brush, a rotary shaft supporting said brush, a rotatable conveying roll arranged to deliver blacking to said brush, a pivoted support for said shaft rendering said brush movable into and out of blacking receiving relation to the roll and a spring arranged to hold said brush out of blacking receiving position.

14. A machine of the class described comprising in combination a pair of vertical shafts, a rotary brush mounted on each shaft, a horizontal conveying roll arranged to deliver blacking to the upper edges of

said brushes, a pivoted bearing block for each of said shafts, a horizontal rod supported in the machine frame and passing through both of said blocks and a spring and plunger supported by said rod within each of said blocks arranged to act upon the blocks in a direction to urge the brushes away from the conveying roll.

15. A machine of the class described comprising in combination two rotatable brushes designed to apply blacking to the opposite sides of a heel thrust between them, two nozzles positioned, one adjacent each brush, to deliver a stream of air against the blacked surface of the heel as it leaves the brush and a source of air supply connected with said nozzles.

16. A machine of the class described comprising a shaft, a brush mounted thereon, a stationary guiding plate adjustable relatively to said brush and positioned close to the end of the latter and means intermediate said shaft and plate for maintaining the plate in adjusted relation to the brush.

17. A machine of the class described comprising in combination a shaft, a brush mounted thereon, a stationary guiding plate positioned at one end of said brush and an eccentric bushing cooperating with said shaft and plate whereby the plate may be adjusted relatively to the brush.

18. A machine of the class described comprising a rotary shaft, a brush mounted thereon, an adjustable guiding plate mounted at one end of said brush, said plate having an aperture formed therethrough with a series of notches formed in the walls of the aperture, an eccentric bushing interposed between said shaft and the walls of said aperture, said bushing being provided with a projection shaped to fit within any one of said notches and means for preventing said plate from rotating with said brush.

19. A machine of the class described comprising in combination a shaft, a hub carrying a thick section of soft bristles, a second hub carrying a relatively thin section of stiff bristles, a bushing bearing on said second hub, means cooperating with said bushing to clamp the bushing and said hubs to the shaft for rotative movement therewith, an eccentric bushing surrounding the first mentioned bushing, a guiding plate positioned at the end of said second hub and having an aperture in which said eccentric bushing is received and means for preventing said plate from rotating with said brush.

20. A machine of the class described comprising in combination a rotary shaft, a hub carrying a thick section 88 of soft bristles, a support carried by said shaft for said hub, a second hub carrying a relatively thin section 90 of stiff bristles, the second hub resting upon the first, a plate 92 set into said second hub and overlying the first hub, a

bushing 94 surrounding said shaft and bearing upon said plate, a nut for clamping said parts securely to said shaft for rotative movement therewith, an eccentric bushing 104 surrounding the first mentioned bushing and a rand guiding plate supported by the eccentric bushing and resting upon the hub of the thin section of bristles.

21. A machine of the class described comprising in combination a rotary brush, driven means for delivering blacking to one edge of said brush and provision for rendering said brush and means relatively adjustable toward and from each other.

22. A machine of the class described comprising in combination a rotary brush, a conveying device rotatable in a plane transverse to the plane of rotation of said brush for delivering blacking to one edge of said brush and provision for rendering said brush adjustable toward and from said device.

23. A machine of the class described comprising in combination a rotary brush, a conveying roll arranged to deliver blacking to one edge of said brush, and means for adjusting said brush axially to vary its relation to said roll.

24. A machine of the class described comprising in combination a rotary blacking applying brush, a vertical shaft on which said

brush is mounted, a horizontal conveying roll arranged to wipe downwardly across the upper edge of said brush to deliver blacking thereto, a bearing in which said shaft is mounted, a plate supporting the lower end of said shaft, and an adjusting screw bearing against the lower side of said plate to effect axial adjustment of the shaft and brush.

25. A machine of the class described comprising in combination a supporting frame, a pair of rotatable brushes arranged to apply blacking simultaneously to opposite sides of a heel thrust between them, and a tread rest to position the heel as it is presented to the brushes comprising a plate substantially circular in form and smaller than the top lift of the heel, an adjusting bolt on which said plate is supported, a pin depending from said plate and received in an axial recess in said bolt, a spring interposed between the bolt and plate and a rod secured to said plate and guided in an aperture in the frame.

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

FREDERICK M. FURBER.

Witnesses:

JOHN H. MCCREADY,
FREDERICK L. EDMANDS.

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