

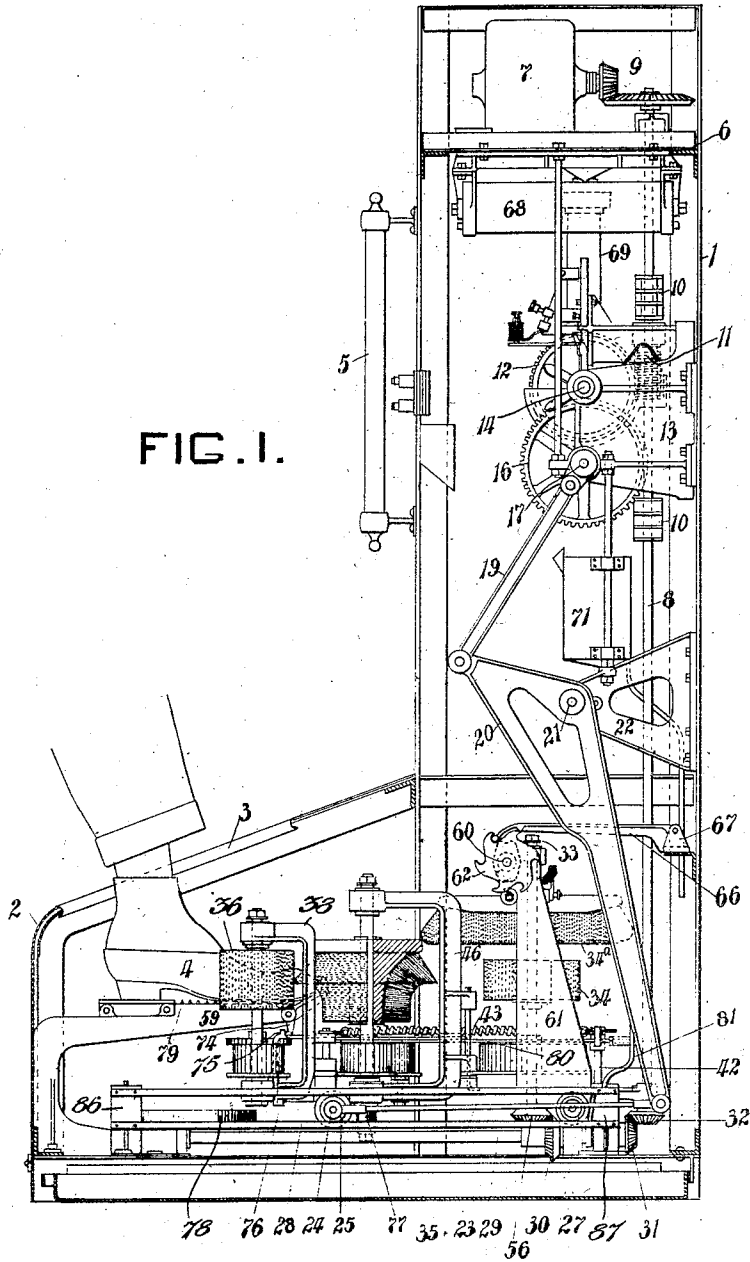
R. R. McELHANY.
SHOE SHINING MACHINE.
APPLICATION FILED SEPT. 19, 1911.

1,063,991.

Patented June 10, 1913

3 SHEETS-SHEET 1.

FIG. 1.



WITNESSES.

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3 SHEETS—SHEET 2.

FIG. 2.

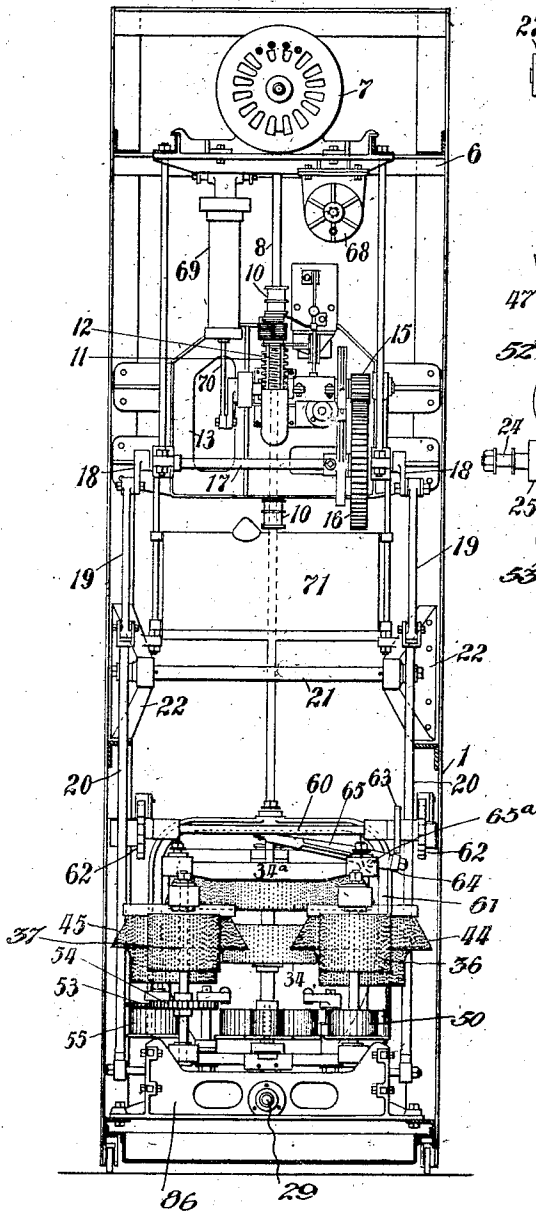


FIG. 3.

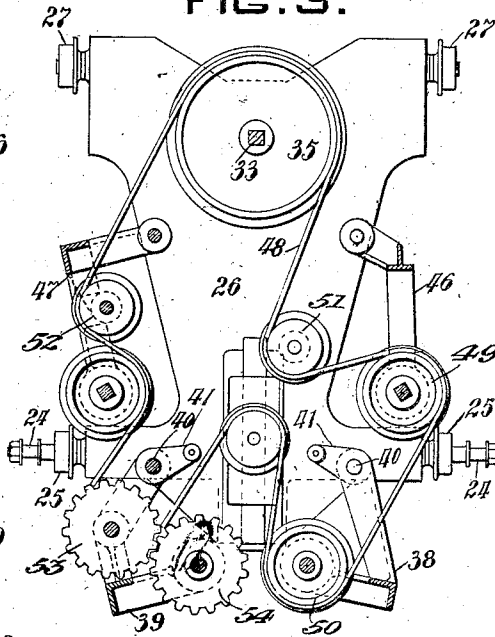


FIG. 6.

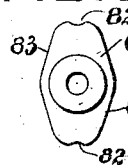
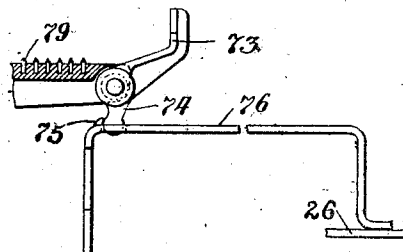


FIG. 7.



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3 SHEETS—SHEET 3.

FIG. 4.

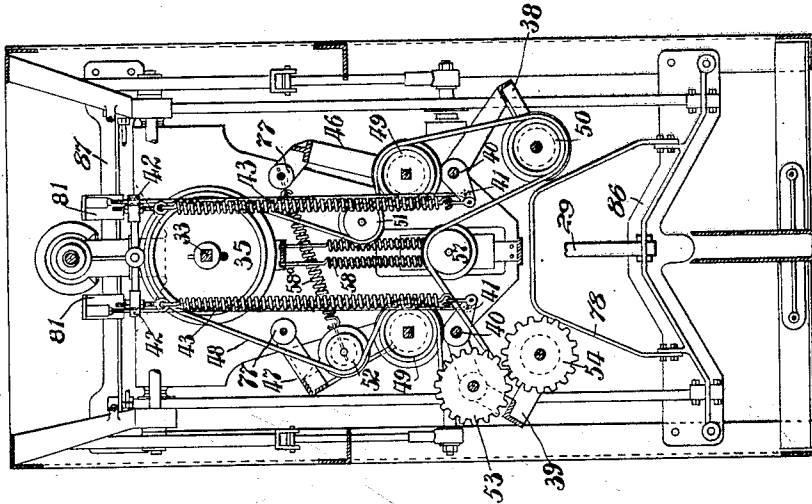
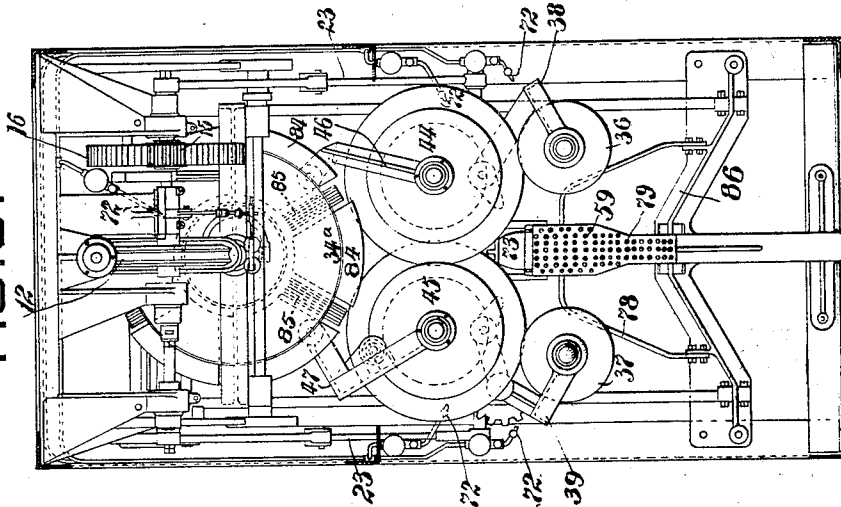


FIG. 5.



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SHOE-SHINING MACHINE.

1,063,991.

Specification of Letters Patent.

Patented June 10, 1913.

Application filed September 19, 1911. Serial No. 650,249.

To all whom it may concern:

Be it known that I, ROBERT R. McELHANY, a resident of Pittsburgh, in the county of Allegheny and State of Pennsylvania, have invented a new and useful Improvement in Shoe-Shining Machines, of which the following is a specification.

My invention relates to machines for automatically polishing boots and shoes and it has for its object to provide a machine of this character which shall be particularly strong and durable in structure and reliable and effective in operation, and in which the power for driving the polishing brushes shall be simply and effectively applied by such means as shall be free from liability to displacement or breakage.

In the accompanying drawings Figure 1 is a view, partially in side elevation and partially in section, of a machine embodying my invention, certain parts being omitted for the sake of clearness; Fig. 2 is a front elevation of the machine shown in Fig. 1, the front wall of the casing and the foot rest being omitted; Fig. 3 is a view, mainly in plan but partially in section, of the brush carriage and the brush-operating mechanism, the brushes being removed; Fig. 4 is a sectional view of the frame and a plan view of the brush carriage and the brush-operating mechanism, the carriage being shown in its rearward position; Fig. 5 is a plan view of the machine shown in Figs. 1 and 2, the electric motor being omitted and the frame being shown in section; Fig. 6 is a detail view of the cam for operating the polishing brush and Fig. 7 is a detail view of the toe hook and its operating mechanism.

The frame work 1 for inclosing the mechanism embodying my invention is of skeleton form and is surrounded and inclosed by a suitable casing 2, only a portion of which is shown in Fig. 1, such portion being provided with an opening 3 for the insertion of a shoe 4 to be polished. The front of the casing is also provided with rods 5 to be grasped by the individual who is making use of the machine.

At or near the top of the frame work is a platform 6 upon which is mounted an electric motor 7, and, mounted in suitable bearings at the rear of the frame is a vertical shaft 8, the upper end of which is geared

to the electric motor by means of beveled gearing 9, as indicated. The shaft 8 comprises three sections which are connected together by suitable couplings 10, and the middle section is provided with a worm 11 which meshes with a worm wheel 12 to drive shaft 14. Shaft 14 carries a gear 15 that meshes with a gear wheel 16 mounted upon a shaft 17, bearings for which are provided in the bracket 13. The shaft 17 is provided with crank arms 18, the free ends of which are joined to the upper ends of rods 19. The lower ends of the rods 19 are connected to the outer ends of the shorter arms of bell crank levers 20. The bell crank levers are mounted upon a shaft 21 having bearings in brackets 22 which are fastened to the frame. The free ends of the longer arms of the levers 20 are connected by means of rods 23, to a shaft 24 that is provided with guide wheels 25 for a carriage 26. Other supporting and guide wheels 27 for the carriage are also provided, which, together with wheels 25, rest and move upon guide rails 28, connected at their ends with forward and rear supports 86, 87, on a suitable base or frame.

Journaled in suitable bearings upon the base of the frame 1, beneath the carriage, is a shaft 29 that is either square in cross section or is otherwise so formed as to receive a bevel gear wheel 30 and rotate the same as the shaft is rotated and also permit longitudinal movement thereof. The shaft 29 is rotated by means of a bevel gear 31 which meshes with a corresponding gear wheel 32 on the lower end of the shaft 8 which is geared to the electric motor 7.

Mounted near the rear end of the carriage 26 is a vertical shaft 33, preferably square in cross section, having thereon a toe brush 34 and a polishing brush 34^a for the toe and top portion of a boot or shoe and having also a driving pulley 35, the polishing brush 34^a having such connection to the shaft as to permit it to be moved vertically, independently of any movement of the shaft but being rotatable with the shaft, in a manner well known. The toe brush 34 is intended mainly for preliminary cleaning of the toe of the shoe and for the application of blacking thereto and is constructed wholly of bristles. The polishing brush 34^a

is intended to give a final polished finish to the shoe and for this purpose is constructed of two sets of segments 84 and 85, the segments 84 being formed of bristles and the segments 85 of felt or some similar material. A pair of heel-polishing brushes 36 and 37 are mounted near the other end of the carriage upon the outer ends of angular frames, 38 and 39, which are pivotally supported by means of shafts 40 having suitable bearings. Arms 41 project inwardly from the shafts 40 and their free ends are connected to standards 42, mounted on the carriage, by means of helical springs 43 so that, as the carriage is moved toward the shoe to be polished, the frames 38 and 39 will be turned inwardly and thus carry the brushes inwardly toward the shoe and finally behind the heel when the carriage has moved the requisite distance in a forward direction.

To provide for easy insertion of the foot into proper position for polishing, the heel brushes 36, 37 are arranged to be held away from the shoe while the brush carriage is in its rearmost position and during the very first portion of its forward motion. This result is accomplished by the provision of heel rods 80 which are pivotally attached at one end to the arms 41 and at their other ends slide loosely through the standards 42 on the carriage. The rods 80, at their rearward ends are intended to contact with stops 81 fastened to the frame of the machine, on rearward motion of the carriage and be pushed forward during the last portion of its motion, thus causing the brushes 36 and 37 to swing outwardly from the shoe.

Two undercut brushes 44 and 45 for polishing the sides of a shoe are respectively mounted upon angular frames or yokes 46 and 47 that are pivotally mounted upon the carriage in such positions as to locate their brushes between the brush 34 and the brushes 36 and 37. These brushes are mounted upon square shafts (Fig. 3) and have a "floating" adjustment of an inch or so to compensate for different thicknesses of shoes. The frames 46 and 47 are normally drawn toward each other or toward the central longitudinal line of the machine, the frame 46 by the tension of the belt 48, and the frame 47 by the spring 58^a which is fastened at one end to the frame 47 and at the other to a convenient fixed point. The side brushes are intended to operate only upon approximately the front half of a shoe and for this reason the frames 46 and 47 at their lower portions are each provided with a roller 77 which, at about the middle of the forward motion of the brush contacts with a double inclined guide bar 78 fastened to the frame of the machine.

The brushes hereinbefore mentioned are all rotated from the shaft 33 upon which the main or toe-polishing brush is mounted

by means of a belt 48 and the pulley 35 on the toe-brush shaft, pulleys 49 on the side-brush shafts, a pulley 50 on one of the heel-brush shafts, guide pulleys 51 and 52, gear wheels 53 and 54 and a pulley 55 on the shaft of gear wheel 53, the toe-brush shaft being driven by means of a bevel gear-wheel 56 that meshes with the wheel 30 on the shaft 29. In order to make the belt 48 effective in its operation during the swinging movements of the heel and side brushes, the pulley 51 is mounted on the carriage frame and the pulley 52 on the frame 47 between the main pulley 35 on the toe-brush shaft and the pulleys 49 on the side-brush shafts, and a third take-up pulley 57 is mounted upon a support which is free to slide in bearings longitudinally of the carriage except as it is restrained by means of two helical springs 58, the belt being thus held under sufficient tension, at all times, to insure rotation of the brushes and contact thereof with the shoe. As indicated above, I provide the shaft of the heel-brush 37 with a gear wheel 54 which meshes with a gear wheel 53 in order that the belt may cause the pulley 55 to rotate the said brush.

In order to raise and lower the toe polishing brush 34^a with reference to a shoe on the shoe rest 59, I mount a shaft 60 in suitable standards 61 on the carriage and provide the shaft with ratchet wheels 62 and with a cam 63 that is so located as to be in position to engage a roller 64 on the end of a lever 65, pivoted, as at 65^a, on a part of one of the standards 61, the end of the lever opposite the roller being connected to the brush 34^a, so that, as the cam is rotated, it depresses the end of the lever having the roller and thus raises the opposite end to elevate the brush. As shown in Fig. 1 and more particularly in Fig. 6, the cam 63 is provided with high portions 82 and low portions 83, the high portions 82 each extending for a distance of about one-sixth of the circumference of the cam. This cam is in arrangement a double one and is intended to secure proper operation of the polishing brush 34^a during the complete polishing of two shoes. Three reciprocations of the carriage are necessary for polishing a single shoe and during the first of these the roller 64 is in contact with one of the high portions 82 of the cam, the polishing brush then being out of operation. During the last two reciprocations of the carriage, the roller 64 is in contact with a low portion 83 of the cam and the polishing brush engages the shoe with full pressure. In order to secure proper timed relation of the ratchet wheels 62 and cam 63, I provide pawls 66 that are hinged to brackets 67 on the frame and extend over the ratchet wheels 62 so that, when the carriage is moved rearwardly, the pawls will engage the ratchet wheel and

thus turn the cam to operate the brush-actuating lever 65.

The shoe rest 59 is provided on its upper surface with a comparatively large number of sharply pointed upwardly projecting pegs which by engagement with the sole of the shoe tend to resist the side thrust of the polishing brush 34^a during operation. At its forward portion, the shoe rest 59, as shown in Fig. 7, is further provided with a toe hook 73 which normally projects upwardly in front of the shoe and forms a stop for properly positioning the same prior to polishing thereof. The toe hook 73 is pivoted upon the shoe rest 59 and is provided with a downwardly extending lever 74 which projects into the path of a lug 75 upon a bar 76 fastened to a permanent part of the brush carriage. Upon rearward motion of the carriage this lug 75 contacts with the lever 74 and raises the toe hook into position. At the beginning of the forward motion of the carriage, however, the lug 75 moves out of contact with the lever 74 and the toe hook drops of its own weight, thus giving room for the operation of the brushes and full contact thereof with the shoe.

While the apparatus for supplying polishing material to either the brushes or shoes to be polished may be of any desired kind, so far as structural features are concerned, I will briefly describe the elements which I have embodied in my apparatus for supplying such material. I provide an air-storage tank 68 in the upper part of the casing and, adjacent thereto, I mount an air pump 69, the piston rod 70 of which is suitably connected to the worm wheel 12 in order that air may be compressed and supplied to the tank for use, as desired. At a lower point in the frame work I support a tank 71 of polishing liquid and connect the air and liquid tanks by means of suitable pipes to spraying nozzles 72 that are properly located in order that the liquid may be sprayed upon the brushes for application to the boot or shoe to be polished. Of course the spraying nozzles may be so located as to spray the liquid upon the shoes direct, if so desired.

The manipulation of suitable valves for controlling the supply of air and liquid to the spraying nozzles may be effected by means of any suitable devices such as are well known in the art and are adapted for operation by the motor and the gearing. It will be also understood that any well known means may be employed for automatically interrupting the circuit of the electric motor and that any suitable prepayment devices may be used in connection with the spraying mechanism by means of which the insertion of a coin of the proper size and weight will serve to so release some

portion of the mechanism that the manipulation of a lever or button will serve to start the machine in operation. It is not believed to be necessary to describe in detail these features of construction for automatically stopping the movement and for starting it by means of a coin and subsequent manipulation by pressure of an external push button or lever, since such devices are well known in the art and in general use.

In making use of the machine, the boot or shoe to be polished is placed upon the rest and the motor is started in accordance with the usual practice. The brushes will all be rotated by means of the shaft 8, the bevel gear wheels and the belt and cooperating pulleys and the brush carriage will start forward toward the shoe upon its supporting and guiding tracks. At the beginning of the travel of the carriage, the toe hook will drop downwardly and the heel-brushes will move inwardly engaging with the shoe at about its middle portion. Upon further movement of the carriage in a forward direction, the heel-brushes will move inwardly around the heel of the shoe under the influence of the springs 43. At the same time the side brushes 44, 45 will have engaged with the forward portion of the shoe and upon reaching the middle portion thereof will be moved outwardly away from contact with the shoe by the engagement of the rollers 77 with the inclined portions of the guide bar 78. The weight of the side brushes 44, 45 and their "floating" adjustment on their driving shafts will cause them to adjust themselves to the particular shoe being operated upon. Further motion of the carriage will bring the toe-brush 34 into engagement with the end of the shoe. During this first forward movement of the carriage, the roller 64 has been in contact with a high portion 82 of the cam 63 and the polishing brush 34^a entirely out of contact with the shoe. On the first return movement of the carriage, the actions of the brushes are the same in the reverse order. The first complete reciprocation of the carriage merely accomplishes the preliminary cleaning and brushing of the shoe. As the carriage reaches its rearward position the ratchet 62 is moved one notch and the polishing brush 34^a is lowered into operating position. At the beginning of the second outward reciprocation, blacking is sprayed upon the heel, side and toe-brushes. These brushes then deliver the blacking to the shoe and start to shine it, the polishing brush also acting upon the top of the shoe. On the third reciprocation, except that no blacking is supplied, the operation is the same, all brushes operating to shine the shoe and give it its final polish. At the end of the third reciprocation, the ratchet 62 is moved a third time and the second high portion 82 of

the cam raises the polishing brush to its idle position. The machine is then automatically stopped in the usual manner and is in condition for polishing another shoe or for re-polishing the same shoe, in accordance with the particular adjustments of the motor stopping device.

What I claim is:—

1. In a shoe polishing machine, the combination of a horizontally movable carriage, means for imparting a reciprocatory movement thereto, a toe-polishing brush, a pair of side brushes and a pair of heel-brushes each rotatably mounted upon said carriage upon a vertical axis, means for rotating said brushes, and means for raising the toe-polishing brush to maintain the same out of contact with the work, and means for moving the heel and side brushes out of contact with the work at certain periods in the reciprocation of the carriage.

2. In a shoe polishing machine, the combination of a longitudinally reciprocatory carriage, a motor and interposed operating mechanism, a set of rotary brushes movably mounted upon vertical axes upon said carriage, gearing between said brushes and said motor, and means for automatically moving said brushes transversely with reference to the work at a certain period in the reciprocation of the carriage.

3. In a shoe polishing machine, the combination with a reciprocatory carriage, a motor and interposed operating mechanism, a toe-polishing brush, a pair of side brushes and a pair of heel-brushes, gearing for continuously rotating said brushes during movement of the carriage, means for moving the heel-brushes toward each other and means for moving the toe-polishing brush vertically as the carriage moves to its rearward position.

4. In a shoe polishing machine, the combination of a frame, a foot rest mounted thereon, a reciprocatory carriage mounted on the frame, swinging yokes on the carriage, brushes on the yokes, and cooperating means on the yokes and frame for moving the brushes into and out of engagement with the work at each reciprocation of the carriage, a rotatable polishing brush movably mounted on the carriage and yieldingly held against the work, and means for moving the polishing brush out of engagement with the work during different reciprocations of the carriage.

5. In a shoe polishing machine, the combination of a frame, a foot rest mounted thereon, a reciprocatory carriage mounted on the frame, a pair of heel-brushes movably mounted thereon, springs connected to the heel-brushes and arranged to cause them to move toward said foot rest, abutments at the rear end of the frame, and rods connected with said brushes and arranged to

engage with said abutments to move the heel-brushes away from the foot rest, as the carriage moves rearwardly.

6. In a shoe polishing machine, the combination of a foot rest, a brush carriage movable toward and away therefrom, heel, side and toe-polishing brushes mounted on the carriage, the toe-polishing brush being normally held in work engaging position, mechanism for reciprocating the carriage, means operatively connected with the carriage reciprocating mechanism for raising the toe polishing brush out of work engaging positions and means operative upon movement of the carriage for moving the side and heel brushes laterally toward and away from the foot rest.

7. In a shoe polishing machine, the combination of a frame, a foot rest mounted thereon, a reciprocatory brush carriage mounted on the frame, a double armed yoke frame on the carriage a rotatable brush rotatably mounted in the arms of the yoke, a roller mounted on the yoke to move with the brush and guiding means on the frame for engaging with the roller to move the brush from the foot rest.

8. In a shoe polishing machine, the combination with a frame, a foot rest, a reciprocatory brush carriage mounted on the frame, and self adjusting side brushes slidably mounted upon vertical axes thereon.

9. In a shoe polishing machine, the combination of a frame, a foot-rest, a longitudinally reciprocatory carriage mounted on a frame, swinging brush yokes mounted on vertical axes on the carriage, rotatable brushes mounted for rotation upon vertical axes in the yokes and arranged to loosely slide vertically thereon, and means for swinging the yokes laterally toward and from the foot-rest at a certain point in the movement of the carriage.

10. In a shoe polishing machine, the combination of a foot rest, a brush carriage movable toward and away therefrom, a brush mounted thereon, a movably mounted toe hook and means for supporting the toe hook in front of the foot rest while the carriage is positioned away from the latter.

11. In a shoe polishing machine, the combination of a foot rest, a brush carriage movable toward and away therefrom, a polishing brush mounted thereon, a toe hook pivotally mounted on the foot rest and means for projecting the toe hook above the level of the foot rest as the carriage moves away therefrom.

12. In a shoe polishing machine, the combination of a foot rest, a brush carriage movable toward and away therefrom, brushes mounted thereon, a toe hook pivotally mounted on the foot rest and a lug mounted on the carriage to engage the toe hook.

13. In a shoe polishing machine, the com-

combination of a frame, a foot rest, a reciprocating carriage mounted to move toward and away from the foot rest, a toe-polishing brush mounted upon the carriage on a vertical axis, common means for reciprocating the carriage and for rotating the brush and a rotatable cam for adjustably supporting the toe-polishing brush in and out of work engaging position during the movement of the carriage.

14. In a shoe polishing machine, the combination of a frame, a foot rest, a carriage mounted to move toward and away from the foot rest, a toe-polishing brush mounted

in the carriage upon a vertical axis, common means for reciprocating the carriage and for rotating the brush, a rotatable cam for adjustably supporting the toe-polishing brush in or out of work engaging position, a ratchet connected to the cam and means on the frame for rotating the ratchet wheel upon movement of the carriage.

In testimony whereof, I have hereunto set my hand.

ROBERT R. McELHANY

Witnesses:

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MARY E. CAHOON.