May 6, 1924.

1,493,162

M. RINGSTROM ET AL

SHOE POLISHING MACHINE

Filed March 29, 1920 5 Sheets-Sheet 1

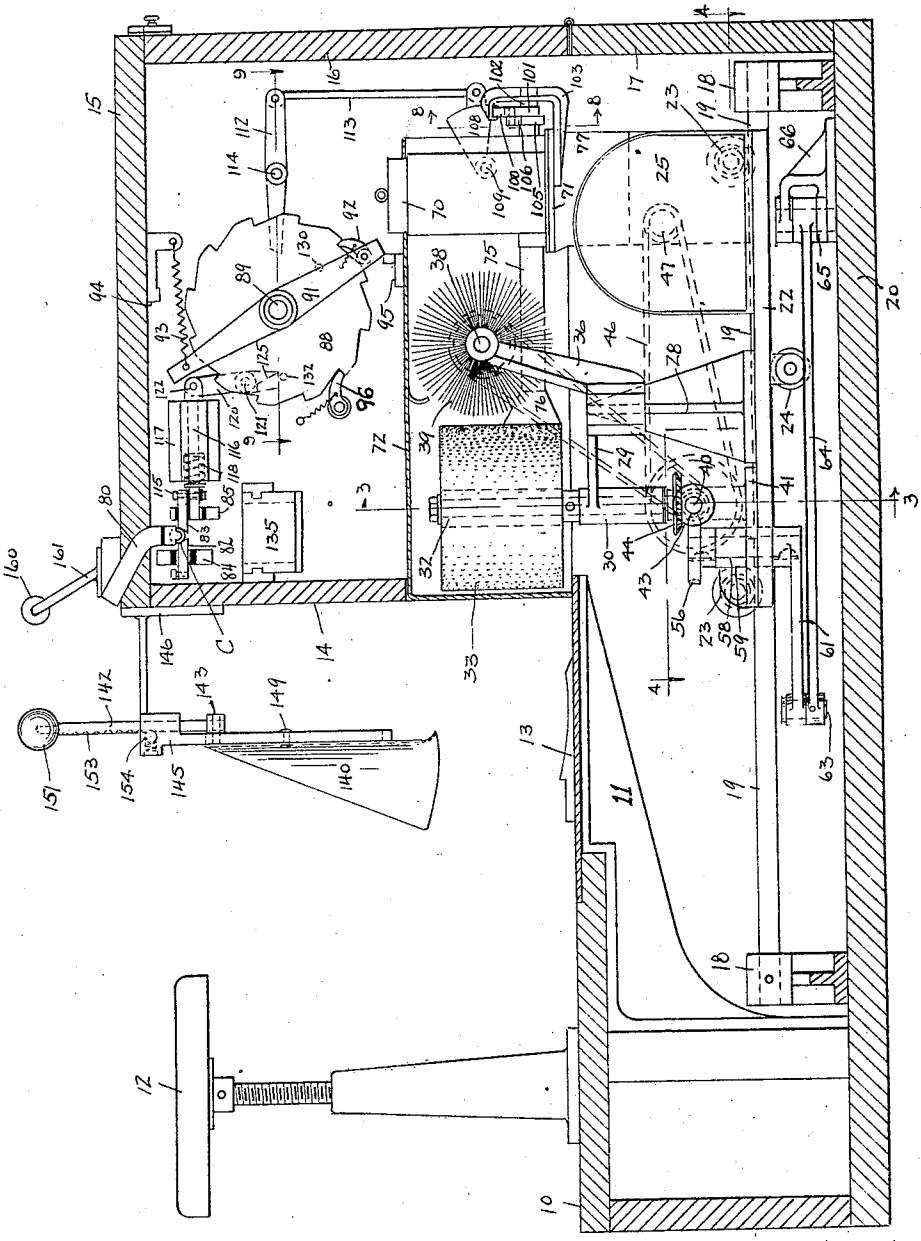


Fig 1.

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SHOE POLISHING MACHINE

Filed March 29, 1920 5 Sheets-Sheet 2

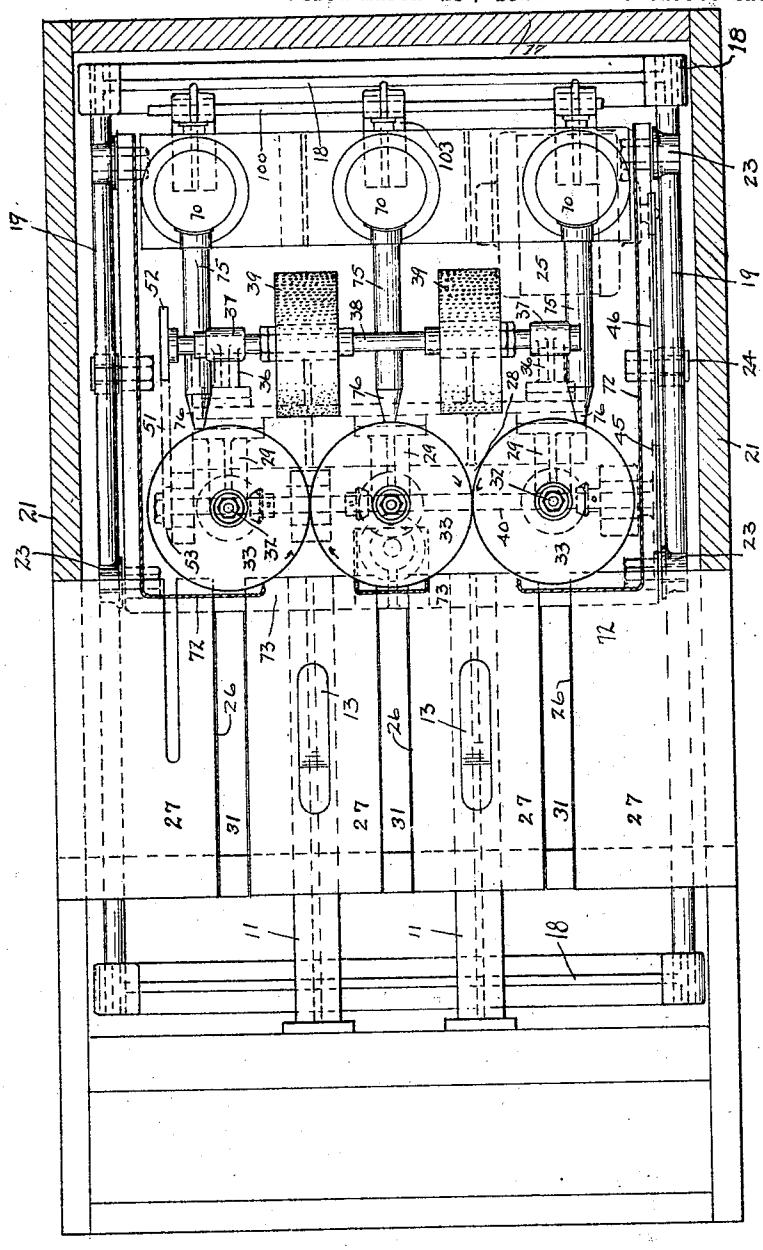


Fig. 2

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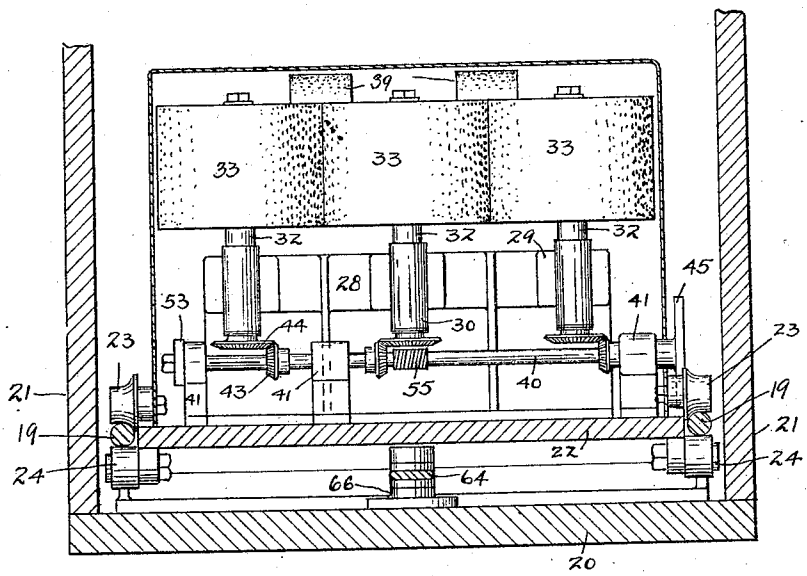
May 6, 1924. **1,493,162**

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SHOE POLISHING MACHINE

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Fig. 3



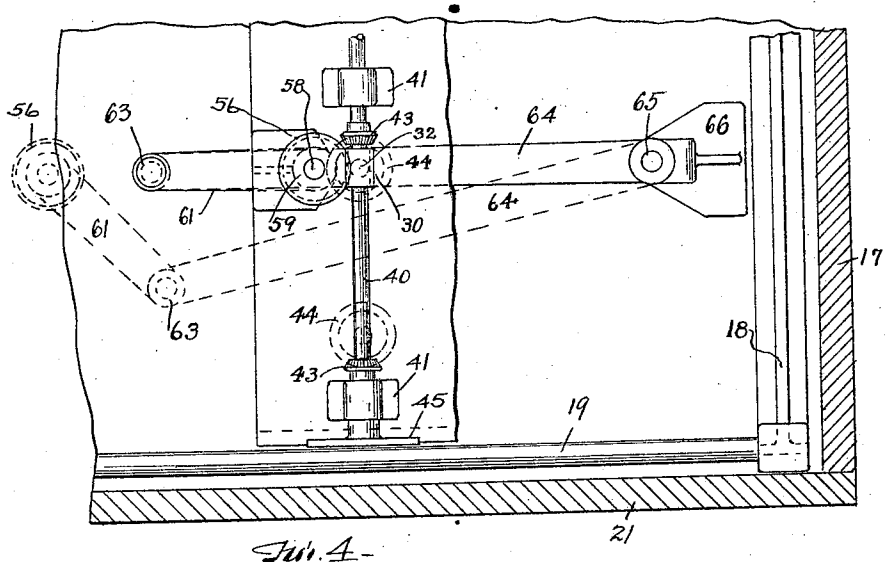


Fig. 4.

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May 6, 1924. **1,493,162**

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SHOE POLISHING MACHINE

Filed March 29, 1920 5 Sheets-Sheet 4

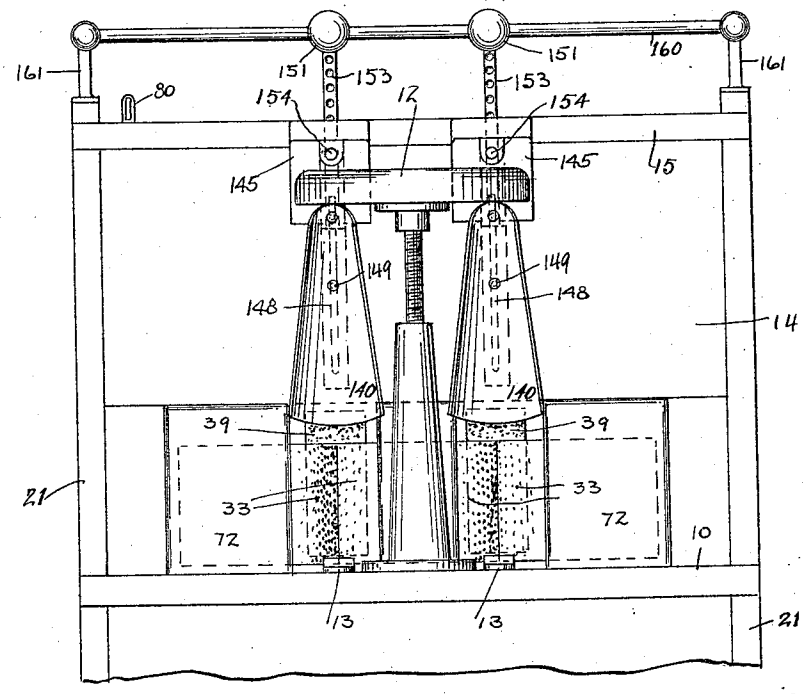


Fig. 5

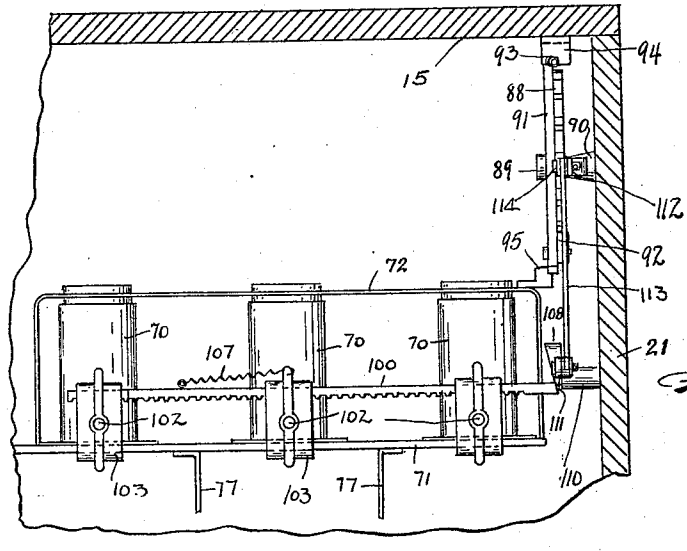


Fig. 6.

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M. RINGSTROM ET AL

SHOE POLISHING MACHINE

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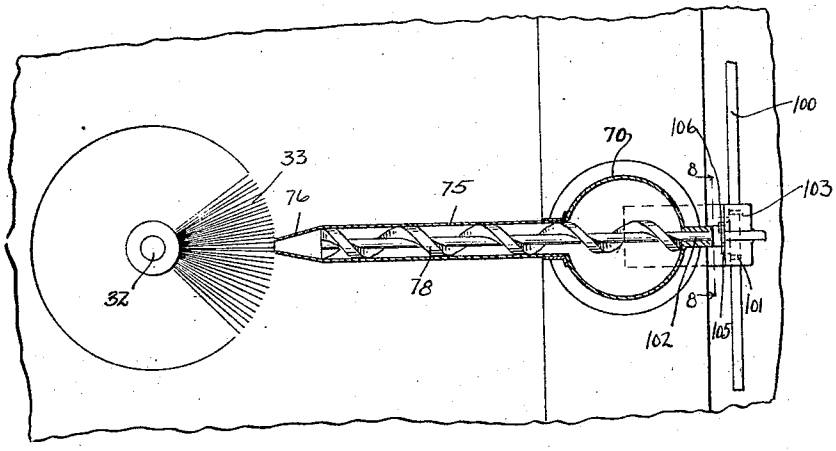


Fig. 7

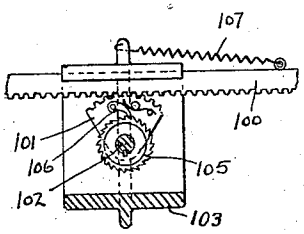


Fig. 8

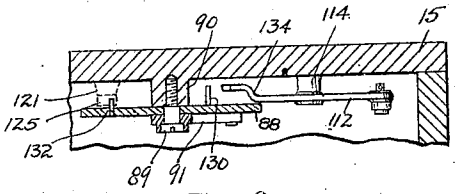


Fig. 9

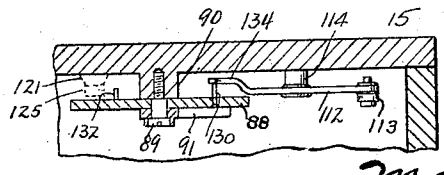


Fig. 10

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Patented May 6, 1924. 1,493,162

UNITED STATES PATENT OFFICE.

MAGNUS RINGSTROM AND CLIFFORD A. HARRIS, OF BRYAN, TEXAS, ASSIGNORS, BY MESNE ASSIGNMENTS, TO THE AUTOMATIC ELECTRIC SHOE POLISHING MACHINE COMPANY, OF BRYAN, TEXAS, A CORPORATION OF TEXAS.

SHOE-POLISHING MACHINE.

Application filed March 29, 1920. Serial No. 369,660.

To all whom it may concern:

Be it known that we, MAGNUS RINGSTROM and CLIFFORD A. HARRIS, citizens of the United States, residing at Bryan, in the county of Brazos and State of Texas, have invented a certain new and useful Improvement in Shoe-Polishing Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to apparatus for cleaning and polishing shoes, and the object is the provision of simple and efficient mechanism adapted to be operated under the control of a coin and constructed in such manner that a thorough "shine" may be had very quickly. More specifically our invention is concerned with mechanism having brushes adapted to be rotated and reciprocated over the surface of shoes worn by a customer seated at the machine, and of means for automatically applying paste or polish.

Among the features of our invention, we provide a controlling mechanism whereby rotating brushes are caused to bodily reciprocate over the shoes to clean them and remove dust before paste is applied, and thereafter to polish and shine them efficiently. The mechanism for automatically feeding the polish from its receptacle to the brush is an additional feature. Still another feature is the provision of adjustable guards to protect the clothing against soiling or contact with the brushes.

In the preferred embodiment of the invention the power mechanism comprises an electric motor, the circuit of which is closed by the insertion of a coin of proper value, causing the operation of the brushes and polish feeding mechanism under the control of stop mechanism designed to break the circuit and stop the operation after a predetermined time.

A preferred embodiment of our invention is illustrated in the drawings, wherein Fig. 1 is a vertical section through the machine showing the mechanism in side elevation; Fig. 2 is a plan of the lower portion of the apparatus showing the brush operating and polish feeding mechanisms; Fig. 3 is a vertical transverse section on the line 3—3 of Fig. 1; Fig. 4 is a horizontal section on the line 4—4 of Fig. 1; Fig. 5 is a front elevation of the machine; Fig. 6 is a vertical section showing the polish feeding means in rear elevation; Fig. 7 is an enlarged horizontal section through the polish feeding mechanism; Fig. 8 is a detail in the nature of a section on the line 8—8 of Fig. 7 showing means for actuating the polish feed screws; and Figs. 9 and 10 are horizontal sections through the controlling stop mechanism taken in different positions substantially on the line 9—9 of Fig. 1.

We have shown the apparatus constituting our invention housed in a suitable casing 10 provided at its forward end with a stool 12 on which the person desiring a "shine" may seat himself, and with supports 13 on which he may rest his feet, on rearwardly extending brackets 11. The rear end of the housing includes an elevated portion 15 adapted to house the operating and controlling mechanisms, there being a depending front wall 14 and a rear wall 17 having a hinged latched door 16. Near the base of the machine 20 we mount on suitable bracket supports 18, the rails 19 extending longitudinally along the sides 21 of the casing and constituting a trackway over which a carriage 22 may travel, being supported thereon as by the flanged wheels 23 and 24. We have shown wheels 23 at each of the four corners of the carriage 22 adapted to travel above the rails 19, and intermediate wheels 24 below the rails.

On the carriage 22 we mount a driving motor, and a plurality of cleaning and polishing brushes, and paste or polish receptacles and applying mechanisms. The motor is shown at 25 preferably located at one of the rear corners of the carriage 22 and may be of any desired size and type suitable to drive the mechanism disclosed. Across the forward portion of the carriage, we mount a flanged supporting web or bracket 28 having forwardly projecting arms 29 provided with bearing sleeves 30 adapted to support the vertical shafts 32 of three cylindrical brushes 33, arranged side by side. Projecting upwardly and rearwardly from the web 28 we provide arms 36 terminating in bearings 37 in which is supported a horizontal shaft 38 carrying two cylindrical brushes 39.

The brushes 33 are so arranged that their peripheries substantially contact directly at

the rear of the shoe rests 13 so that when the carriage 22 is moved forwardly the middle brush will pass between the shoes to engage the inside surfaces and the side brushes will engage the outside surfaces. The brushes 39 are arranged slightly above the brushes 33 and are spaced to engage the upper surface of the shoes. As shown in Fig. 2 the floor above the brackets 11 comprises portions 27 spaced as at 26 to permit the forward movement of the brush shafts 32 with the carriage 22, the spaces 26 being occupied by strips 31, which are connected as desired to the carriage 22, and braced and supported in any suitable manner to permit their sliding back and forth flush with the floor portions 27, thus providing a smooth continuous floor surface when the carriage is in its rearward position.

Across the rear of the carriage 22 we provide a row of paste or polish containers 70 on a shelf supported above the base of the carriage 22 by braces 77. Projecting forwardly from the bottom portion of each container 70 there is a tube 75 having preferably a narrow vertically elongated opening 76 adapted to contact with the lower portion of the periphery of the brushes 33. Within each tube 75 there is mounted a screw or helical member 78 which extends through the lower portion of the corresponding container 70 with the shaft thereon projecting rearwardly and carrying means hereinafter described whereby it may be rotated.

The brushes and paste containers and actuating mechanism therefor on the carriage 22 are preferably housed within a sheet metal casing 72 extending around the sides and over the top of the carriage mechanism and across the front of the brushes 33, openings 73 being provided opposite the foot supports 13 to permit forward movement of the carriage.

In front of the web 28 we support a horizontal lay shaft 40 in brackets 41. Gearing, preferably bevel pinions 43 and 44, is arranged on the shaft 40 and the vertical brush shafts 32 whereby the latter may be driven from the former, the center brush preferably rotating in the opposite direction from the other two, so that there is no tendency of one brush to remove polish from its neighbor. A suitable pulley or sprocket wheel 45 is secured at one end of the lay shaft 40 and connected by an endless belt or chain 46 with a similar member 47 on the armature shaft of the motor. Another endless chain or belt 51 connects the shafts 38 and 40 by passing over wheels 52 and 53 respectively on these shafts.

We provide mechanism for shifting the carriage back and forth on the track rails 19, preferably driving this mechanism through the lay shaft 40. Intermediate of the ends of the shaft 40, and preferably centrally located thereon is a rigid worm 55 adapted to mesh constantly with a worm wheel 56 secured to a vertical shaft 58 rotatably supported within a bearing sleeve 59 extending downwardly through the base of the carriage 22. Rigidly secured to the lower end of the shaft 58 is an arm 61. The other end of this arm is pivoted as at 63 to one end of a link 64, the opposite end of which is supported on a fixed pivot 65 in a bracket 66 near the rear of the casing. In view of the constant connection between the worm and worm wheel, rotation of these parts will cause the arm 61 to rotate about the axis of the worm wheel while the pivot 63 oscillates laterally with the link 64. As the carriage 22, carrying the worm wheel is guided by the rails 19 to move in a forward and rearward direction only, it follows that the carriage is so reciprocated, thus causing the brushes 33 and 39 to travel back and forth around and over the surface of the shoes on the supports 13.

The controlling means for the apparatus as shown comprises a ratchet wheel 88 supported on an inner wall of the casing 15 as on a screw 89 engaging a stud 90. Pivoted on the screw 89 is a lever 91 carrying at one end a spring-pressed pawl 92 adapted to engage the ratchet wheel 88. The other end of the lever is spring-pressed as at 93 toward a fixed stop 94. The ratchet wheel is actuated a distance of one tooth during each rearward movement of the carriage 22 by reason of a lug 95 on the casing 72 engaging the lever 91, a detent 96 preventing retrograde movement. The ratchet wheel 88 carries means for actuating the paste applying mechanism after the carriage 22 has made a desired number of reciprocations, and has additional means for causing the machine to stop after the polishing operation has been completed.

The means shown for actuating the paste feed screws 78 comprises a rack bar 100 extending transversely of the casing in the rear of the polish receptacles 70 and supported on toothed segments 101 loosely mounted on the rearwardly extending ends 102 of the screw shafts 78. The shaft ends 102 are supported each in a bracket 103 secured to the shelf 71 carrying the containers 70. Rigidly secured to each shaft 102 is a ratchet wheel 105 engaged by a pawl 106 carried by the segment 101. The end of the rack bar 100 is adapted to be engaged and moved against the influence of a return spring 107, by a wedge cam 108 pivoted as at 109 in a stud 110 in the side of the casing. The cam 108 is provided with an ear 111 whereby it may be connected through the link 113 to a rock lever 112 pivoted to the casing at 114, the lever 112 being adapted to be engaged during the course of the

actuation of the ratchet wheel 88, in a manner hereinafter described.

It is desired to operate the machine under the control of a coin. Accordingly, we have shown a coin chute 80 having an opening adapted to receive coins of the proper denomination and leading to a suitable circuit make-and-break device. A suitable coin detector may be provided if desired, to prevent the use of spurious coins, but such has not been illustrated as it constitutes no part of our invention. The coin chute 80 extends through the wall of the casing and terminates above a pair of insulated contact members 82 and 83, which form terminals of the controlling circuit not shown for the motor. The member 82 is fixed in a bracket 84 and the member 83 is axially slidable toward and away from the member 82 in a bracket 85.

The contact member 83 is shown insulated from and secured as at 115 to a plunger 116 slidable within a bracket 117 and urged toward the position shown in Fig. 1 by a spring 118, thus bringing the contacts 82 and 83 into a position preventing the passage of a coin between them. A rock lever 120 pivoted at 121 to the side of the casing has one end pivoted at 122 to the plunger 116 with the other end extending adjacent to the ratchet wheel 88 and provided with a cam 125, adapted to be engaged by means on the ratchet wheel to release the coin C when the polishing operation is completed. A suitable receptacle 135 may be supported beneath the contact members 82 and 83 to receive the coin.

The means shown on the ratchet 88 for engaging the rock levers 112 and 120 to control the polish feeding and the stopping of the machine, respectively, comprise the pins 130 and 132. The lever 112 preferably projects inwardly toward the center of the ratchet wheel 88 farther than does the lever 120. The pin 130 is positioned closer to the center of the ratchet wheel than the pin 132 and is made longer than the pin 132 whereby it may engage the bent end 134 of the lever 112 while the shorter pin 132 clears such bent end. The pin 132 however, is adapted to engage the cam 125 on the end of the lever 120 which member is not engaged by the pin 130 on account of its location.

To protect the clothing of the customer we support shields 140 depending from the casing adjacent to the shoe plates 13. The shields 140 comprise curved members secured to slide bars 142 as at 143 and may be adjusted vertically for different heights of shoes, within brackets 145 secured at 146 to the wall of the casing. The brackets 145 are slotted as at 148 through which a pin or rivet 143 and a guiding pin 149 may extend. The slide bars 142 are provided at their upper ends with knobs 151 and may have a row of notches 153 along one side adapted to be engaged by a spring-pressed ball 154 to hold the slide bars at desired adjusted position. A hand rail 160 may be mounted above the top of the casing 15 on supports 161.

The use and operation of the machine may be briefly described as follows:

A customer seats himself, with his shoes resting on the supports 13, adjusts the protecting shields 140, and inserts a coin C of the proper denomination in the coin chute 80. This coin bridges the gap between the contacts 82 and 83 thereby closing the circuit of the motor 25 which, through the medium of the flexible members 46 and 51, drives the shafts 38 and 40 rotating the brushes thereon, and through the worm 55, worm wheel 56, arm 61 and link 64 causes the carriage 22 to reciprocate on the rails 19 thereby moving the brushes 38 and 33 back and forth over and around the shoes on the supports 13. Near the end of each rearward movement of the carriage 22 the lug 95 on the top of the casing 72 engages the lever 91 and actuates the ratchet wheel 88 the extent of one tooth. After a predetermined number of reciprocations of the carriage 22, which will cause the shoes to be cleaned, the pin 130 engages the end of the rock lever 112 and cams the same upwardly, thereby moving the cam 108 downwardly, as shown in Figs. 2 and 6, which moves the rack bar 100 and rotates the paste feed screws 78 through a partial revolution by engagement of the pawls 106 on the ratchets 105, thereby causing the application of paste to the brushes 33 through the nozzles 76. As the reciprocation of the carrier continues the pin 130 passes out of engagement with the lever 112.

The pin 130 advances with the ratchet wheel past the cam 125 which it does not engage by reason of its radial position. The pin 132, which is short enough to pass freely across the bent end 134 of the lever 112, finally reaches the cam 125 and actuates the same to move the plunger 116 to the right as shown in Fig. 2 to release the coin C into the receptacle 135, thereby breaking the circuit and stopping the operation of the machine. The spring 118 retracts the plunger and contact 83 into position to arrest the coin for the succeeding operation.

We claim:

1. In a shoe polishing machine, the combination with an upright casing having an aperture therein, of a platform in front of the casing, exposed shoe rests on top of the platform and in front of the upright casing, a reciprocating carriage normally positioned within the casing, brushes rotatably mounted on the carriage, and means for moving the carriage through said aperture and past said rests.

2. In a shoe polishing machine, the combination with an upright casing having an opening in the front wall thereof, a platform in front of the casing and below said opening, a carriage within the casing, brushes mounted on the upright ends of vertical shafts which are mounted on the carriage and means for rotating the brushes and simultaneously reciprocating the carriage, open ended slots in the platform in registration with the brush shafts and shoe rests on the platform between said slots, said brushes extending above the plane of the rests so that when the carriage is reciprocated, the brushes pass through said opening and past said rests.

3. In a shoe polishing machine, a shoe support, a reciprocating carriage, a brush and paste feeding mechanism, and an index wheel controlled by the reciprocation of the carriage for effecting the operation of the paste feeding mechanism, said wheel being also employed for stopping the operation of the machine.

4. In a shoe polishing machine, a shoe support, a reciprocating carriage, a brush and paste feeding mechanism on the carriage, and means controlled by the reciprocation of the carriage for effecting the operation of the paste feeding mechanism, said means being also employed for subsequently stopping the movement of the carriage.

5. A shoe polishing machine having in combination a reciprocating carriage, a standard carried thereby, said standard having laterally extending arms and upwardly extending arms, a substantially vertical shaft in each of the lateral arms, and a substantially horizontal shaft supported in the upwardly extending arms, brushes on each of the shafts, a lay shaft rotatably connected to the other shafts, and means for rotating the lay shaft.

6. A shoe polishing machine having in combination, a reciprocating carriage, means for reciprocating the carriage, brushes mounted on the carriage, a lay shaft rotatably connected with each brush, a vertical shaft extending through the carriage, a worm wheel connection between said shafts, and means associated with the worm wheel connection for reciprocating the carriage.

7. A shoe polishing machine, having in combination a reciprocating carriage, rotatable brushes mounted thereon, a shaft extending vertically through the carriage, an arm beneath the carriage and rigid with said shaft, and means associated with the shaft for transforming rotary motion of the arm into reciprocating motion of the carriage.

8. A shoe polishing machine having in combination a reciprocating carriage, brushes carried thereby, paste-applying means mounted on the carriage adjacent the brushes, a single index wheel arranged to be advanced step by step by reciprocating movement of the carriage, pins projecting laterally from one face of the wheel, one of said pins being arranged to actuate the paste-feeding mechanism and the other of said pins to stop the carriage.

9. A shoe polishing machine comprising rotating brushes, a reciprocating brush carriage, a motor mounted on the carriage for rotating said brushes, a crank member extending through the carriage and rotatably connected with the motor, and an oscillating link having the free end thereof connected with said crank member, whereby the carriage is caused to be reciprocated whenever said member is rotated.

10. A shoe polishing machine comprising in combination, a frame, a reciprocating carriage mounted thereon, brushes carried by the carriage, a member extending through the carriage and rotatably connected with said brushes, an arm beneath the carriage and rigid with said member, an oscillating link having the free end thereof pivotally connected to said arm whereby rotation of said member causes reciprocation of the carriage.

11. In a shoe polishing machine, a brush operating mechanism, a paste feeding mechanism, and a single index wheel for starting and stopping the operation of both mechanisms at different times.

12. In a shoe polishing machine, a rotating and reciprocating brush mechanism, a paste feeding mechanism actuated after the brush operating mechanism has been in operation a predetermined period, a master index wheel and means operated by said wheel for stopping the operation of both mechanisms at different subsequent periods.

13. In a shoe polishing machine, a casing, a pair of shoe supports thereon, a longitudinal trackway extending beneath and parallel to the shoe supports, a carriage reciprocable over the trackway, a plurality of brushes on the carriage, a driven shaft connected with the brushes for rotating the same, an arm rotatably connected to the shaft and having a bearing in the carriage, an oscillating link having its free end pivoted to the arm, whereby the carriage is caused to reciprocate over the trackway, when the shaft is rotated.

14. In a shoe polishing machine, a longitudinal trackway, a carriage reciprocable over the trackway, a motor and a plurality of brushes on said carriage, a shaft driven by the motor and connected with the brushes for rotating the same, and means including an arm rotatably connected to the shaft and to an oscillating link, whereby the carriage is caused to reciprocate over the trackway.

15. In a shoe polishing machine, a reciprocating carriage, a plurality of aligned

vertical bearings on said carriage, a shaft in each bearing, and a brush on each shaft, a horizontal shaft parallel to and behind said row of vertical shafts, a lay shaft rotatably connected with the other shafts, and means for rotating the lay shaft.

16. In a shoe polishing machine, a standard, a plurality of brushes arranged in a transverse row on said standard, a horizontal shaft having a plurality of brushes spaced thereon in staggered relation with the first named brushes, a horizontal lay shaft connected to said brushes, and means for rotating the lay shaft.

17. In a shoe polishing machine, a trackway, a carriage, a supporting web thereon, a plurality of brushes supported therefrom on vertical shafts, a plurality of brushes supported therefrom on a horizontal shaft, a lay shaft, means connecting the same with said brush shafts, a worm forming a part of said shaft, a worm wheel engaging said worm, an arm secured at one end to said worm wheel, a link mounted at one end on a fixed pivot and its opposite end pivoted to the free end of the arm, and means for rotating said lay shaft.

18. In a shoe polishing machine, a carriage, paste-feeding mechanism thereon, means for actuating the carriage, a ratchet wheel operated step by step by the reciprocation of said carriage, a pin on said wheel for actuating the paste-feeding mechanism, and a second pin carried by said wheel for stopping the carriage.

19. In a shoe polishing machine, a carriage, paste-feeding mechanism thereon, means for actuating the carriage, a ratchet wheel operated step by step by the reciprocation of said carriage, two rock levers, a relatively long pin arranged on a relatively short radius on said wheel and adapted to engage one of said levers, after a predetermined movement of the ratchet wheel, for operating the paste-feeding mechanism and a relatively short pin arranged on a relatively long radius on the ratchet wheel, and adapted to engage the other of said levers, for stopping the carriage actuating means.

20. In a shoe polishing machine, a casing having a platform, a plurality of shoe supports above the platform, a plurality of rotatable brushes normally held within the casing but movable outside thereof and along said supports, and shields carried outside the casing and adjacent the supports.

21. In a shoe polishing machine, a trackway, a carriage, a supporting web thereon, a plurality of vertical bearings arranged in a row and extending from said web, a shaft having a brush carried in each bearing, a plurality of aligned longitudinal bearings extending from said web, a shaft carrying a plurality of brushes mounted therein, a lay-shaft, means for rotating said brush shafts from said lay-shaft, and means for rotating said lay-shaft.

22. In an automatic shoe polishing machine, in combination, a reciprocating carriage, a motor thereon, a shaft on said carriage rotated by said motor, a worm on said shaft, a worm wheel engaged therewith, a crank rotated by said worm wheel, an immovable bearing for said crank, a link connecting said crank with its bearing, substantially as and for the purposes described.

23. In an automatic shoe polishing machine, in combination, a fixed guiding frame, a reciprocating bridge thereon, a prime motor on said bridge, shoe polishing brushes on said bridge, a crank on said bridge rotated by said motor, a bearing on said frame, and a link anchoring said crank to said bearing.

In testimony whereof, we hereunto affix our signatures.

MAGNUS RINGSTROM.
CLIFFORD A. HARRIS.