Mar. 13, 1923. 1,448,342.

C. A. HARRIS.

SHOE POLISHING MACHINE.

FILED DEC. 7, 1920. 5 SHEETS—SHEET 1.

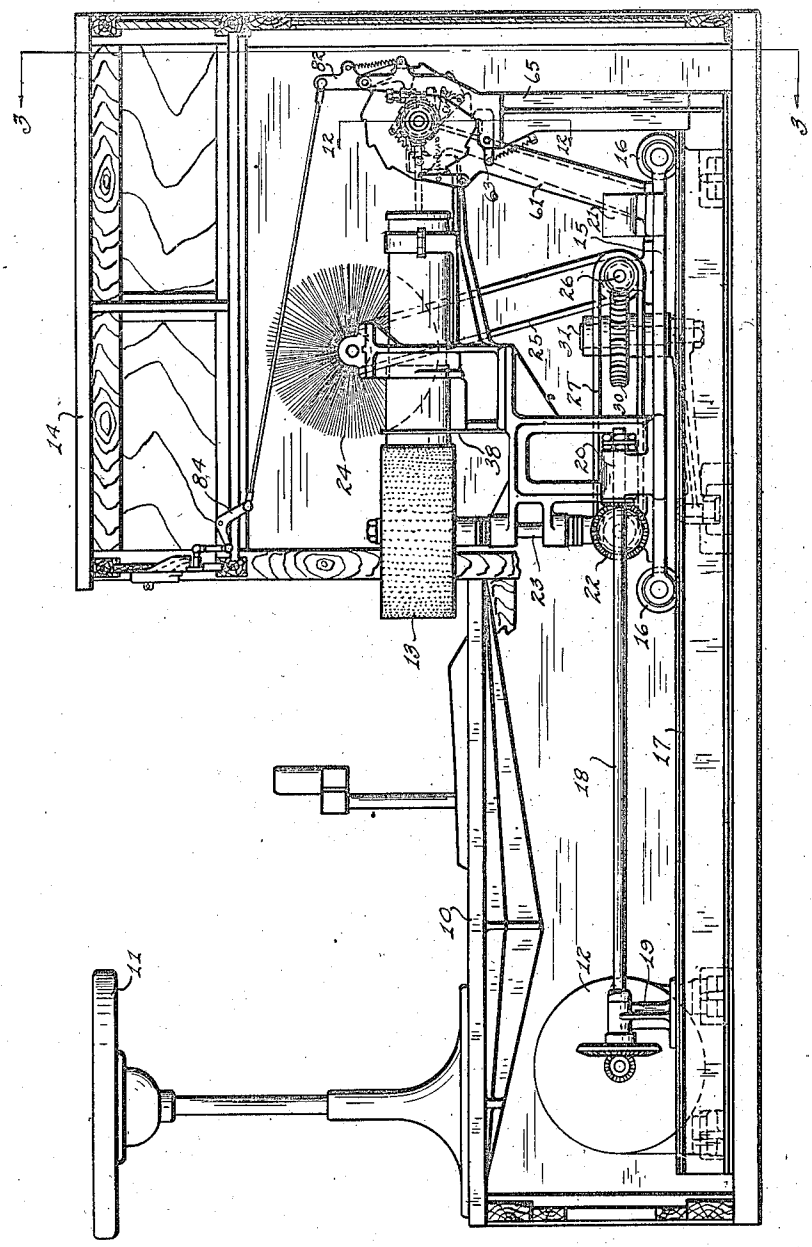


Fig. 1.

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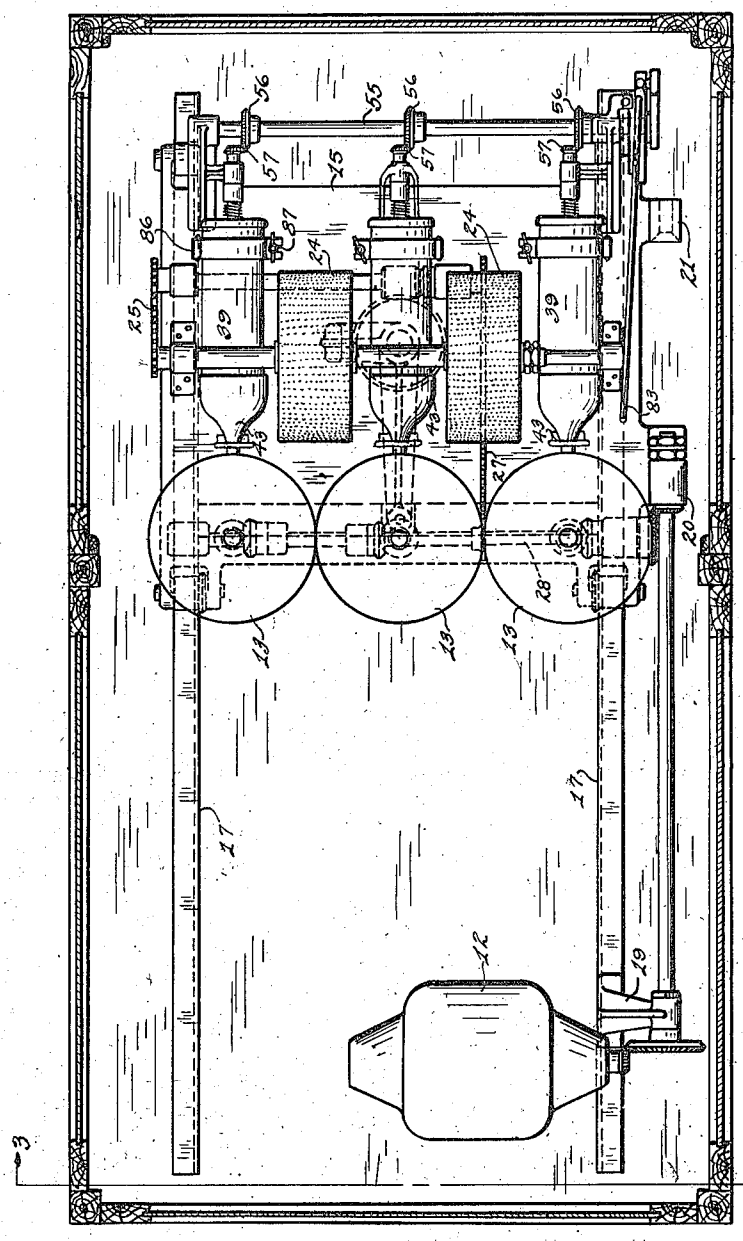


Fig. 2.

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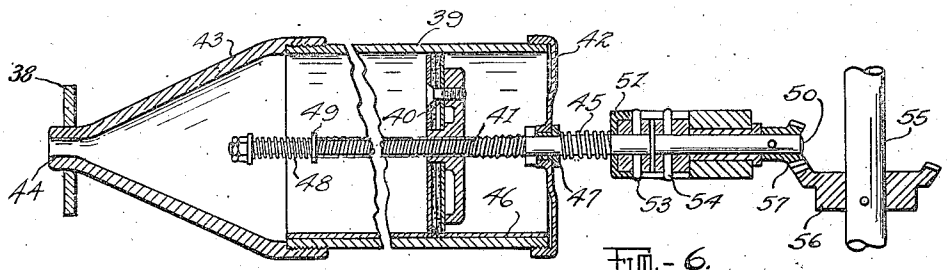


FIG. 6.

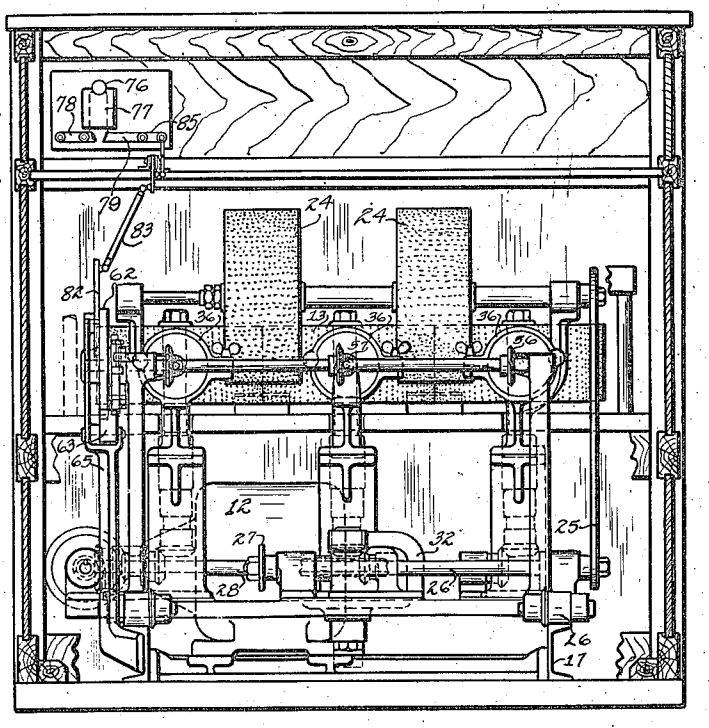


FIG. 3.

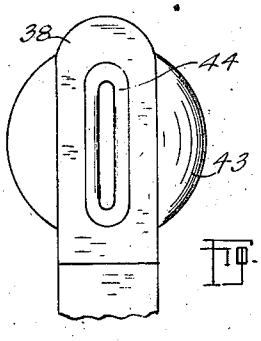


FIG. 7.

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SHOE POLISHING MACHINE.

FILED DEC. 7, 1920. 5 SHEETS—SHEET 4.

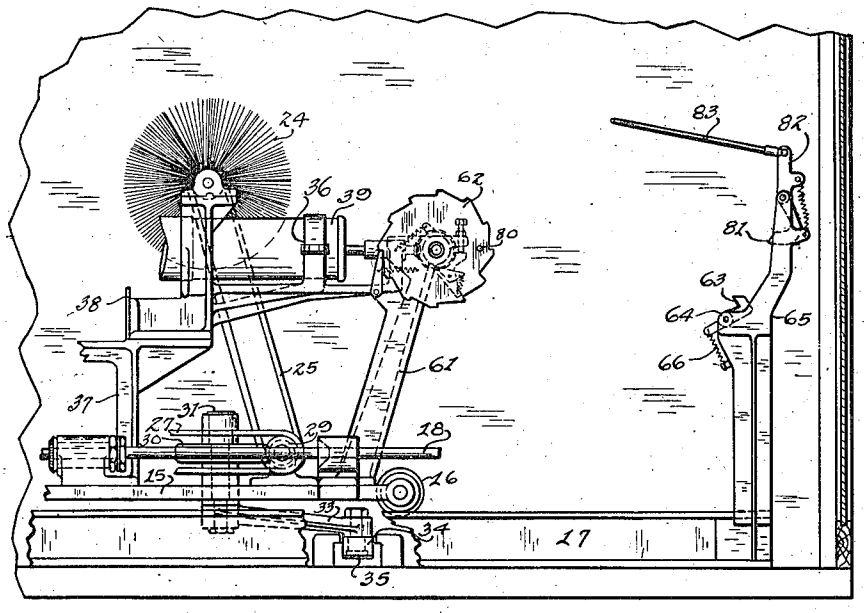


Fig. 4.

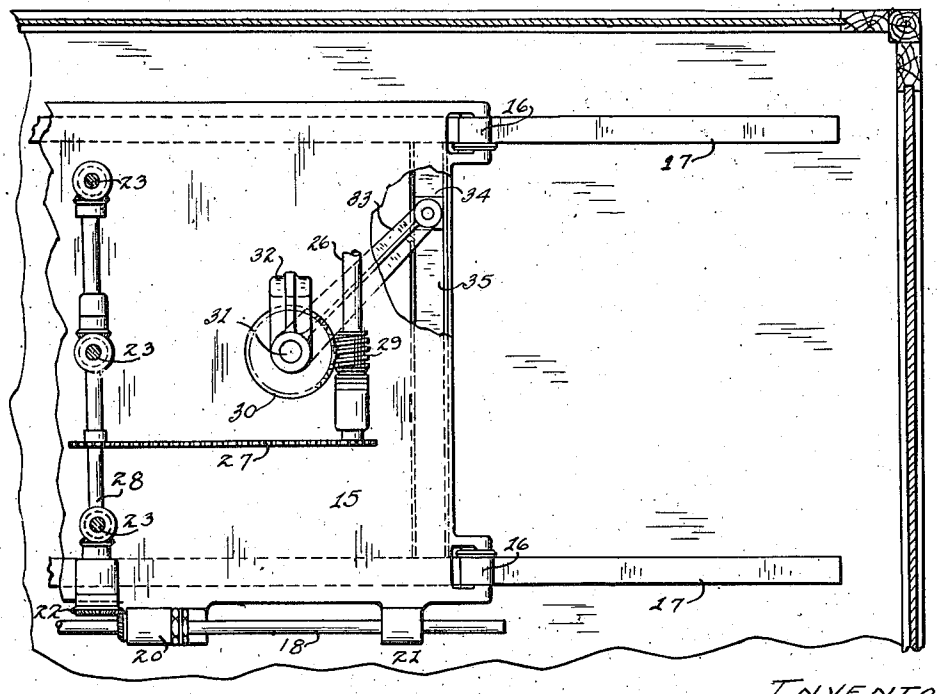


Fig. 5.

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SHOE POLISHING MACHINE.

FILED DEC. 7, 1920. 5 SHEETS—SHEET 5.

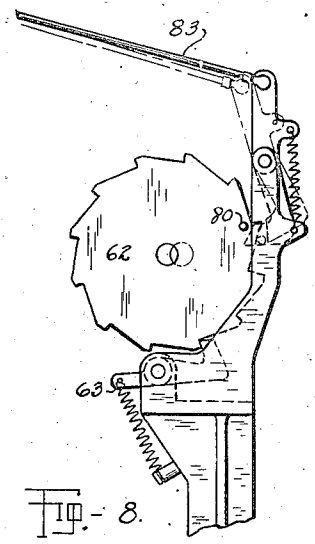


FIG. 8.

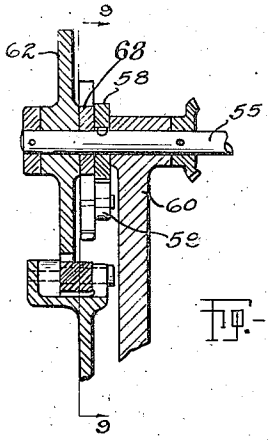


FIG. 12.

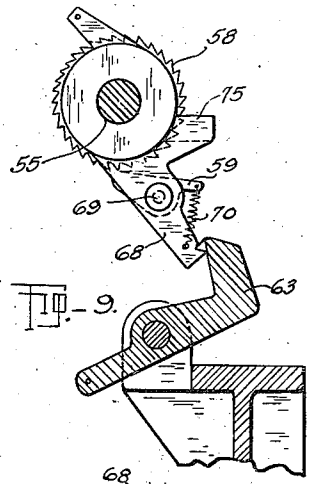


FIG. 9.

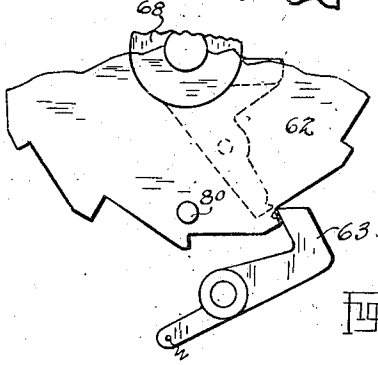


FIG. 10.

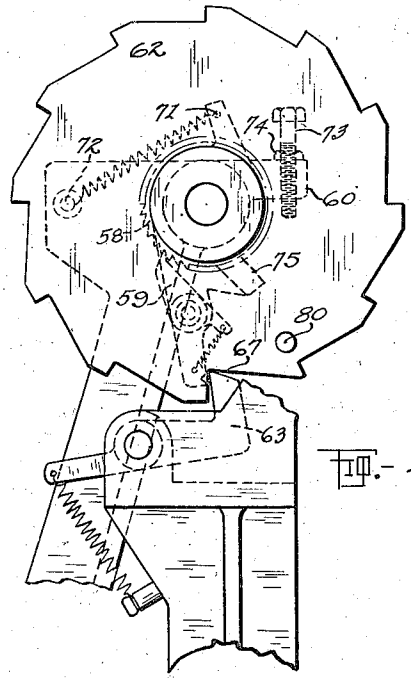


FIG. 11.

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Patented Mar. 13, 1923. 1,448,342

UNITED STATES PATENT OFFICE.

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

SHOE-POLISHING MACHINE.

Application filed December 7, 1920. Serial No. 428,991.

To all whom it may concern:

Be it known that I, CLIFFORD A. HARRIS, a citizen 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 is primarily concerned with a paste feeding mechanism adapted to be operated by a coin controlled means, which governs the operation of the cleaning and the polishing mechanism. My invention as relating to the novel paste feeding mechanism is well adapted for use in connection with such a polishing machine as shown and described in the copending application, by myself and Magnus Ringstrom, Serial No. 369,660, filed March 29, 1920, in which it may be substituted for the paste feeding means there shown.

In the operation of the paste feeding mechanism I have found that the consistency and character of the desired paste necessitates a positive pushing feed wherein pressure must be exerted against the mass of paste, to insure its ejection from the container. An object of the present invention is the provision of means for effecting such positive feed of the paste, irrespective of the consistency and degree of adhesiveness thereof.

Another object is the provision of simple and effective mechanism for causing the operation of the paste feeding means, which mechanism is adapted to be governed by a coin controlled mechanism.

In this machine the whole operation results automatically from the operation of an electric motor, the circuit of which is closed by the deposit of a coin, this motor reciprocating the brushes and paste feeding mechanism and the latter being actuated, consequent upon such reciprocation. The means for effecting the reciprocation and for terminating the operation are included within my invention.

The means for effecting the positive feeding, and for carrying out the other operations referred to, will be fully set forth in the following description, which relates to the drawings, and the essential novel characteristics thereof will be set forth in the claims.

In the drawings, Fig. 1 is an elevation in the nature of a section thru a polishing machine, embodying the features of my invention; Fig. 2 is a plan of the machine having the cover thereof removed; Fig. 3 is a section thru the machine taken on the line 3—3 in Fig. 1; Fig. 4 is a fragmentary view showing an elevation of the paste feeding mechanism; Fig. 5 is a plan of the mechanism, adapted for reciprocating the polishing brushes; Fig. 6 is a section of the paste container; Fig. 7 is an end view showing the method of supporting the orifice-end of the container; Figs. 8 to 12 are details of the ratchet feed mechanism, showing various positions of the paste operating member.

In the drawings, 10 represents a casing, containing a motor 12 for bodily reciprocating horizontal brushes 24, vertically disposed polishing brushes 13, and paste feeding mechanism associated with the latter, the brushes rotating during their reciprocation. The front of this casing supports a stool 11 for the customer, while at the rear is an elevated portion 14 adapted to house the operating and controlling mechanism. The brushes and paste carrier are suitably supported on a carriage 15, having wheels 16, which travel on a trackway 17.

The motor 12 is shown in Fig. 1 as connected thru suitable gearing to a shaft 18, which shaft may be supported at one end by a bracket 19 and at the other end by brackets 20, 21, carried by the carriage 15. I have shown beveled gearing 22, for transmitting rotary motion from the shaft 18 to the shaft 28 on the carriage. This latter shaft is suitably geared for rotating a vertical shaft 23 to operate the vertically disposed brushes 13. The horizontally disposed brushes 24 are adapted to be rotated thru a sprocket chain 25, connected with a sprocket wheel on a shaft 26, which in turn may be driven by a sprocket chain 27 from a shaft 28.

To reciprocate the carriage, I have shown in Fig. 5 a worm 29, mounted on the shaft 26, and engaging a worm wheel 30. This worm wheel is supported by a shaft 31 in a bracket 32, which bracket may constitute a

part of the carriage 15. Extending from the lower end of the shaft 31, I provide a crank arm 33, which is connected to a block 34, which block is adapted to slide in a guideway 35, in the base, and forms a "Scotch yoke" motion for reciprocating the carriage.

The paste feeding mechanism will now be described. This mechanism includes a paste container 39, mounted on the carriage 15. This container is shown as supported at one end by a clamping member 36, carried by a bracket 37, on which bracket the horizontally disposed brushes 24 are mounted. The other end of the paste feeding container is positioned by a stirrup 38, which may also be carried by the bracket 37. As the carriage is reciprocated, the paste feeding mechanism is therefore moved simultaneously therewith, so that the discharge end of the feeding mechanism is adjacent the vertical brushes onto which the paste is to be deposited.

The container 39, which is adapted to retain a mass of paste, is provided with a piston 40, which moves in the container and longitudinally thereof. A continuously threaded rod 41 extends thru the container and co-operates with the piston to move it within the container. Suitable mechanism for rotating the plunger rod, at periodic intervals, to eject a predetermined quantity of paste from the container, will be hereinafter described.

The container 39 preferably comprises a cylindrical member, equipped at one end with a removable cap 42, and provided at the other end thereof with a tapered orifice member 43. The tapered member 43 is adapted to extend from an aperture 44, in the stirrup 38, and to be held thereagainst by a spring 45, which bears against the cap 42.

By virtue of the close fitting engagement between the piston and the walls of the container, I provide a positive feed of the paste against the brushes 13. To prevent the plunger 40 from rotating within the container, I provide a guiding member or strip 46 secured to the inner surface of the container and occupying a groove in the piston. The piston rod 41 is supported at 47, by the cap 42, and is equipped at the extreme inner end thereof with a spring 48, and a collar 49. This spring serves as a yielding member against which the piston may abut whenever it reaches the end of the feeding stroke. That portion of the rod on which the yielding member is mounted is not threaded, and the piston may therefore ride onto that portion without endangering the threads on the rod, or causing jamming.

To enable the container to be removed from its support for refilling, and at the same time to permit the plunger rod to be effectively rotated, I provide, as shown in Fig. 6, an interengaging connection between the plunger rod and its operating shaft 50. This interengaging connection may comprise a sleeve 51, yieldingly mounted on the rod 41. This sleeve may be provided with one or more slots, which extend from the end 52 thereof and are of a size sufficient to permit the pins 53, 54, to be inserted therein. The pin 53 is rigidly connected with the rod 41, while the pin 54 is rigidly supported on the shaft 50, and consequently when the container is in operative position, the sleeve 51 is normally held in engagement with the pin 54, and a positive drive is therefore effected between the drive shaft and the plunger rod. The simple movement of the sleeve toward the container releases the connection.

In Fig. 2 a number of containers are shown in position upon the carriage 15, and the operating mechanism for each container is shown as constituting a shaft 55 on which are mounted the beveled gears 56, coacting with gears 57, mounted on the drive shafts 50. It will be understood, therefore, that each piston is simultaneously operated to eject a mass of paste against the respective brushes. To operate the shaft 55, I provide a ratchet wheel 58, as shown in Fig. 9, and I provide a pawl 59, which co-operates with the ratchet wheel to rotate the shaft 55, and thereby cause the feeding operation.

In Fig. 12 the feed ratchet wheel 58 is shown as rigidly connected with the shaft 55 and adjacent the bearing block 60. This bearing block may constitute the end of a standard 61, which projects upwardly from the carriage 15, and is, therefore, adapted to be reciprocated therewith. Adjacent the feed ratchet wheels, I provide another ratchet wheel, which will be designated the "master" wheel 62. This master wheel controls the feeding and stopping mechanism in a manner that will be now described.

To actuate the master ratchet wheel, I provide, as shown in Fig. 4, a pawl 63, pivoted at 64, to a bracket 65, which bracket may be rigidly secured to the casing 10. A spring 66 normally urges the tooth of the pawl 63 upwardly, and enables it to engage a tooth in the master wheel when the carriage is in its rearmost position. This rearmost position is shown in Fig. 1 and also in Figs. 8 to 11. Whenever the wheel is engaged by the pawl, it is advanced a distance of one tooth. One complete rotation of the wheel stops the operation of the motor, and therefore the number of the teeth determines the number of the reciprocations.

I have shown the master wheel having twelve teeth, one of which—as at 67, is cut deeper than the other teeth. When the pawl 63 drops into the tooth 67 then the nose of

this pawl is brought into a position to engage the lowermost portion of an arm 68. This arm is loosely mounted on the shaft 55 intermediate the ratchet wheels 58 and 62 and carries a pawl 59. This pawl is pivoted at 69 and is normally held against the feed ratchet wheel 58 by a spring 70. The upper end of the arm 68 may be attached to the end of a spring, as at 71, the other end of the spring being secured, as at 72, to the bearing block 60. The face of the pawl 63 possesses sufficient width to permit one side thereof to engage the notched end of the arm 68, whenever the nose of the pawl drops into the tooth 67. This causes a feeding of the paste on one stroke of the carriage.

When the pawl 63 is in contact with any of the teeth of the master ratchet except the deep tooth 67, it is adapted to clear the arm 68 and to cause only the master wheel to be advanced one notch. Such a condition is shown in Fig. 10, wherein the pawl is about to engage the master wheel and to advance it.

To regulate the flow of paste from the container, I provide adjusting mechanism comprising preferably an adjusting screw 73, supported in the bearing block 60 and equipped with a lock nut 74. The retaining spring, attached to the upper end of the arm 68, urges the portion 75 thereof, against the lower end of the adjusting screw, so that it is possible to regulate the number of teeth to be engaged by the pawl 59 by manipulation of the adjusting screw 73.

In operation, assuming that a coin 76 is inserted in a coin chute 77, then the circuit is completed between the contact points 78, 79, and the motor 12 is set in operation. Due to the mechanism heretofore described, the carriage 15 is caused to reciprocate on the trackway 17, and the master ratchet wheel 62 to engage, near the end of its rearward stroke, with the pawl 63, carried by the stationary member 65. A further rearward motion of the carriage causes the master wheel to be advanced one notch, and when the pawl engages the tooth 67, then the arm 68 is moved simultaneously with the wheel 62. Movement of the arm 68 causes the feed ratchet 58 to be rotated. The shaft 55 is rotated with the ratchet wheel 58, which motion is transmitted thru the gears 56, 57, to the plunger rod 41 to cause the piston to move inwardly within the container and thereby to eject a predetermined quantity of paste.

During the cycle of operation, above described, the coin 76 remains between the contact point 78, 79. To remove the coin from this position and to bring the operating mechanism to a stop, I provide a pin 80, which projects outwardly from one side of the wheel and is adapted to be engaged by the lowermost point 81 of a lever 82. The upper end of the lever 82 may be connected by a link 83 to a bell crank 84, as shown in Fig. 1, while the bell crank may be connected by suitable mechanism to a lever 85, on which the contact point 79 is mounted. This system of levers and links is so arranged, that rearward movement of the lower part of the arm 82, causes the lever 85, carrying the contact point 79, to be oscillated, whereby the coin 76 is dropped into a suitable receptacle, and the current is cut off from the motor 12, stopping the machine.

The pin 80 which determines the point of stopping and starting, is so positioned on the master wheel, that one or more reciprocating motions of the carriage must ensue before the paste feeding operation occurs. This provides for cleaning the shoes of a customer prior to the application of paste and subsequent polishing operations.

To refill the container 39, the operator unclamps the yoke 36, which yoke is constructed in two parts, one hinged upon the other, as at 86, and clamped preferably by a winged nut, as at 87. He then moves the sleeve 51 toward the container against tension of the spring 45 until it is disengaged from the pin 54 and the end 52 thereof clears the end of the shaft 50, thereupon the container may be tilted about the aperture 44 in the inner supporting bracket 38 and the entire container moved rearwardly and lifted from the machine. The cap 42 may then be removed and the filling operation quickly accomplished. The piston is then spun back on the threaded rod and re-inserted in the casing. The container is then inserted in the machine, whereupon the latter is ready for continued use.

From the foregoing description it will be seen that I have provided a paste feeding mechanism that is capable of operation irrespective of the consistency of paste to be applied; that I have provided a feeding mechanism which may be conveniently adjusted to regulate the quantity of paste to be ejected, and that my paste feeding mechanism is well adapted for use with a polishing mechanism having a carriage reciprocated under the control of a deposited coin.

Having thus described my invention, I claim:—

1. In a device of the character described, the combination with a brush, of a paste container, a paste ejecting member on the container, a ratchet wheel, and means for intermittently operating said member to eject paste from the container, said intermittent action being controlled by the depth of the notches on the ratchet wheel.

2. In a device of the character described, the combination with a reciprocating carriage, of a brush carried thereby, a paste

container on the carriage, the discharge end of the container being tapered and positioned adjacent the brush, a threaded member extending through the other end of the container, a follower on said member and within the container, means for rotating said threaded member to advance said follower, and separable interengaging means adjacent the threaded member for enabling the container to be manually disengaged and removed as a unit.

3. A paste feeding mechanism having in combination a container, having a cap at one end thereof and a tapered portion at the other end thereof, a bracket having an aperture adapted to receive said tapered portion, and means for locking the container in position.

4. A paste feeding mechanism having in combination a container, having a cap at one end thereof, and a tapered portion at the other end thereof, a bracket having an aperture adapted to receive said tapered portion, a hinged yoke adapted to embrace the container near the cap end thereof, and means for locking the yoke into clamping position.

5. The combination with a brush of a reciprocating carriage a paste container on the carriage, a member therein for ejecting paste, means adapted to operate said member, and separable interengaging means connecting the member with its operating means, whereby the container as a unit may be removed from the carriage.

6. A paste feeding mechanism having in combination a paste container, a member therein for ejecting paste, ratchet means adapted to operate said member, and slidable inter-engaging means connecting the member with the ratchet means.

7. In combination, a container for holding paste, a piston therein, said container having a cap at one end thereof, and a tapered portion at the other end thereof, a threaded member extending thru one end of the container and adapted to operate the piston, and yielding means for holding the piston in engagement with the member after it has been advanced beyond the threaded portion of said member.

8. In combination, a paste container, a member longitudinally movable therein, a rotary threaded member adapted to engage the longitudinally movable member, and yielding means carried by the rotary member in engagement with the threaded member after it has been advanced beyond the end of the threaded portion.

9. The combination with a brush of a paste container, movable means carried by the container for ejecting paste, a ratchet for operating said means, and a separable clutch intermediate the ratchet and the ejecting means, said clutch comprising a sliding pin and slot connection, whereby the container may be removed as a unit for refilling purposes.

10. In combination, a paste container, a follower therein, a ratchet having at least one notch thereof cut deeper than the other notches thereof, and means associated with the ratchet for advancing the follower to eject paste, said means being operable consequent upon the engagement of the ratchet with the deep-cut notch.

11. In combination means for holding paste, ratchet means for ejecting a quantity of paste therefrom, an operating device for said ratchet means, a ratchet wheel and an associated pawl, said ratchet wheel having at least one notch thereof cut deeper than the remaining notches, the engagement by the pawl with the deep cut notch bringing it into position to operate said operating device.

12. In combination, a reciprocating carriage, a paste container thereon, a longitudinally movable member within the container, a feed ratchet wheel on the carriage, said wheel having at least one notch thereof cut deeper than the other notches, a pawl, means for advancing the wheel step by step upon the reciprocation of the carriage, and means whereby contact of the pawl with the deep-cut notch actuates said longitudinally movable member.

13. In combination, a reciprocating carriage, a brush thereon, a container having a tapered discharge passageway adjacent the brush, a follower in the container, a ratchet wheel on the carriage, a member adapted to engage and operate the ratchet at the end of the reciprocating motion of the carriage, and means operatively connecting the ratchet wheel with the follower, said means being actuated by the depth of the notch on the ratchet wheel.

14. In a device of the character described, the combination with a paste container, of a follower therein, two ratchet wheels positioned side by side, a pawl having the face thereof extending across both of said wheels, an arm, means whereby the depth of the notch in one wheel causes the pawl to engage the arm, means whereby movement of said arm actuates the other of said wheels, and means operatively connecting the last mentioned wheel with said follower.

15. In a device of the character described, the combination with a reciprocating carriage, of a paste container thereon, a follower longitudinally movable within the container, two ratchet wheels, one of said wheels having at least one notch thereof cut deeper than the other of said notches, a pawl for advancing said wheel step by step upon the reciprocation of the carriage, an arm intermediate said wheels, said arm be-

ing adapted to be engaged by the pawl whenever contact is made with said deep cut notch, means whereby the movement of the arm rotates the other of said wheels, and means operatively connecting said last mentioned wheel with the follower.

16. In combination, means for containing paste, means for ejecting paste from the container, said ejecting means comprising a feed ratchet wheel, an arm having a notched portion and associated with said wheel, a master ratchet wheel having at least one notch thereof cut deeper than the other notches thereof, means for mounting said ratchet wheels and container on a reciprocating carriage, and a pawl carried by a stationary support for rotating said master ratchet wheel, said pawl having a projecting tooth adapted to engage the notched portion of said arm to shift the feed ratchet, whenever the pawl engages the deep cut notch on the master ratchet wheel.

17. A paste feeding mechanism having in combination a cylindrical container, a piston therein, a threaded operating piston rod for said piston, yielding means carried by said rod adjacent the inner end of said piston, a ratchet wheel for operating said rod, a separable connection intermediate the container and ratchet wheel for permitting the container to be manually disengaged from the rod operating mechanism.

18. A paste feeding mechanism having in combination a cylindrical container, a piston therein, a threaded operating piston rod for said piston, a ratchet wheel for operating said rod, a spring pressed pin and sleeve connection intermediate the container and ratchet wheel and co-operating with said rod for permitting the container to be manually disengaged from the rod operating mechanism.

19. In combination, a paste container, a longitudinally movable follower therein, a threaded member for operating said follower, a feed ratchet wheel, a pin and slot connection yieldingly mounted on said member intermediate the ratchet wheel and the container, a master ratchet wheel adjacent the feed ratchet wheel, a pawl adapted to engage and rotate the master ratchet wheel, an arm intermediate said wheels and adapted to be engaged by said pawl whenever a predetermined tooth on the master wheel is engaged thereby, and means carried by the arm for engaging the feed ratchet wheel.

20. In a device of the character described, the combination with a paste container, of a paste-ejecting member therein, a shaft extending transversely of the member, two ratchet wheels on the shaft, one being rigid therewith and the other being loosely mounted thereon, an arm loosely mounted on the shaft and intermediate the wheels, a pawl for engaging and rotating the loosely mounted wheel, said pawl being adapted to engage the arm whenever the notch on the loose wheel is engaged by the pawl, means carried by the arm for moving the rigid wheel, and means whereby movement of the rigid wheel advances the paste-ejecting member within the container.

21. In a shoe polishing machine, the combination with a trackway, of a brush carrying carriage movable thereon, a rotary drive member, a slotted guide member transversely of the trackway, one of said members being stationarily mounted, and the other being mounted on the carriage, and an arm extending between the members whereby rotary motion of the driving member is transformed into reciprocatory motion of the carriage.

22. In a shoe polishing machine, the combination of a track, a carriage movable thereon, brushes mounted on the carriage, a rotary member extending vertically through the carriage, a stationary guide member beneath the carriage and transversely thereof, a block slidably mounted in the guide, and means connecting the block with the rotary member whereby rotation of said member is transformed into reciprocatory motion of the carriage.

23. In combination, a trackway, a carriage movable thereon, brushes on the carriage, a member extending transversely of the carriage, a block slidable on said member, a rotary member carried by the carriage, and means connecting the rotary member with the block for reciprocating the carriage.

24. In combination, a brush-carrying carriage, a stationary guideway, a block movable along the guideway, and means on the carriage for moving the block along the guideway, while confined to a path different from the guideway to reciprocate the carriage.

25. In a shoe polishing machine, the combination with a brush carrier, of a motor for reciprocating the carrier, a ratchet wheel mounted on the carrier and adapted to be advanced one notch upon each reciprocation thereof, a pivoted member disposed in the path of the wheel, means associated with the wheel for moving said member about its pivot, and means whereby operation of said member stops the motor.

26. In combination, a reciprocating carriage, means for operating the carriage, ratchet means carried by said carriage, a member associated with said ratchet means, and means operable by said member for stopping the operation of the carriage.

27. In combination, a reciprocating carriage, means for operating the carriage, ratchet means carried by said carriage, a pin carried by the ratchet means, and means

operable by said pin for stopping the operation of said carriage.

28. In combination, a reciprocating carriage, means for operating the carriage, a ratchet member rotatably mounted on the carriage, a pin projecting from the ratchet member, a lever operable by said pin upon reciprocation of the carriage, and means adapted to be moved by said lever for stopping the operation of the carriage.

In testimony whereof, I hereunto affix my signature.

CLIFFORD A. HARRIS.