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J. FRIEDLANDER.

MACHINE FOR POLISHING SHOES.

No. 524,139. Patented Aug. 7, 1894.

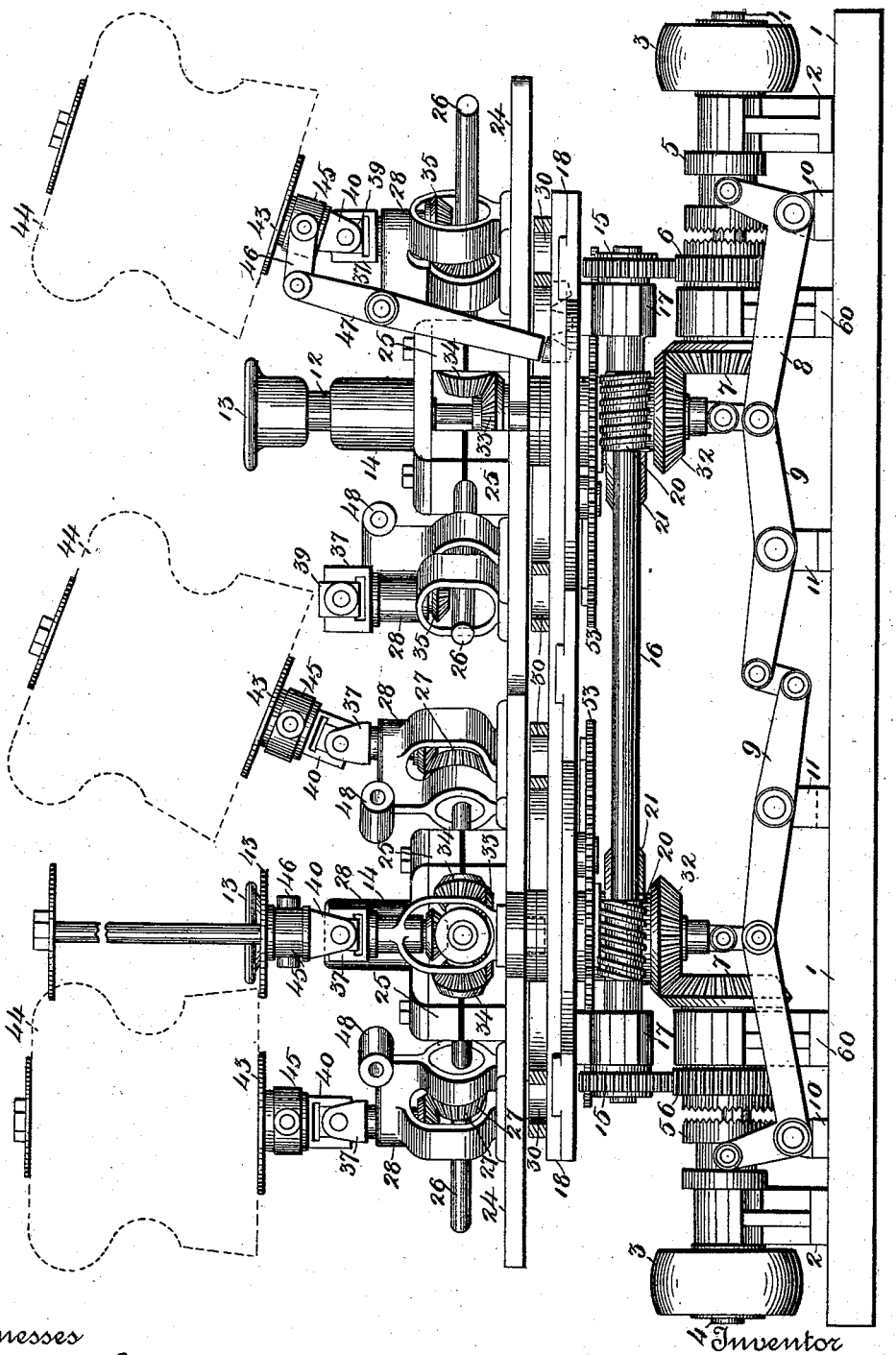

Fig. 1.

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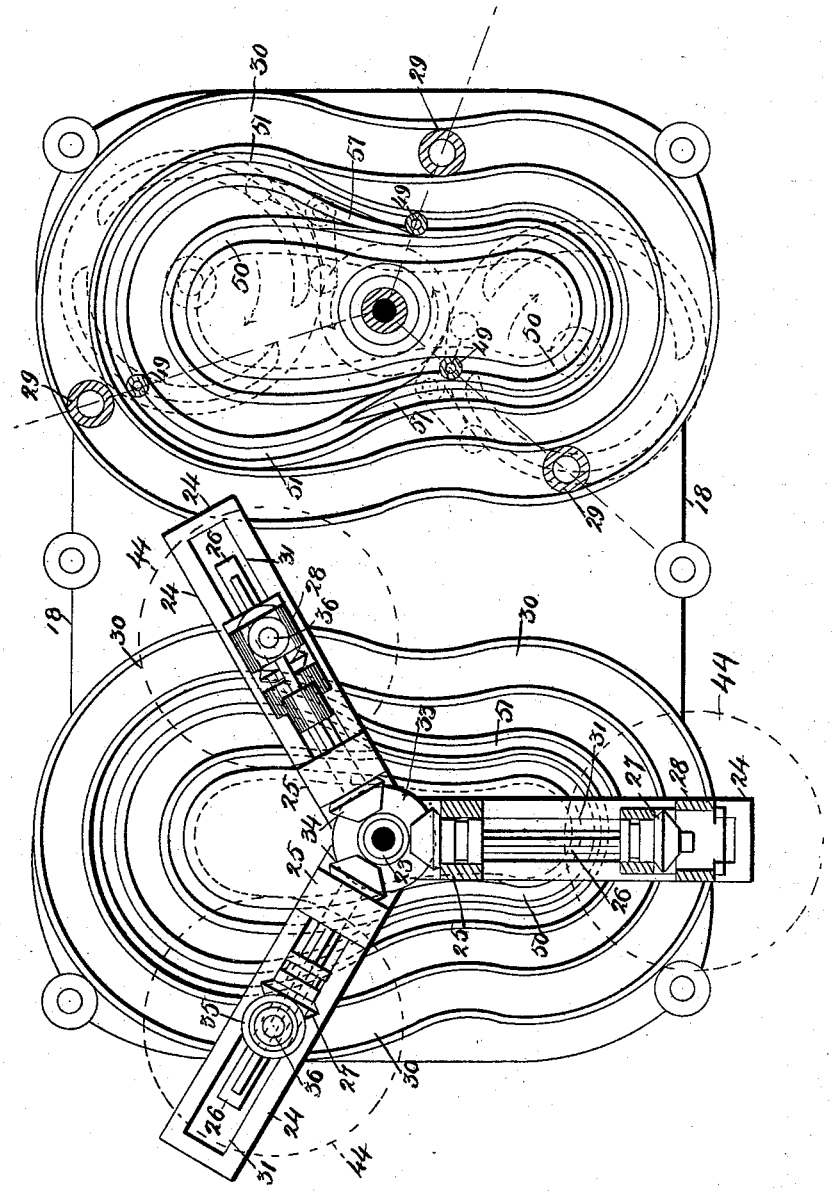
Fig. 2.



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MACHINE FOR POLISHING SHOES.

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Fig. 4.

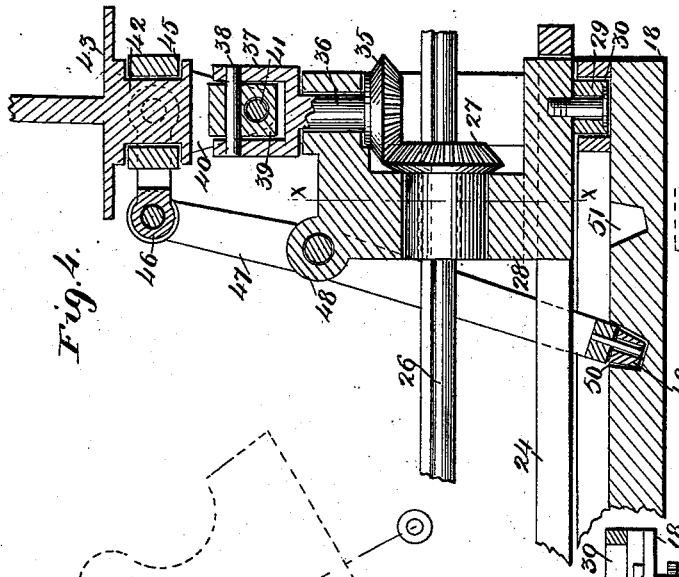


Fig. 5.

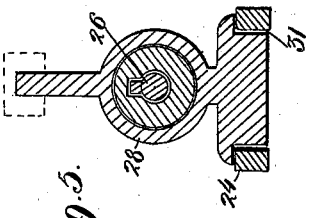
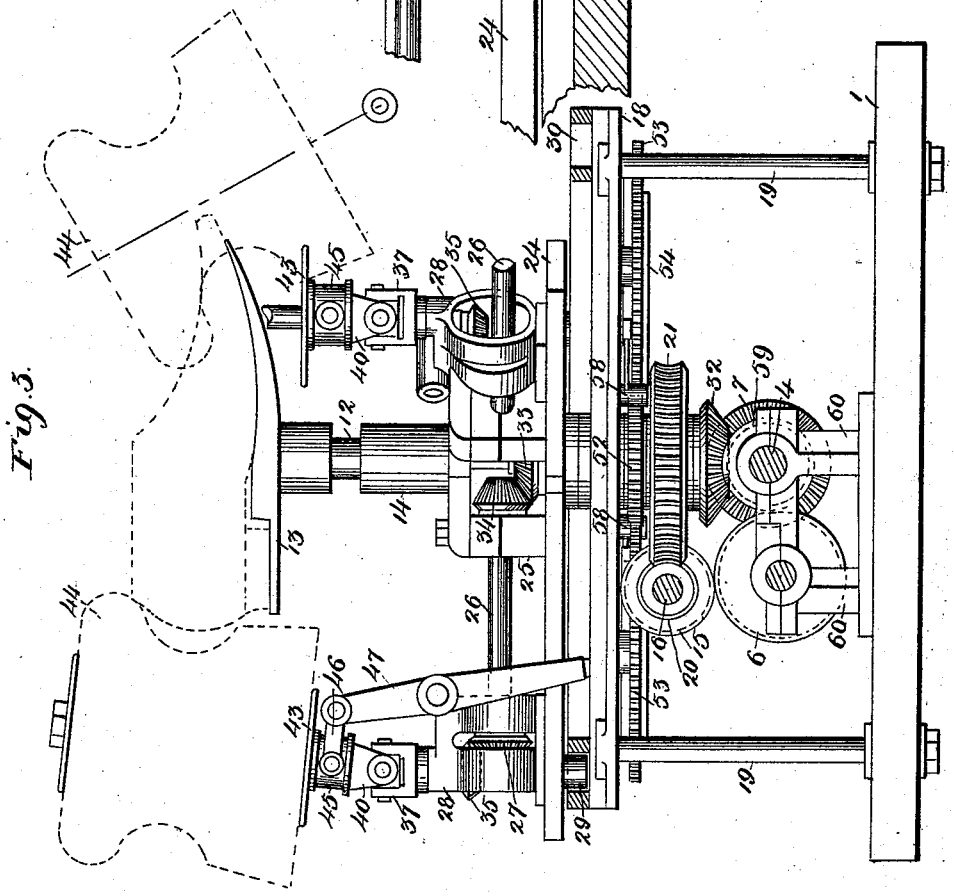


Fig. 3.



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MACHINE FOR POLISHING SHOES.

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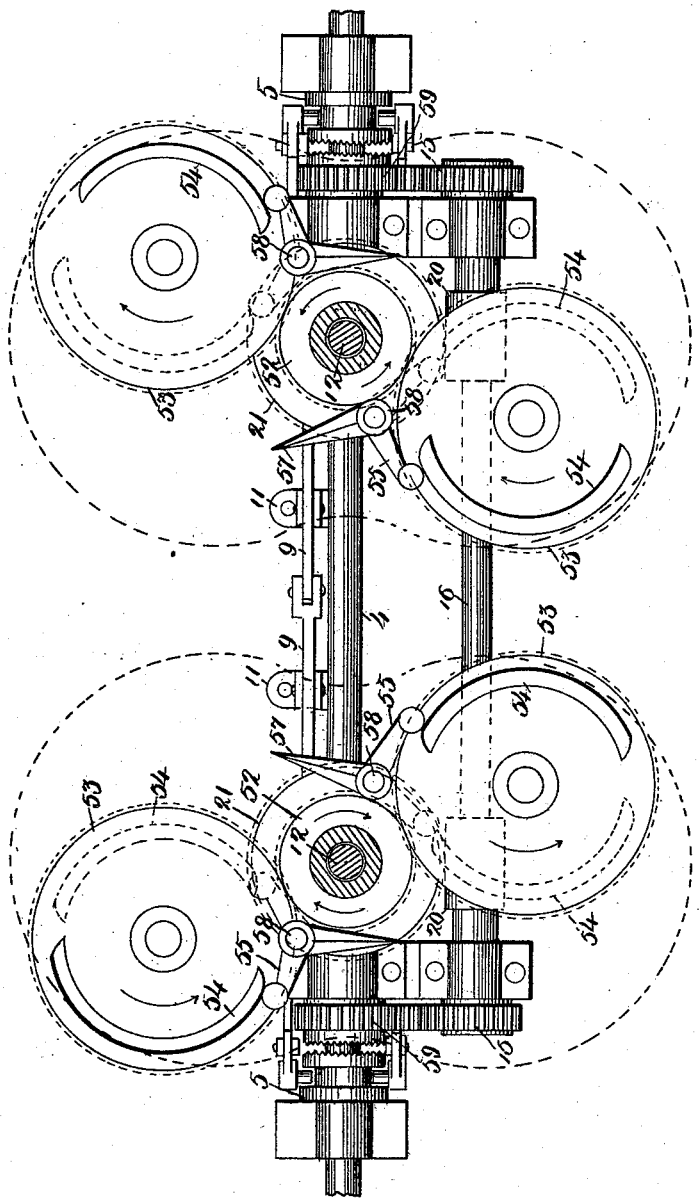
Fig. 6.



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(No Model.) 5 Sheets—Sheet 5.

J. FRIEDLANDER.

MACHINE FOR POLISHING SHOES.

No. 524,139. Patented Aug. 7, 1894.

Fig. 9.

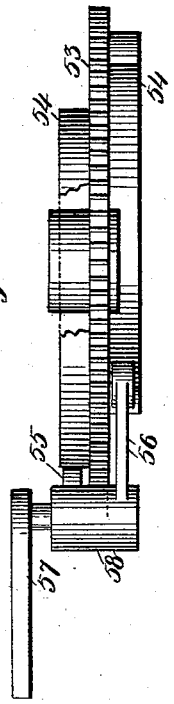


Fig. 10.

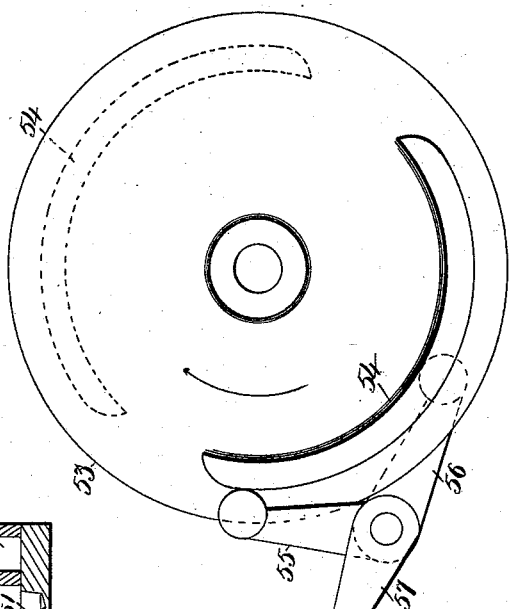


Fig. 1.

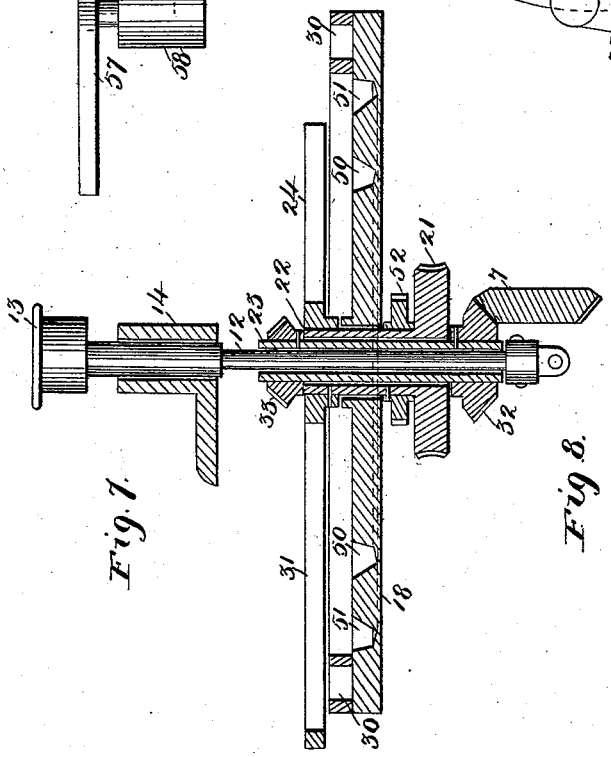
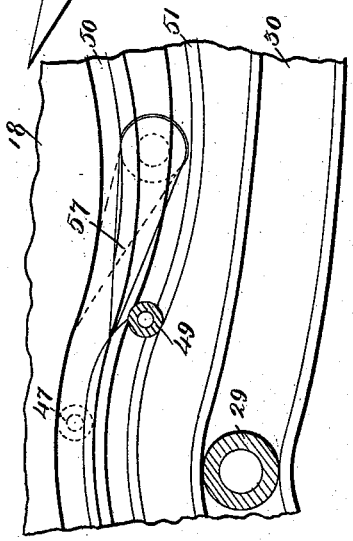


Fig. 8.



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UNITED STATES PATENT OFFICE.

JOHN FRIEDLANDER, OF ST. LOUIS, MISSOURI.

MACHINE FOR POLISHING SHOES.

SPECIFICATION forming part of Letters Patent No. 524,139, dated August 7, 1894.

Application filed May 17, 1894. Serial No. 511,526. (No model.).

To all whom it may concern:

Be it known that I, JOHN FRIEDLANDER, of the city of St. Louis, State of Missouri, have invented certain new and useful Improvements in Machines for Polishing Shoes, Boots, &c., of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in machines for blacking and polishing shoes and consists in the novel arrangement and combination of parts more fully set forth in the specification and pointed out in the claims.

In the drawings, Figure 1 is a front elevation of my machine. Fig. 2 is a plan view of the cam plates with the superposed carrier for the brushes. Fig. 3 is an end elevation of the machine. Fig. 4 is a vertical sectional detail taken through the middle of one of the revolving arms of the carrier. Fig. 5 is a section on the line *x*—*x* of Fig. 4. Fig. 6 is a plan view of the switch mechanism and the gearing operating the same, with the cam plates removed. Fig. 7 is a vertical sectional detail taken through the vertical hollow shaft for rotating the brushes, and through the hollow tubular extension of the gear for revolving the carrier. Fig. 8 is a detail plan of the cam plate with switch co-operating with the cam tracks. Fig. 9 is an elevation of the gearing and the switch operated by it; and Fig. 10 is a plan view of the same.

The object of my invention is to construct a shoe blacking and polishing machine which shall be set in motion by the application and downward pressure of the foot of the person wearing the shoe, and one which will complete the cleaning and polishing operation in a short space of time.

In general the device consists of a suitable base over which is mounted a cam plate carrying suitable tracks conforming to the general contour of a shoe, the said tracks being adapted to properly direct the brushes in their sweep about the shoe, and furthermore to give, through the instrumentality of certain intermediate mechanism, the proper inclination to the brushes as they contact with the shoe in their rotation about their own axes, thus causing the said brushes to make contact with the entire surface intended to be polished. It consists too of mechanism which will impart a slow motion to the brushes in their revolution or sweep about the shoe, and a comparatively rapid motion about their own axes.

The machine is composed of duplicate parts so that both shoes can be operated upon simultaneously.

In detail it may be described as follows:

Referring to the drawings, 1 represents a bed plate on which the machine rests. At opposite ends of the bed plate are mounted in suitable bearings 2 the driving pulleys 3 connected to any suitable source of power. The driving shaft 4 of each pulley is suitably feathered and carries a sliding clutch mechanism 5 which when moved in a proper direction imparts motion to the gear wheel 59 (see Fig. 3) mounted on shaft 4 which is journaled in bearing 60, and also to the bevel gear wheel 7 mounted on the same shaft 4. The two clutches are linked together by a series of levers 8 and 9 pivoted respectively in bearings 10 and 11 on the bed plate 1. From the pivotal point of the levers 8 and 9 there extends upwardly a rod 12 the upper end of which carries a foot rest 13, the upper portion of said rod being suitably guided by a collar 14 projecting from suitable shaft bearings on top of the cam plate and to be hereinafter described.

The pressure of the foot on the rest 13 will depress the rod 12 and as the latter is depressed it will by virtue of the link connections just described cause the clutches 5 to be shifted in proper direction for imparting motion to the gears 59 and the bevel gear 7. A gear wheel 6 also journaled in bearing 60 and meshing with gear 59, meshes with a gear 15 secured to the end of a shaft 16 mounted in suitable bearings 17 at the bottom of a flat cam plate 18 (to be presently described) mounted over the bed plate on props or supports 19. On either side of the middle of the shaft 16 is mounted a worn pinion 20 which meshes with a worm gear 21 depending from the under side of the cam plate 18. The worm gear 21 forms the bottom of a tubular extension 22 which embraces the hollow shaft 23 surrounding the rod 12, which shaft 23 will be presently described. The tubular extension 22 extends above the upper surface of the cam plate 18, and to its upper project-

ing end are secured preferably three arms 24, collectively called a carrier. This carrier is best shown in Fig. 2. At the meeting ends of each arm is secured a fixed bearing 25 in which is mounted one end of a feathered shaft 26, the opposite end of which co-operates with a bevel gear 27 mounted on the sliding bearing 28 at the opposite end of said arm 24. The bottom of each sliding bearing 28 is provided with an anti-friction roller 29 which is adapted to move in the outer cam track 30 of the cam plate 18. The shape of the track 30 conforms to the general contour of the shoe, and as the arms 24 rotate, the sliding bearings 28 are carried around along the track 30, moving of course at the same time to and from the fixed bearings 25, within suitable guides 31 formed on each arm 24.

I have spoken of the shaft 26; I will now describe the mechanism for imparting motion thereto, and the manner in which said shaft imparts motion to the brushes about their axes as they are being carried around the shoe. The hollow shaft 23 above referred to and which embraces the rod 12 carries at its lower end a bevel gear 32 (see Fig. 7) which meshes with the bevel gear 7. The motion imparted to the hollow shaft 23 is rapid as compared with that imparted to the carrier revolved by the worm gear 21. To the upper end of the hollow shaft 23 is secured a bevel gear 33 with which meshes the beveled pinion 34 of each feathered shaft 26 above referred to. The feathered shaft 26 operates the bevel gear 27 keyed thereto as best shown in Fig. 5, and the gear 27 meshes with the beveled gear wheel 35 mounted at the outer upper portion of the sliding bearing 28. The shaft 36 of the gear wheel 35 carries a fork 37 within which is mounted by means of a pin 38 a block 39 and to the block 39 are pivotally secured the embracing arms 40 by means of a pin 41. The arms 40 form the lower portion of the cylindrical stem 42 of the disk 43 over which the brush 44 is mounted and to which it is secured. As the arms 40 freely span the block 39 and the block itself is adapted to oscillate on the pin 38, it is apparent that this arrangement forms a knuckle joint at this point and thus allows the brush to be tilted to any desired inclination.

Loosely embracing the cylindrical stem 42 is a collar 45 to which are pivotally secured the ends of the arms 46 between the outer ends of which is loosely secured the lever 47 having a pivotal bearing 48 on the upper surface of the sliding bearing 28. The lower end of the tilting lever 47 carries an anti-friction roller 49 adapted to run in the cam tracks 50 and 51 in a manner to be now described.

It is apparent from the above that as the carrier composed of the revolving arms 24 is revolved as already described, each arm will carry around in the path of the cam track 30, the sliding bearing 28, and as best seen from Fig. 4, the said bearing will carry the brush 44 with it, and while the brush is thus being carried around, it will at the same time be rotated about its own axis by the bevel gear wheel 35 meshing with the bevel gear wheel 27 operated by the shaft 26. It is apparent too that as the brushes are thus carried around the shoe, they should successively receive different inclinations so as to come progressively in contact with the different portions of the surface of the shoe. In Fig. 4, while the lower end of the tilting lever 47 is describing the path of the cam track 50 the brush secured to its opposite end will assume one inclination, and when the lower portion of the same lever describes the path indicated by the outer cam track 51, the brush will assume another inclination thus coming progressively in contact with different portions of the surface of the shoe treated (see dotted positions of the brushes in Fig. 3). It becomes necessary therefore to devise mechanism for shifting the lower end of the lever 47 from one cam track to the other and back again to the first so as to give different inclinations to the brushes in their revolution about the shoe. This mechanism is as follows: Immediately above the worm gear wheel 21 (see Fig. 7) is secured to the tubular extension 22, a gear wheel 52 meshing with the large gears 53 on either side thereof, the said gears 53 depending from the bottom of the cam plate 18. On opposite faces of the gear 53 and diametrically separated from each other, are secured segmentally curved guide strips 54. As the gear 53 is revolved (it being revolved by the shaft 16 which drives the carrier above the cam plate) the guide strips 54 come successively in contact with the arms 55 and 56 of a switch 57 pivoted in a bearing 58 on the cam plate and in such a position that the switch becomes a part of one or the other cam track according to the position occupied by said switch, very much as a switch on a railroad track. As the gear 53 revolves the strips 54 of course operate the switch 57 alternately in opposite directions, one strip 54 operating one arm 55 on one side, and the strip 54 on the opposite side restoring the switch by operating the arm 56 on the opposite side. Of course the switching operation is not done suddenly, it not being completed until the strip 54 has completely passed the end of the arm 55 or 56, but the mechanism is so timed that after the roller 49 has made a sweep of one track 50, it will be shifted on to the track 51, from which it will be shifted back again on to the track 50, and so on indefinitely; so that this arrangement will give the brushes a varying inclination in their rotation, and during their revolution about the shoe.

There are three brushes used in the present device, one stiff brush for scraping off the dirt from the shoe, one brush for applying the blacking to the shoe, and one for polishing the shoe. The blacking is put on the brush in the present instance by hand, but I have devised special mechanical means for

doing this, which is to be made the subject matter of a separate application.

The operation is obvious from the description. It is apparent from the arrangement of gearing best shown in Figs. 1 and 7, that the motion for carrying the brushes about the cam track 30 and thus about the shoe, is a slow one, this being necessarily so to give ample time for a polish; but the motion for rotating the brushes about their own axes is comparatively rapid so that a polished surface can be insured. The rapid motion is imparted through the medium of gear 7, gear 32, hollow shaft 23, gear 33, bevel pinion 34, shaft 26, gear 27, gear 35, shaft 36, and cylindrical stem 42 carrying the brush. It will therefore be seen that as the brushes are carried around the cam tracks at a slow rate, and in conformity to the contour of the shoe, they are rotated rapidly about their own axes, and progressively tilted or inclined so as to sweep the entire surface of the shoe to be cleaned and polished.

Having described my invention, what I claim is—

1. A shoe blacking and polishing machine comprising a suitable foot rest adapted to be depressed, means secured to the same for imparting automatically motion to said machine upon depression of said rest, suitable brushes revolving about said rest, and means for imparting rotary motion to said brushes, substantially as set forth.

2. In a shoe blacking and polishing machine, a suitable revolving carrier, brushes mounted on said carrier, a flat cam plate having suitable tracks for guiding the movement of the brushes, mechanism for tilting said brushes, and additional cam tracks for operating said tilting mechanism and thus varying the inclination of the brushes on their axes, substantially as set forth.

3. In a shoe blacking and polishing machine, a suitable revolving carrier, brushes mounted on the same, a flat cam plate having suitable tracks for guiding the movement of the brushes, mechanism for tilting said brushes, additional cam tracks for operating the tilting mechanism, and a suitable switch device for varying the path of the tilting mechanism, substantially as set forth.

4. In a shoe blacking and polishing machine, a carrier comprising a series of revolving arms, suitable brushes adapted to move along said arms, a suitable joint connection for said brushes for varying the inclination of each brush, a flat cam plate and suitable cam tracks carried by said plate for guiding the movement of the brushes, substantially as set forth.

5. In a shoe blacking and polishing machine, a revolving carrier comprising a series of slotted arms, a brush carried by each arm, and means for moving said brush longitudinally along each arm, substantially as set forth.

6. In a shoe blacking and polishing machine, a revolving carrier comprising a series of arms, a shaft mounted on each arm, a fixed bearing for each shaft, a movable bearing for each shaft, and a brush carried by each movable bearing, and means for imparting a rotary motion to each shaft and brush, substantially as set forth.

7. In a shoe blacking and polishing machine, a suitable flat cam plate, series of cam tracks on said plate conforming to the contour on the shoe, suitable brushes, suitable tilting mechanism, one series of tracks adapted to guide the brushes and the other series to control the tilting mechanism, substantially as set forth.

8. In a shoe blacking and polishing machine, a suitable cam plate having a series of cam tracks, a switch for alternately completing the continuity of two adjacent tracks, and means for operating said switch, substantially as set forth.

9. In a shoe blacking and polishing machine, a suitable bed plate, suitable driving mechanism mounted on said plate, clutches for engaging and disengaging said mechanism, a suitable foot rest, a rod secured to said rest, and a series of linked levers between said rod and clutches for engaging the latter with the driving mechanism upon suitable pressure on the foot rest, substantially as set forth.

10. In a shoe blacking and polishing machine, suitable driving mechanism, a shaft carrying a worm pinion co-operating therewith, a worm gear meshing with said pinion, a cam plate, a tubular extension on said worm gear passing through the middle of the cam plate, and a revolving carrier secured to the tubular extension above the cam plate, substantially as set forth.

11. In a shoe blacking and polishing machine, suitable driving mechanism, a shaft carrying a bevel gear driven by the same, a second bevel gear meshing with the first pinion, a hollow shaft secured to said gear wheel, a bevel gear wheel secured to the upper end of said hollow shaft, a suitable carrier having a series of arms surrounding said hollow shaft, a shaft carried by each arm one end thereof having a pinion meshing with the bevel gear wheel secured to the top of the hollow shaft, and a brush carried by the opposite end of each of said shafts, substantially as set forth.

12. In a shoe blacking and polishing machine, a suitable carrier having a series of arms, each arm having a fixed bearing, and a sliding bearing, a bevel gear wheel secured to said shaft and mounted in the sliding bearing, a second bevel gear wheel on said sliding bearing meshing with the first named gear wheel, a vertical shaft secured to the second bevel gear wheel, said shaft carrying a universal joint connection, a brush secured to said joint, a roller secured to the bottom of the sliding bearing, a suitable cam track for said roller, and a feather on the first shaft whereby the sliding bearing is adapted to

move to and from the end of said shaft, substantially as set forth.

13. In a shoe blacking and polishing machine, a carrier composed of a series of revolving arms, a sliding bearing on each arm, a lever pivoted to said bearing, a pivoted brush controlled by the upper end of said lever, and a series of cam tracks for guiding the lower or opposite end of said lever, substantially as set forth.

14. In a shoe blacking and polishing machine, a suitable cam plate having a series of cam tracks, a switch for completing the continuity of one or another of said tracks, arms extending from said switch, revolving gear wheels having a series of segmental guide strips for alternately throwing the switch first in one direction and then the opposite direction, substantially as set forth.

15. In a shoe blacking and polishing machine a switch operating gear having segmental guide strips on opposite sides of the same and diametrically located with respect to each other, substantially as set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

JOHN FRIEDLANDER.

Witnesses:

JAMES J. O'DONOHOE,

EMIL STAREK.