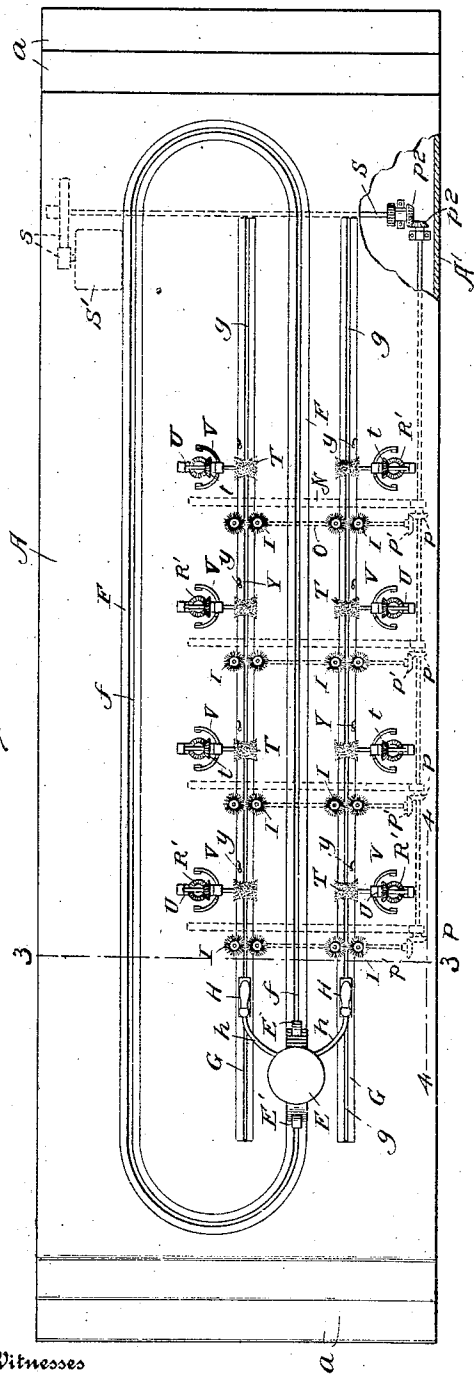


F. HUMPHREVILLE.
SHOE POLISHING MACHINE.
APPLICATION FILED OCT. 31, 1908.

941,345.

Patented Nov. 23, 1909.
3 SHEETS—SHEET 1.

Fig. 1.

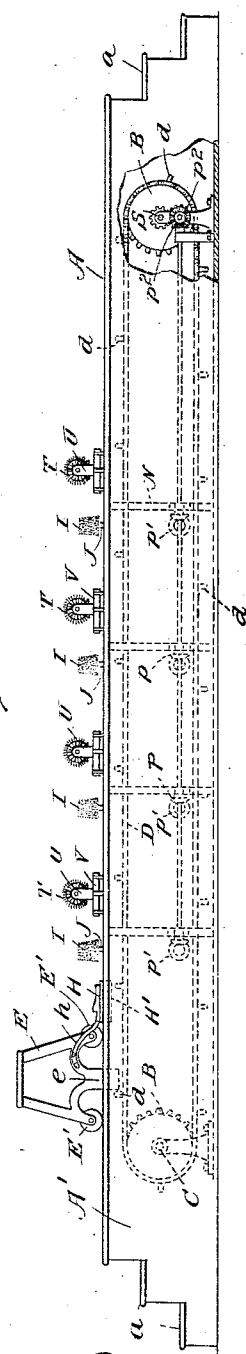


Witnesses

Edwin L. Bradford
Richard E. Babcock

By

Fig. 2.



Inventor

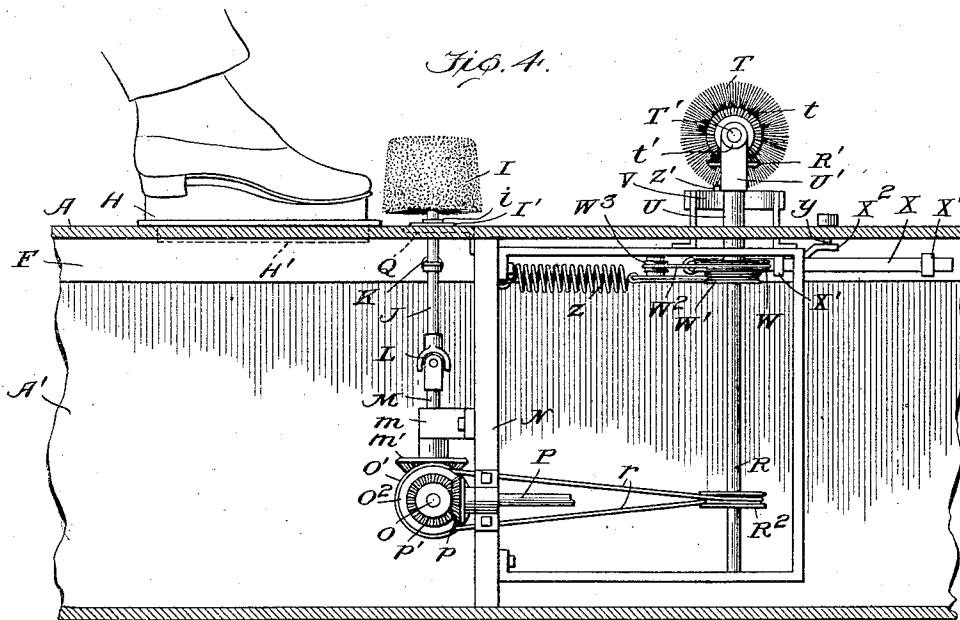
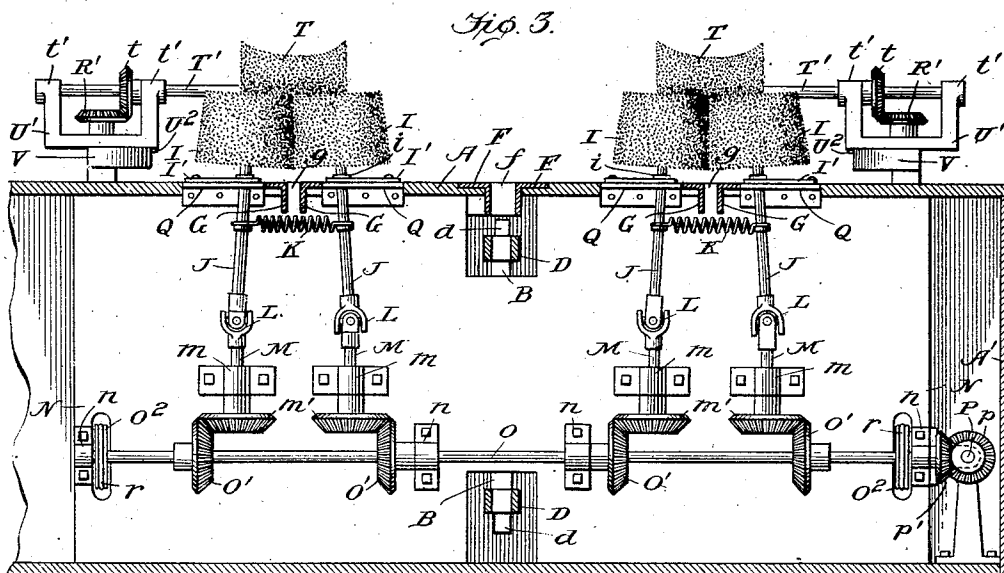
Frank Humphreville
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3 SHEETS—SHEET 3.

Fig. 5.

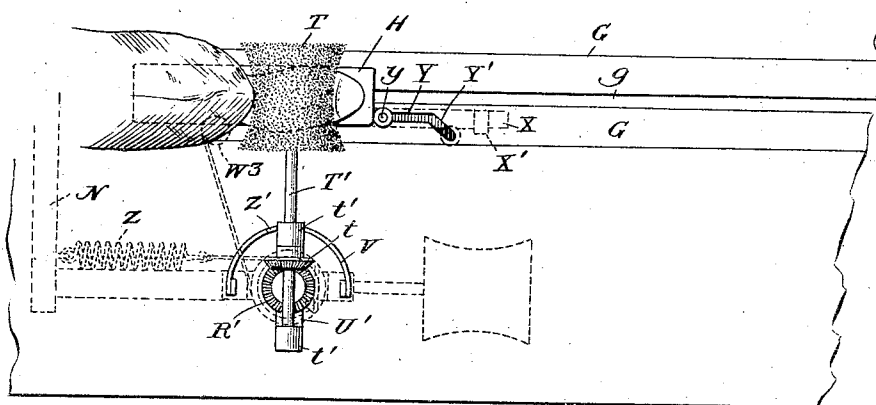


Fig. 6.

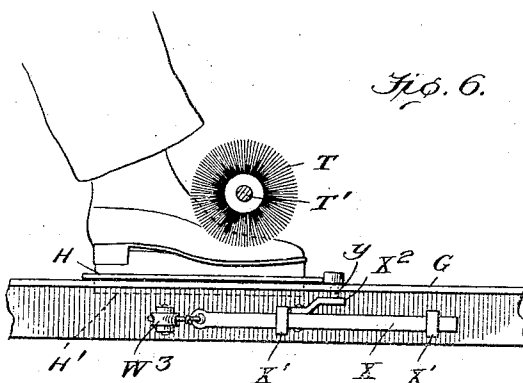


Fig. 9.

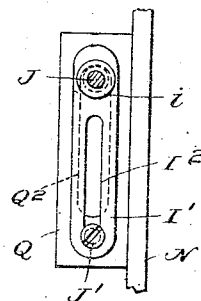


Fig. 7.

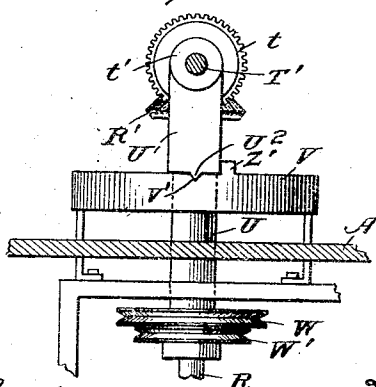
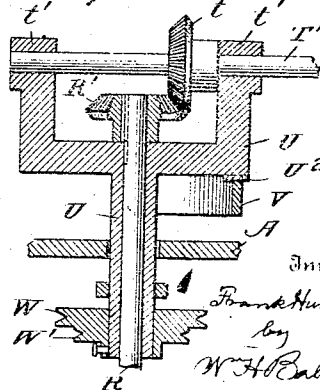


Fig. 8.



Witnesses

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Inventor

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UNITED STATES PATENT OFFICE.

FRANK HUMPHREVILLE, OF LANCASTER, PENNSYLVANIA, ASSIGNOR TO EDWIN HUMPHREVILLE, OF LANCASTER, PENNSYLVANIA.

SHOE-POLISHING MACHINE.

941,345.

Specification of Letters Patent.

Patented Nov. 23, 1909.

Application filed October 31, 1908. Serial No. 460,533.

To all whom it may concern:

Be it known that I, FRANK HUMPHREVILLE, a citizen of the United States, residing at Lancaster, in the county of Lancaster and State of Pennsylvania, have invented certain new and useful Improvements in Shoe-Polishing Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The main object of this invention is to provide for brushing and polishing boots and shoes on the wearer's feet by means of pairs of brushes acting on the sides of said shoes and additional brushes for the tops of said shoes, the foot rests and the chair for each wearer being carried along by mechanism so as to bring the shoes properly into contact with said brushes, the chairs and foot rests being afterward moved around the chair track to their first position. To effect this general object, I provide certain novel devices for thus carrying said chair and foot-rests in guide ways constituting an endless track; certain novel devices for supporting, rotating and adjusting the pairs of side brushes; certain devices for automatically holding the top brushes in proper position until their work is done, then moving them out of the way of the shoes for the foot to pass and temporarily holding them in such position out of use and finally automatically restoring them to their operative position ready for the next pair of shoes.

My invention also consists in divers details and incidental improvements of said machine substantially as hereinafter set forth and claimed.

In the accompanying drawings Figure 1 represents a plan view, partly broken away of a machine embodying my invention; Fig. 2 represents a side elevation of the same, also partly broken away; Fig. 3 represents a section of the same on the line 3—3 of Fig. 1; Fig. 4 represents a vertical longitudinal section of a part of the same on line 4—4 of Fig. 1; Fig. 5 represents a plan view of one of the top brushes and proximate parts; Fig. 6 represents a detail side elevation of a top brush lifted by the shoe, with other parts; Fig. 7 represents a detail side elevation of the locking devices for a top brush; Fig. 8 represents a detail section of parts of the

gearing and Fig. 9, a side view of the slotted plates for one of the side brushes.

A designates the elevated platform of my machine, which is preferably an elongated rectangular quadrilateral in form, having steps *a* at each end for conveniently ascending and descending, and sides *A'*, said steps, sides and platform constituting a hollow casing for the two sprocket wheels B, their shafts C and S and their endless chain D, whereby each chair E is carried along by contact of any lug *d* of a series raised at intervals on said chain with a block or lug *e* extending downward from said chair through a slot *f* of a guide-rail or track F fixed to platform A, said slot and rail being endless and of elliptical form. One side of this elliptical track is directly over the said chain. The said wheels are fast on their shafts, one of these shafts being the main driving shaft of the machine, so as to keep up the forward motion of the chain and of all chairs in position to be acted on thereby. For convenience of illustration only one chair is shown in the drawings, but of course there may be several, all traveling along together. Said driving shaft may be actuated by a motor S' through suitable gears *s* or in any other convenient way.

G designates a pair of additional rails or tracks for the shoe supports or foot rests H, which are connected to the chair by arms *h* and run on said tracks. Each of these additional rails or tracks has a longitudinal slot *g* throughout its length and these slots receive small lugs H' on the bottom of foot rests H, which lugs extend a slight distance down into them, in order that the said rails may guide as well as support said foot rests, though readily permitting their disengagement at will by manually tilting the chair on its rollers E, which run on track F. That part of said track on which the chair is drawn forward by said chain is located between these two additional tracks or rails.

I designates a pair of upwardly tapering brushes which receive a shoe between them and polish the same as the foot rest moves on as hereinbefore described. These brushes are carried by shafts J, which are drawn toward each other by an intervening spring K and connected by universal or double joints L to short vertical shafts M, journaled in bearings *m* which are fastened on frame

N. A shaft O, extending transversely of the machine and turning in bearings *n* on said frame, carries beveled pinions O', engaging similar pinions *m'* of shafts M, and thus drives a pair of rotating side brushes I. Said shaft O is driven by the main shaft S through suitable intermediate gearing. Preferably as shown, a longitudinal shaft P is employed for this purpose, connecting with all the shafts O by bevel gear pinions *p* and *p'* and having as many pinions *p'* as there are shafts O. Bevel gear pinions *p*² *p*² connect shafts S and P for transmitting rotation to the latter. The first pair of side brushes I in the order of travel is generally used for cleaning the shoe, the second for applying blacking, the third for polishing and the fourth for completing the polish. The material of the brushes may vary accordingly. But these are matters of convenience and choice, not obligatory. As the devices for operating each pair of side brushes are the same, only those for one pair have been shown in full.

Each side brush shaft J turns in a bearing or bushing *i* of a plate I', movable transversely over another plate Q, fixed to said frame. Each of these plates has a slot marked respectively I² and Q², running longitudinally of said plates and transversely with respect to the machine. Shaft J passes up through slot Q² and is permitted thereby to play on its joint L toward or from the other shaft J of that pair, giving it more or less lateral inclination. A stud J' on fixed plate Q passes up through slot I², so that the plate I is permitted to slide laterally over plate Q with such lateral pivotal movements of shaft J and is guided in such sliding by said stud and the walls of slot Q², the double or universal joint L permitting such movement without binding while the shafts J and M rotate together as described. The forward movement of foot and shoe with the foot rest forces the pair of brushes I apart against the pull of spring K and the latter holds them yieldingly against the shoes at less inclination than before. After the shoe passes the two brushes rest evenly against each other from end to end. The tapering shape and inclined position of said brushes are found to best adapt them for fitting against the inclined and hollowed surfaces of the inner sides of the shoe. The slot Q² in each fixed plate Q is made broader than the diameter of said shaft, to allow play of such shafts thus jointed, and the stud J' permits slight pivotal movement of plate I corresponding to such movement of said shaft.

A belt *r* from a pulley O² turning with shaft O, to pulley R² on a vertical shaft R drives the latter in its bearings carried by the frame. A pinion R' of the latter shaft meshes with a pinion *t* on the shaft T' of the upper or top brush T, which operates

on the top of the shoe a little beyond the pair of side brushes I in the direction of travel. This top brush has a concave surface, to fit better on the rounded surface of the instep. Its shaft T' is mounted for rotation in horizontal bearing *t'* of an angular bracket U', which moves as one piece with a sleeve U, surrounding the upper part of shaft R and having slight vertical play thereon. This play suffices to allow a tooth U² of said bracket below said bearing to settle into a notch V' of a fixed horizontal semi-circular bar or rail V, or to ride up on the said bar out of said notch, as the said sleeve, bracket, shaft and brush are lowered or raised and turned, all together. Said sleeve has a grooved pulley W and a wheel W' mounted on it, so that it and these two wheels turn together. A cord W² is connected to said pulley W and passes around the same and around a guide pulley W³, mounted horizontally at a fixed point to one of the tracks G last mentioned, its other end being connected to the rear end of a bar X which slides in guide ways X' of said track. An arm X² of said bar, pivoted thereto, carries a stud *y* which extends upwardly through a longitudinal guide slot Y of the said track into the path of the footrest traveling thereon. The forward end of said guide slot is inclined laterally at Y'. A replacing spring Z is connected to wheel W' in such manner as to act in opposition to the pull of the bar X on pulley W and sleeve U as said bar moves forward, the other end of said spring being fastened to the frame or other fixed point. A stop Z' on bar or rail V prevents said bracket and brush from being drawn backward too far. Their normal position is with the tooth U² in the notch V' and the top brush across the line of travel of the foot-rest and shoe.

The operation of these devices is as follows. When the shoe having been acted on by the rotating side brushes, reaches the top brush, the latter, also rotating, brushes the top of the shoe and the instep. The wedge like action of said instep then raises said brush and its shaft and said bearing, thus freeing tooth U² from notch V' and the forward pressure of the traveling foot rest against stud *y* carries said stud along the longitudinal part of guide slot Y' with similar motion of arm X² and bar X and consequent pull on cord W² and pulley W, turning sleeve U and bracket U', so as to turn shaft T' and top brush T laterally out of the path of travel of the shoe. As the stud *y* reaches the laterally inclined end Y' of slot Y, the pivotal attachment of arm X permits the rounded corner of said foot rest to force said stud into said inclined end of the slot and said foot-rest holds it there until it passes said stud, the top brush being quite out of the way during this period. As soon

as the foot rest has passed the said stud the latter is free. The action of the replacing spring then first draws it again into the longitudinal part of said guide slot and then

promptly returns the brush bracket, sliding bar and connected parts to their first or normal position. At the beginning of this replacing movement the said pivoted arm yields as before to permit the return of the stud *y* from the laterally inclined end of the slot into the main longitudinal part thereof.

During the above described action of the said side and top brushes on one boot or shoe, the corresponding brushes are of course

acting in the same way on the other shoe and passing through the same succession of movements simultaneously to effect the same end. This is repeated with each successive two pairs of side brushes and their top brush. Of course it is possible to dispense

with all except the first set of side brushes and top brush, the blacking being applied by hand or otherwise before their action. At the end of the brushing journey the occupant of each chair leaves it, passing down the steps; an attendant tilts the chair slightly to remove the lugs *H'* from the slots and then moves the chair on its rollers

around to the other side of the platform and to the end from which they start. One chair is always near the starting point. The next customer takes his seat in it. The attendant pushes it far enough forward for the block *e* to be caught by the next lug *d* of the chain so that the latter will carry the chair and its footrests forward as described. In the meantime the next chair has been pushed to the place at first occupied by the first chair, and this is repeated as often as customers appear or until all the chairs are in use. The return side of the elliptical track constitutes a source of supply of chairs awaiting occupants.

The gearing of the machine is calculated to rotate the brushes much faster than the sprocket wheel driving the endless chain. I do not confine myself to any particular form of frame or shafts or brushes or bearings, though the forms shown are generally preferred.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. In shoe brushing mechanism, an endless chair track, and foot rest tracks parallel to a part thereof, in combination with brushes arranged to act on shoes passing along said foot rest tracks, foot-rests for such shoes and mechanism for moving the chair and foot-rests forward into contact with said brushes and beyond the same.

2. In shoe-brushing mechanism, a pair of side brushes and means for automatically rotating them, in combination with a foot-rest and mechanism for moving forward the

wearer said foot rest and the shoe supported thereby, thus causing said shoe to pass between said brushes substantially as set forth.

3. In shoe brushing mechanism, a pair of side brushes and their shafts, said shafts being provided with universal joints and having a limited lateral play toward and from each other, in combination with means for yieldingly drawing said brushes together, means for rotating said shafts, foot rests and a seat and means for moving said foot rests and seat forward, said foot rests in such operation passing between said brushes substantially as set forth.

4. In shoe brushing mechanism, a pair of side brushes and their shafts *J*, in combination with shafts *M* and joints connecting said shafts, means for rotating the shafts thus connected, sliding plates provided with bearings for the shafts carrying the brushes and fixed plates provided with slots which receive these shafts and are of sufficient width to permit their lateral play, said fixed plates and sliding plates having stud and slot connections adapted to such play and also allowing the play of the brushes toward or from each other substantially as set forth.

5. In shoe brushing mechanism, a top brush and its shaft, in combination with means for turning them and connections permitting said shaft and brush to move out of the path of the shoe, a foot-rest for the latter and means for moving forward both the foot-rest and the wearer of the shoe, in order to bring the upper of the shoe against and under said brush substantially as set forth.

6. In shoe-brushing mechanism, a top brush and its shaft, means for temporarily locking said shaft in position to operate on the upper of the shoe, devices for turning said shaft and brush, connections permitting said brush and shaft to move pivotally out of the way of the shoe when unlocked and means for moving said footrest forward under said brush, said locking means being adapted to yield and unlock as the instep lifts the brush in passing under the latter.

7. In shoe brushing mechanism, a top brush and its shaft, a vertically movable bearing bracket for said shaft, a fixed part with which the under side of said bracket has a free tooth and notch engagement, unlocked by lifting said brush, a foot-rest and means for moving said foot rest forward under said brush, that the instep may lift the brush and thus unlock it, the said brush and shaft being then free to move out of the way of the brush.

8. In shoe brushing mechanism, a top-brush, its shaft, a bearing bracket for the latter, a sleeve connected to and supporting said bracket, a vertical shaft geared with and turning the first named shaft and on which the said sleeve has vertical play, a foot rest, means for moving said foot-rest

forward under said brush, mechanism for rotating said vertical shaft and devices operated by said foot-rest in its forward movement to turn said sleeve on said vertical shaft and thus move said brush out of the path of the shoe as the latter travels forward.

9. In shoe brushing mechanism, a top brush, its shaft, a bearing bracket for the latter, a sleeve carrying said bearing bracket, a vertical shaft gearing with said brush shaft and having said sleeve on it, means for rotating said vertical shaft, a shoe rest, means for moving said shoe rest forward under said brush, a pair of wheels turning with said sleeve, a spring acting on one of said wheels to turn said sleeve backward, a part arranged to be struck by said foot rest and moved forward and intervening devices connecting the other wheel to said part and arranged so that such action of the foot rest on the latter will turn said sleeve forward thus moving the said brush out of the way of the shoe.

10. In shoe brushing mechanism, a top brush, its shaft, a bearing bracket for the latter, a sleeve carrying said bracket and having vertical play on said shaft, a foot rest, means for locking said bearing to hold said brush across the line of travel of said foot-rest and the shoe thereon, but to be unlocked by the lifting action of the instep, means for moving said foot-rest forward under said brush, a part adapted to be struck and carried forward by said foot rest, connections between said part and said sleeve for turning the latter forward to move said brush out of the path of the said shoe, means for automatically replacing said sleeve and said part in their first position after the passage of the foot rest and shoe, means for permitting said foot rest to pass said part and hold the latter against moving backward until said foot rest has entirely passed, a shaft which drives said brush shaft and on which said sleeve is mounted and means for rotating said shaft within said sleeve substantially as set forth.

11. In shoe-brushing mechanism, a top brush and its shaft, in combination with a foot rest having a rounded forward corner, means for moving said foot rest forward under said brush, a stud arranged to be struck by the foot-rest and thus carried forward and also turned off laterally by said rounded corner, a fixed part having a guide slot for said stud, which slot has an inclined forward portion permitting said corner to move said stud out of the way of said foot rest, and permitting also the side of the foot rest to hold it in this position until said foot rest has entirely passed, an arm to which said stud is attached, a longitudinally sliding bar to which said arm is pivoted, a shaft geared to said brush shaft, a sleeve

turning on the former shaft, means for rotating this shaft, means connecting said sliding bar to said sleeve for turning the latter forward to move said brush out of the way of the foot-rest and shoe and hold it so, and a replacing spring acting on said sleeve and the parts connected thereto when the passage of the foot has freed said stud, permitting it to reënter the main part of said slot and return along the same to its first position substantially as set forth.

12. In shoe brushing mechanism, two parallel slotted tracks, in combination with a pair of foot rests having short lugs in said tracks though said rests are easily separable therefrom, an endless chair track, a chair running on said track connected to said foot rests and also easily separable from its track, sets of brushes arranged at intervals along the two tracks first mentioned, for successively acting on the shoes as the latter travel forward on said tracks, means for actuating said brushes and means for moving said chair along its track, in order that said foot rests and the shoes thereon may be carried along their tracks and be brushed substantially as set forth.

13. In shoe brushing mechanism, a pair of tracks, in combination with foot rests running along the same and guided thereby, means for causing such motion of the foot-rests, two sets of brushes each consisting of two side brushes and one top brush for acting on the pair of shoes carried by said foot rests, mechanism for rotating all of said brushes and means for automatically moving the top brush out of the way of the shoe after the brushing and afterward permitting it to return to its first position ready for the next shoe as set forth.

14. In combination with a pair of foot rests and means for moving forward the same and the wearer of the shoes resting thereon two sets of brushes which are stationary with respect to the forward travel of said foot-rests and shoes and their wearer arranged to act on such shoes respectively, as they are thus carried forward.

15. In combination with a pair of foot rests, a track, means for moving along said track the said foot rests and the wearer of the shoes resting thereon, and sets of brushes which are stationary with respect to the forward travel of said foot rests arranged for contact with said shoes while the latter are moving.

16. In combination with two sets of movable brushes and means for moving them, a pair of footrests, means for moving said foot rests and the wearer of the shoes resting thereon, to pass the shoes between said brushes and in contact therewith, and mechanism for moving said brushes while in contact with the shoes.

17. In shoe brushing mechanism, a top

brush, means for temporarily locking the same in position to act on a shoe, supporting devices for said brush adapted to be raised by the action of the instep on the under side of the brush, thus freeing said locking means, and also adapted to turn axially for removing said brush from the line of travel of the shoe, a foot rest, means for moving it forward under said brush, a movable part arranged to be struck and carried along by said foot rest, then moved laterally out of the way thereof and locked there until said foot rest has passed, connections between said part and the supporting devices of the

brush whereby the latter is temporarily moved out of the way of the shoe, means for automatically returning said brush to its first position after the release of said movable part and means for rotating said brush for the purpose set forth. 15 20

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

FRANK HUMPHREVILLE.

Witnesses:

JOHN L. FLETCHER,
RICHARD E. BABCOCK.