FOOTWEAR WIPING MACHINE

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References Cited
UNITED STATES PATENTS
846,020 3/1907 Foid .................................. 15/36
3,060,475 10/1962 Dufault .................................. 15/36
3,066,338 12/1962 Nappi .................................. 15/31 X
3,737,942 6/1973 Casey .................................. 15/36 X

FOREIGN PATENTS OR APPLICATIONS
105,687 2/1927 Austria .................................. 15/34
765,669 3/1934 France .................................. 15/36
1,108,114 8/1955 France .................................. 15/36

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Abstract
A machine for wiping footwear as worn by a person. The machine comprises a plurality of rotary brushes for cleaning the sole of footwear, such as a boot, shoe, overshoe or the like. Additional rotary brushes clean the side and top of the footwear upper. All of the brushes are driven by an electric motor controlled by a switch conveniently accessible to the user. The mechanism is enclosed in a housing having an opening for receiving the footwear clad foot of the user.

4 Claims, 6 Drawing Figures
FOOTWEAR WIPING MACHINE

The present invention relates to a machine for cleaning or wiping footwear. There already exist various shoe polishing machines, including power-operated rotary brushes in a housing, working in cooperation with polish or wax dispensers. However, these known machines are not suitable for wiping or cleaning a soiled footwear, especially the sole thereof, the brush arrangement being solely designed to brush the footwear upper.

In cities located in northern climate and wherein salt or other snow-melting chemicals are used in winter-time, partially melted dirt laden snow clings to one's footwear and is transported within buildings, soiling the floors of the same as it melts.

It is an object of the invention to provide a machine which will effectively wipe and clean boots, overshoes, rubber and the like as worn by persons, so as to prevent soiling of building floors.

A more specific object of the invention is the provision of a small power-operated footwear wiping machine designed to be installed at the entrance of buildings, offices, homes and the like, so as to be used by a person entering the building to effectively clean his footwear, especially the sole thereof, to prevent soiling of the building floors.

Another object of the invention resides in providing a machine of the character described, including a plurality of powered rotary brushes arranged in such a manner as to clean the sole and also the top and side of the upper as well as the heel and back side portion of the footwear.

Another object of the invention is to provide a machine of the character described so designed that there is no danger of one's foot being caught in the rotary brushes.

Another object of the invention is to provide a machine of the character described, which is very fast and efficient in operation, the foot wiping operation taking but a few seconds.

Another object of the invention resides in providing a machine of the character described, wherein the rotary brushes are driven in unison by a common belt and pulley system.

The foregoing and other objects of the invention will become more apparent during the following disclosure and by referring to the drawings, in which:

FIG. 1 is a perspective view of the machine and showing how it is used;
FIG. 2 is a partial longitudinal section and showing various positions taken by the user's foot;
FIG. 3 is a plan section of the machine taken along line 3-3 of FIG. 5;
FIG. 4 is a plan section of the machine taken at a higher level than in FIG. 3;
FIG. 5 is a partial vertical section taken along line 5-5 of FIG. 4, and
FIG. 6 is a partial plan section taken along line 6-6 of FIG. 5.

In the drawings, like reference characters indicate like elements throughout.

The machine is contained in a housing 1, shown in FIG. 1, and of generally rectangular shape designed to be positioned upright with a bigger base portion. Housing 1 has side walls 2, a back wall 3, a top wall 4 and a front wall which comprises upper front wall portion 5 and lower front wall portion 6 joined together with a curved front wall portion 7 forming a step and having a front opening 8 for the passage of the user's leg. Opening 8 is of elongated shape with its long axis in a vertical plane and extends through the front curved wall portion 7 and the lower wall portion 6.

Housing 1 is preferably made of plastic material reinforced with glass fibres, if necessary. Housing 1 encloses a framework, made of wood or the like, and which supports the brush system and driving means therefor. The framework is generally indicated at 9 and generally follows the inside contour of housing 1. This framework includes side walls 10, a back wall 11, a top wall 12, an upper front wall portion 13, a lower front wall portion 14 joined to upper front wall 13 by a horizontal portion 15. The framework further includes bottom wall 16 provided with foot pads 17 at the four corners thereof to stand the housing and framework in upright position. Foot pads 17 can be replaced by wheels.

It is noted that the housing 1 has no bottom and is slanted over the framework and is preferably attached thereto by means, not shown. The horizontal portion 15 and lower front wall portion 14 have an opening 18 registering with the foot-receiving opening 8 of housing 1.

Framework 9 supports a plurality of rotary brushes 19, preferably three such brushes, each having a shaft 20 from which the brush bristles protrude, the shaft extending at each end of the brush bristles to be journaled in bearings 21 carried by a part of the framework, as shown, for instance, in FIG. 5, although the bearings could be directly carried by the side walls 10 of the framework. The shafts 20 are horizontally disposed transversely of the framework and housing and at substantially the same level and in the bottom portion of the framework, so that the upper portion of the brush bristles will protrude from the bottom edge of the openings 8 and 18, as clearly shown in FIG. 2. The assembly of the three rotary brushes 19, which are disposed side by side, have a length, crosswise of the brushes, greater than the maximum size of a footwear and these brushes are adapted to brush and clean the sole of a footwear, as clearly shown in FIG. 2. Between each two adjacent brushes is disposed a support member 22 in the form of a strip arranged in a vertical plane extending parallel to the shafts 20, supported at their ends by the side walls of the framework and with their top edge 23 slightly above the top of the shafts 20, as shown in FIG. 2. These strips act as a stop for the wearer's footwear sole to prevent breaking of the brushes in the event a person stands up on the brush assembly.

A pair of additional footwear engaging brushes 24, also of the rotary type, are disposed within the framework 9 above the three brushes 19 and across the same. The brushes 24 have their shaft 25 horizontally disposed and making an acute angle therewith. The shafts 25 converge towards the back wall 11 of the framework and are journaled at their rear ends in bearings 26 supported by the back portion of the framework 9. The front ends of the shaft 25 are similarly journaled in bearings 27 supported by the front end portion of the framework. The line bisecting the angle made by the shafts 25 is substantially perpendicular to the shafts 20 of the brushes 19. The two brushes 24 extend symmetrically with respect to housing opening 8; namely they are at the center of the housing and prefer-
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ably their brush bristles just clear the brush bristles of the brushes 19.

Thus, the user's foot can be inserted through openings 8, 18 with the footware sole bearing against the set of lower brushes 19 and the footware upper engaged at the sides and top by the two converging brushes 24.

The assembly of all five brushes is driven by an electric motor 28, shown in FIG. 4, and mounted on the top wall 12 of framework 9 with its axis substantially at a 45° angle with respect to the shafts 20 of the rotary brushes 19. The electric motor 28 is controlled by a push button switch 29, shown in FIG. 1, carried by housing 1 at the top of front wall portion 5 thereof in a position readily accessible to the user. The shaft of motor 28 carries a pulley 30 while the rear end portion of the shaft 25 of the left-hand brush 24 carries a pulley 31 and the left-hand end portion of the shaft 20 of the rearmost rotary brush 19 carries a pulley 32, which is clearly shown in FIG. 5.

Furthermore, an idle pulley 33 is carried by a bracket 34 adjustable suspended from the top wall 12 of framework 9 by means of a bolt 35 and wing nut 36. A V-belt 37 is trained on pulleys 30 to 33 inclusive, as shown in FIG. 5, with the adjustable idle pulley 33 maintaining the belt 37 sufficiently taut. The orientation of motor pulley 30 is about mid-way between the angle formed by the two pulleys 31 and 32, so as to keep to a minimum the misalignment of the V-belt 37 with the respective pulleys. The belt is trained on the pulleys, considering the direction of rotation of the motor shaft, so that the rearmost rotary brush 19 will rotate with its top portion moving towards the back of the housing and framework, as clearly shown by the arrow 38 in FIG. 2, and so that the left-hand brush 24 will rotate in a clockwise direction when seen from its front end, and so that its portion facing the right-hand brush 24 will move downwardly, as shown in FIG. 2.

The right-hand brush 24 moves in the direction opposite to the left-hand brush 24 and is driven by the latter by means of a pair of intermeshing gears 37 secured to the shafts 25 of the respective brushes 24. These gears 39 are slightly bevelled for proper meshing. They are mounted at the back end portions of the shafts 25, either intermediate the brush bristles and the pulley, or intermediate the pulley 27 and the back bearing 26. As a preferred alternative to the gears 39, friction wheels are provided, for instance, a rubber-lined friction wheel on one shaft 25 in frictional engagement with a metal wheel on the other shaft. This is a less expensive construction and also results in quieter operation.

To decrease the gears or friction wheels diameter, one shaft 25 may be arranged to be shorter than the other shaft, as shown in FIG. 3.

The set of the three lower brushes 19 rotate in the same direction of rotation, namely with their upper portion moving towards the back of the machine. The rearmost rotary brush drives the middle brush, which in turn drives the frontmost brush. To this end, a pulley and belt drive is provided for drivingly interconnecting the rearmost brush 19 and the middle brush 19, as shown at 40 in the right-hand end portion of the shafts 20 (see FIG. 3), while the middle brush is drivingly connected to the frontmost brush by means of a pulley and belt drive 41 at the left-hand end portion of the shafts 20 of these two brushes, as shown in FIG. 3. V-belts and V-grooved pulleys are used.

In operation, the user, shown at A, wearing footwear to be cleaned, simply inserts his foot through openings 8, 18 and rests the sole of his boot, or the like footware B, on top of the three lower rotary brushes 19. He starts the electric motor 24 by pressing on push button 25. The three lower brushes 19 tend to move the wearer's foot towards the back of the machine and thus the upper of the boot, or the like footware, is engaged over the top and sides by the two overlying brushes 24, which effectively prevent further movement of the wearer's foot towards the back of the machine. If desired, a stationary stop (not shown) may be provided to abut the front of the footware and limit its backward movement relative to the housing. The rotating brushes effectively clean the sole, heel and sides and top of the boot or footware upper with the wearer's foot in substantially horizontal position, as shown in full line in FIG. 2. The user then inclines his foot, as shown in dotted line in FIG. 2, whereby the back of the heel and upper can be cleaned by the frontmost rotary brush 19.

A tray 42, in the form of a drawer, removable through a back opening 43 of the housing 1 (FIGS. 2 and 5), is supported by the bottom wall 16 of the framework 9 and serves to collect snow, grit and dirt removed from the footware.

With the machine of the present invention, any kind of soiled footware can be efficiently cleaned, especially the sole and the lower part of the upper thereof, to remove dirt, snow, calcium or other chemicals used in winter on city streets.

Bearings 21, 26, and 27 can be replaced by bushings, preferably bushings made of a material identified by the registered trade mark "Teflon", of The Du Pont of Canada Limited.

What I claim is:

1. A footware wiping machine comprising a housing having a front wall and an opening in said front wall for receiving a user's foot clad with footware, a plurality of rotary brushes journalled in said housing, disposed below the level of said housing opening, in side-by-side relation with their rotational axes substantially parallel and substantially horizontally disposed transversely of said opening, power means to rotate said brushes and wherein said brushes are drivingly interconnected to rotate in the same direction and with their top portion away from said front wall, said brushes adapted to engage and wipe the sole of said footware, and further including a pair of additional rotary brushes disposed above the plurality of brushes with their rotational axes horizontally disposed converging towards the back end of the housing opening to engage the top and sides of the upper of a footware resting on said first-named brushes.

2. A footware wiping machine as claimed in claim 1, wherein said additional brushes are drivingly interconnected to rotate in opposite directions with their inner portions facing each other and moving downwardly towards said first-named brushes.

3. A footware wiping machine as claimed in claim 2, wherein said power means include an electric motor, a first belt and pulley drive including pulleys mounted on the motor shaft, on the shaft of one of said first-named brushes and on the shaft of one of said additional brushes and a V-belt common to all of said pulleys and trained thereon, wheel means mounted on the shafts of the additional brushes and in direct engagement with each other, and a second pulley and belt drive drivingly interconnecting the remaining first-named brushes to said one of said first-named brushes.

4. A footware wiping machine as claimed in claim 3, further including a tighter pulley engaging the belt of said first-named belt and pulley drive.