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SHOE CLEANER

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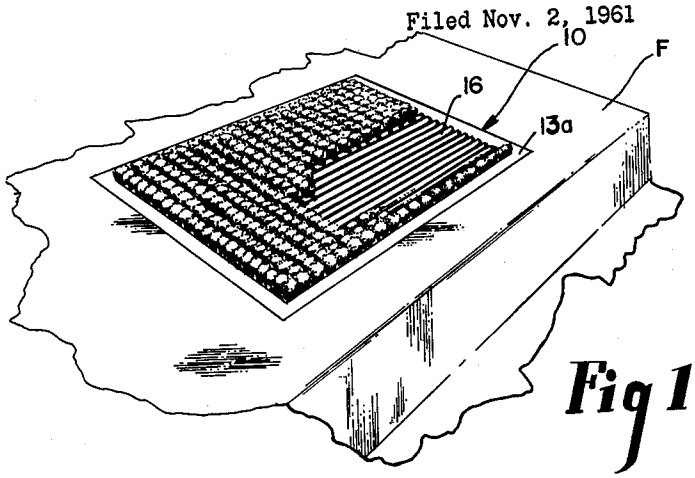


Fig 1

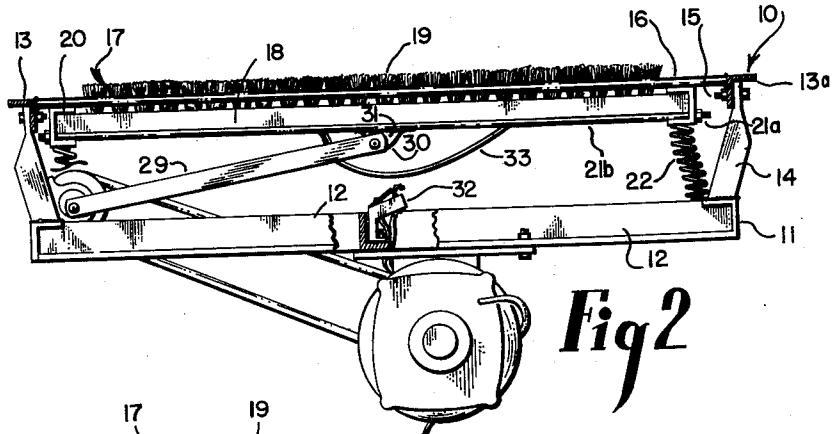


Fig 2

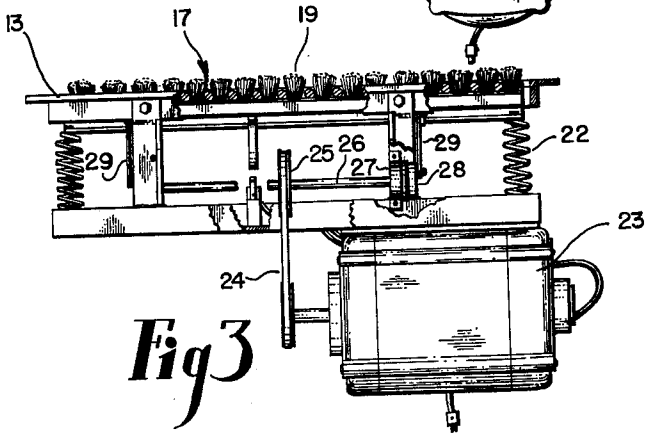


Fig 3

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SHOE CLEANER

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This invention relates to a shoe cleaner and more particularly relates to a power-operated apparatus for cleaning dirt and other foreign materials from the soles of a person's shoes.

Although apparatus of this type have been known in the past, such apparatus have been expensive to install and cumbersome to use.

An object of my invention is the provision of a new and improved shoe-cleaning apparatus of simple and inexpensive construction and operation.

Another object of my invention is to provide a novel shoe-cleaning apparatus which will clean the soles of a person's shoes without requiring any effort on the part of the person having his shoes cleaned.

Another object of my invention is the provision of an improved and novel apparatus which may be readily and easily installed in the floor adjacent a building or room entrance so that as persons walk through the entrance, the soles of the shoes of the person will be cleaned.

These and other objects and advantages of my invention will more fully appear from the following description made in connection with the accompanying drawings wherein like reference characters refer to the same or similar parts throughout the several views and in which:

FIG. 1 is a perspective view of the invention installed in a floor area which may be adjacent an entrance;

FIG. 2 is a side elevation view, partly broken away, showing the apparatus separated from the floor structure; and

FIG. 3 is an end elevation view of the apparatus, being partly broken away and partly shown in section for clarity of detail.

One form of the present invention is shown in the drawings and is described herein. The shoe-cleaning apparatus is indicated in general by numeral 10 and will be mounted in a floor F, and in the present disclosure the floor F is the top step of an entranceway.

The apparatus 10 includes a frame structure 11 having a lower rigid frame portion 12 and an upper rectangular frame portion 13 which is constructed of angle iron material to define an outwardly protruding flange portion 13*a* which will overlie the inner marginal portion of the floor F adjacent an opening therein for receiving the frame 11. The upper rectangular framework 13 is supported from the lower frame 12 by a plurality of rigid support posts or legs 14 which attach the upper rectangular framework 13 in rigid relation to the lower frame 12. The upper rectangular framework defines an enlarged central open area 15, across which extends a plurality of elongate rigid juxtaposed rods 16 which are spaced from each other so as to define a perforate support adapted to carry the weight of a person thereon.

The apparatus 10 also includes a brush 17 which has a generally horizontal and rigid back 18 with a plurality of upwardly projecting bristles 19 affixed thereto and arranged in a plurality of tufts which are oriented in lines and rows. It will be noted that the lines of tufts of bristles 19 are spaced slightly from each other so as to accommodate the rods 16 therebetween as best seen in FIGS. 1 and 3. The brush 17 is supported in U-shaped end frames 20 which are tied together by a pair of rods 21*b* with threaded ends and nuts 21*a* thereon. The end frames 20 are affixed as by bolts at their opposite ends to the upper ends of coil springs 22, the lower ends of which are

secured as by bolts to the bottom frame 12. It will therefore be seen that the brush 17 is yieldably supported so as to be depressed under the weight of a person standing on the upper ends of the bristles 19. It will be noted that the upper rectangular frame 13 is somewhat longer than the brush 17, but the frame 13 is of substantially the same width as the brush 17 so that the brush 17 may reciprocate in a fore-and-aft longitudinal direction and be guided along its sides by the upper rectangular frame 13.

Means are provided for reciprocating the brush 17 in a fore-and-aft direction, and in the form shown, such means includes a motor 23 connected by a belt 24 to the pulley 25 on a shaft 26 which is journalled in the bearings 27 which are affixed to the frame structure 11. The shaft 26 has eccentrics 28 at its opposite ends, and a pair of links 29 are respectively connected to the eccentrics 28 adjacent the opposite sides of the brush 17 and the links 29 are also pivotally connected at 30 to ears 31 which are welded to the rods 21. It will be seen that by virtue of the substantially horizontally extending links 29 which interconnect the eccentrics and the brush 17, depression of the brush at either side or in its entirety under the weight of a person standing on the bristles will not adversely affect the operation of the drive mechanism for causing reciprocation of the brush in a fore-and-aft direction when the motor 23 is operated.

The apparatus is also provided with means responsive to depression of the brush 17 for operating the motor 23. In the form shown, such means includes a switch element 32 and a switch-operating element 33. The switch element 32 is a conventional type of microswitch and is affixed to the lower frame 12 and is disposed substantially midway between the opposite ends of the brush 17 and also approximately midway between the opposite sides of the brush. The switch-operating element 33 comprises an elongate flexible, but resilient strip of spring steel extending in the fore-and-aft direction of reciprocation and having its opposite ends affixed to the lower side of the brush backing 18. The switch-operating element 33 is in vertically spaced relation with the switch element 32 so as to move downwardly into engagement with the switch element for operating the same when the brush 17 is depressed. It will be noted that is a result of the resiliency and flexibility of the switch-operating element 33, the element 33 will remain in engagement with the switch element 32 during normal reciprocation of the brush 17 because the switch-operating element 33 will flex and will continue to flex as it moves back and forth across the switch element 32. If the weight of the person is applied to any portion of the brush or top of the bristles as seen in FIG. 1, the switch element 32 will be operated so as to start the motor and produce the fore-and-aft reciprocation. When the brush 17 is depressed under the weight of a person standing thereon, the upper ends of the bristles, which are normally disposed above the rods 16 as shown in the drawings, will move downwardly so as to be substantially flush with the top of the rods, whereupon the weight of the person is supported by the rods and the fore-and-aft reciprocation of the brush and its bristles causes cleaning of the soles of the shoes of the person standing on the rods. Of course, the springs 22 continue to urge the brush upwardly into engagement with the soles of the shoes so that thorough cleaning is effected even though the person merely steps on the bristles as he is walking across.

It will be understood that the opening in the floor F is deep enough to accommodate the entire frame 11 and the motor 23. The opening in the floor may also be large enough to accommodate an air conduit which may be connected to a suction fan for drawing the dirt swept from the soles of the person's shoes downwardly into a

collecting bag or other container in a vacuum cleaner-type operation.

It will, of course, be understood that various changes may be made in the form, detail, arrangement and proportion of the parts without departing from the scope of my invention which consists of the matter described herein and set forth in the appended claims.

What I claim is:

1. A shoe-cleaning apparatus to be mounted in a floor, said apparatus comprising a frame having a perforate stationary support affixed thereto and disposed substantially at the elevation of the floor for supporting the weight of a person, a brush having a generally horizontal and rigid back disposed below said support and also having a plurality of upwardly projecting bristles extending through the perforate support and projecting thereabove, resilient means supporting said brush on the frame and permitting limited downward yielding of the brush when the weight of a person is applied thereto, means driving and guiding said brush in fore-and-aft reciprocation and including a source of power, a switch element connected with said source of power for operating the same, a switch-operating element, one of said elements being mounted on the brush and the other of said elements being mounted on the frame, said elements being disposed in vertically spaced relation with each other for engaging each other and operating the switch element when the weight of a person on the bristles depresses the brush and to thereby operate the source of power and cause reciprocation of the brush while the weight of the person is carried on said perforate support.

2. A shoe-cleaning apparatus to be mounted in a floor, said apparatus comprising a frame defining an enlarged central open area with a plurality of juxtaposed support rods extending across the open area of the frame, and being disposed substantially at the elevation of the floor, a brush having a rigid and generally horizontal back disposed below said rods and also having a plurality of upwardly projecting bristles extending upwardly between the rods for engaging the shoes of a person standing on the bristles and rods, resilient means supporting said brush on the frame and permitting limited downward yielding of the brush when the weight of a person is applied thereon and causing the weight of the person to be transferred to said rods, means driving and guiding said brush in fore-and-aft reciprocation parallel to said rods and including a source of power, a switch element connected with said source of power for operating the same, a switch-operating element, one of said elements being mounted on the brush and the other of said elements being mounted on the frame, said elements being disposed in vertically spaced relation with each other for engaging each other and operating the switch element when the brush is depressed under the weight of a person and thereby operating the source of power to cause reciprocation of the brush and cleaning of the person's shoes as the person is supported by said rods.

3. A shoe-cleaning apparatus to be mounted in a floor, said apparatus comprising a frame having a perforate stationary support affixed thereto and disposed substantially at the elevation of the floor for supporting the weight of a person, a brush having a generally horizontal rigid back with upwardly projecting bristles thereon and projecting through the perforate support, resilient means supporting said brush on the frame with the bristles substantially disposed at the elevation of the floor and permitting downward yielding of the brush when the weight of a person is applied thereon, means driving and guiding said brush in fore-and-aft reciprocation and including a source of power, a switch element connected with said source of power for operating the same, an elongate switch-operating element extending in said fore-and-aft direction, one of said elements being mounted on the brush and the other of said elements being mounted on the frame, said elements being disposed in vertically spaced relation with each other for engaging each other and causing the switch element to be operated and for operating said source of power and cause reciprocation of the brush when the brush is depressed under the weight of the person, and said switch-operating element maintaining said switch in operated condition during reciprocation of the brush.

4. A shoe-cleaning apparatus to be mounted in a floor, said apparatus comprising a frame having a perforate stationary support affixed thereto and disposed substantially at the elevation of the floor for supporting the weight of a person, a brush having a rigid and generally horizontal back with upwardly projecting bristles thereon, resilient means supporting said brush on the frame with the bristles substantially disposed at the elevation of the floor and permitting limited downward yielding of the brush when the weight of a person is applied thereon, means driving and guiding said brush in fore-and-aft reciprocation and including a source of power, a switch element connected with said source of power for operating the same, an elongate resilient flexible switch-operating element extending in said fore-and-aft direction and being normally vertically spaced from said switch element, said elements being mounted on the frame and brush respectively for engaging each other and operating the switch element when the brush is depressed under the weight of a person on the bristles, said resiliently flexible switch-operating element yielding when in engagement with the switch element and remaining in engagement therewith during the entire reciprocating movement of the brush.

5. The invention set forth in claim 4 wherein said brush has opposite fore-and-aft ends, said switch element being mounted on the frame substantially midway between said ends, and said flexible switch-operating element being mounted on the brush, said resilient means including a plurality of coil springs supporting each of the ends of the brush at opposite sides thereof from the frame, whereby to cause reciprocation of the brush regardless of the position at which the weight of a person is applied onto the brush.

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