Dec. 13, 1960 J. J. NAPPI 2,963,723

SHOE CLEANING DEVICE

Filed May 17, 1957 2 Sheets-Sheet 1

FIG. 1.

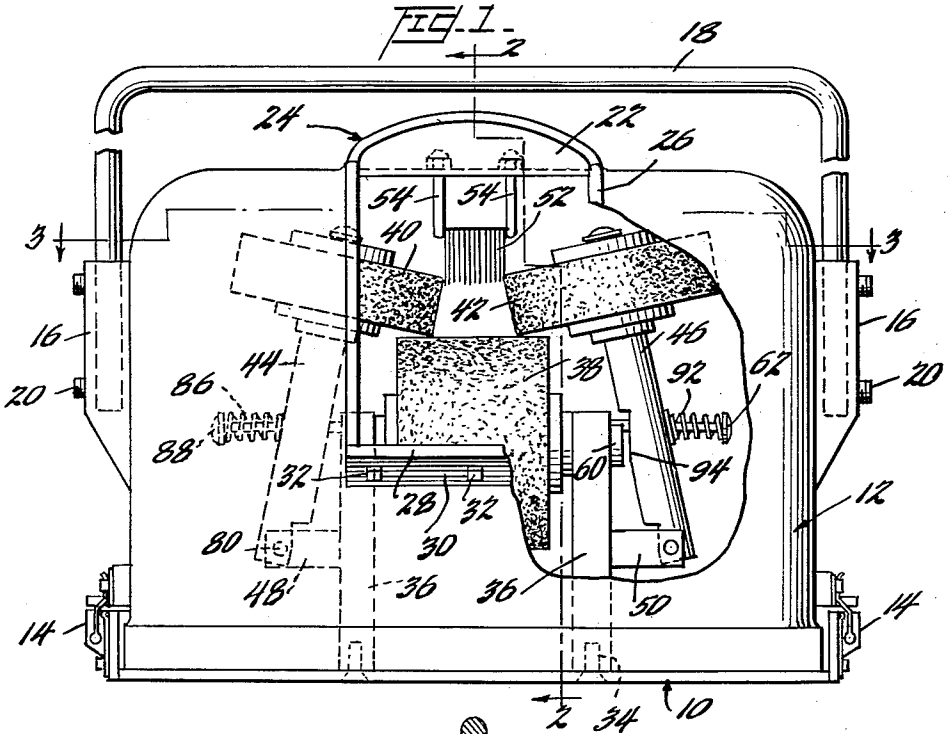
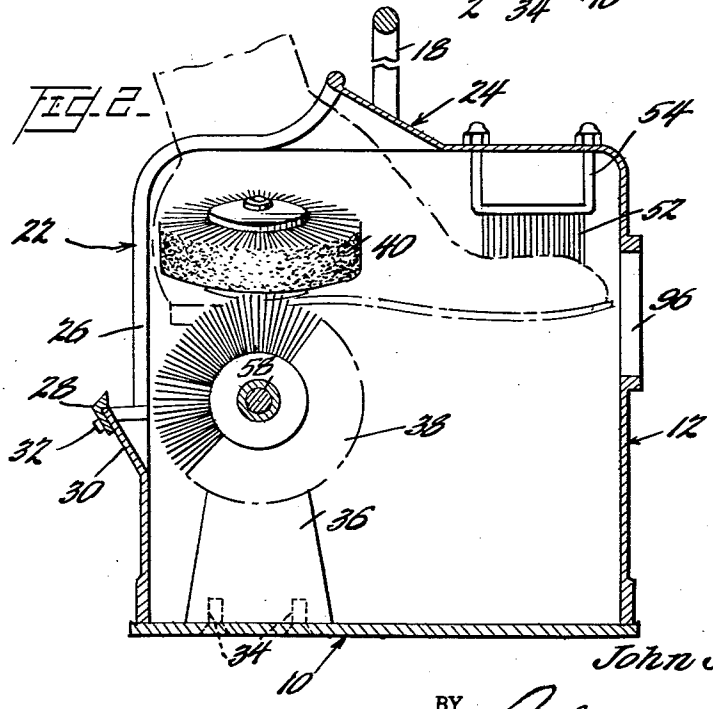


FIG. 2.



INVENTOR

John J. Nappi,

BY Parker and Walsh.

ATTORNEYS

Dec. 13, 1960 J. J. NAPPI 2,963,723

SHOE CLEANING DEVICE

Filed May 17, 1957 2 Sheets-Sheet 1

FIG. 1

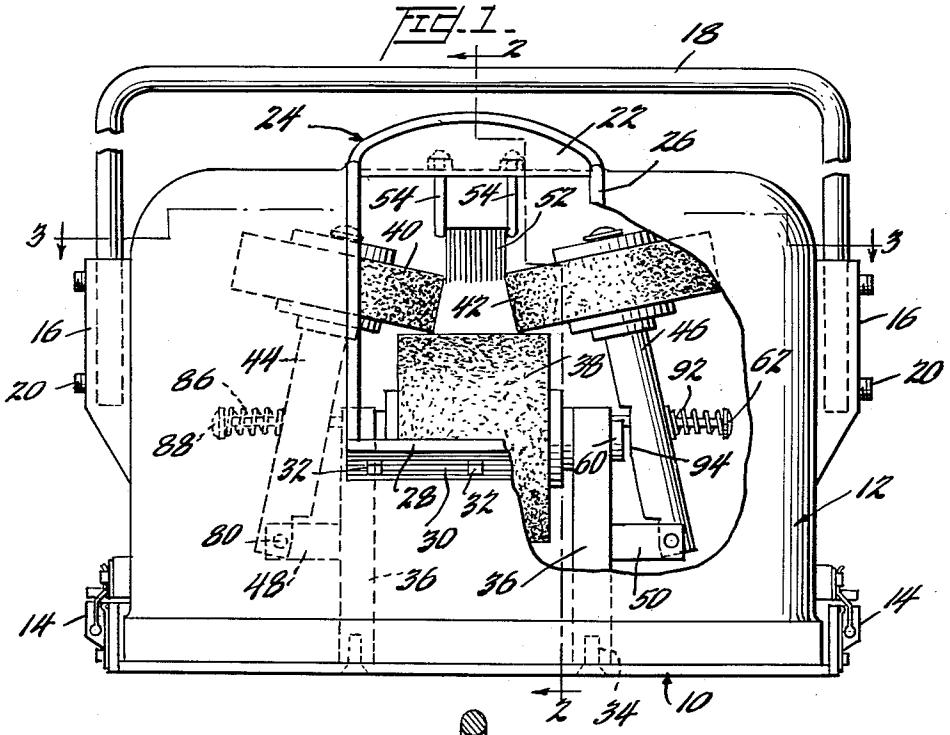
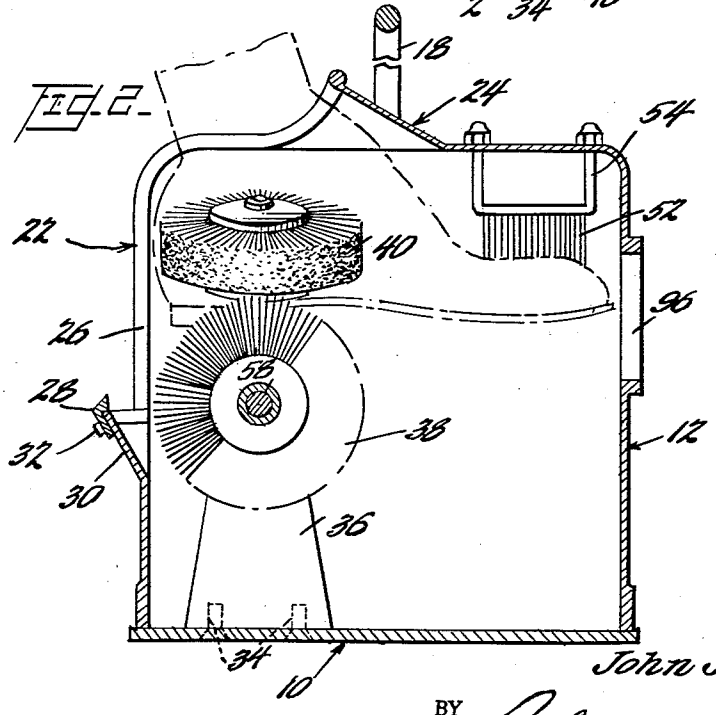


FIG. 2



INVENTOR

John J. Nappi,

BY Parker and Walsh.

ATTORNEYS

United States Patent Office 2,963,723 Patented Dec. 13, 1960

2,963,723

SHOE CLEANING DEVICE

John J. Nappi, 297 Seymour Road, Berlin, Conn.

Filed May 17, 1957, Ser. No. 659,901

3 Claims. (Cl. 15—36)

This invention relates to a shoe cleaning device and more particularly to a device which utilizes the motion of the user's feet to perform its functions and which does not require its own source of power.

Shoe cleaning devices which utilize brushes for cleaning the various aspects of a shoe are well known. In general such prior art devices utilize brushes which are either fixed or power driven. In the former case, the user may simply move his shoe against the brushes to accomplish the cleaning, while in the latter case, the shoe may be simply held fixed against the power driven brushes. Devices of the first class are generally inefficient, presenting the same brushing surface to the shoe at all times, which results in undue wear of and quick contamination of the brushes. Devices of the second class are expensive and complicated.

The present invention provides a device which differs from power driven devices in that it does not require its own source of power and which differs from fixed brush devices in that the brushes are not always fixed and do not present the same working surface at all times. It is accordingly a principal object of the invention to provide a device having these characteristics and advantages.

A further object of the invention is to provide a device of the aforesaid type that is sturdy and capable of long trouble-free use, that is compact and readily portable, and that is more efficient than comparable devices of the prior art.

A further object of the invention is to provide a device incorporating brushes which operate in accordance with a novel shoe cleaning principle, to wit, compliance with the movement of a shoe in a first direction and resistance to the movement in a second direction.

Yet another object of the invention is to provide a device of the aforesaid type that ensures adequate cleaning of the under and side surfaces of a shoe, which normally are subject to the greatest accumulation of dirt, and which cleans the upper surface of the shoe as well.

A still further object of the invention is to provide a device of the aforesaid type that is self-contained and yet readily exposed for servicing.

An additional object of the invention is to provide a device of the aforesaid type that permits the ready disposal of dirt removed from the shoes.

These and other objects of the invention will become more readily apparent upon consideration of the following detailed description of an exemplary embodiment of the invention taken in conjunction with the accompanying drawing illustrating such embodiment and wherein:

Figure 1 is a front elevation view of the invention partly broken away to show the relationship of the working parts;

Figure 2 is a vertical sectional view taken along line 2—2 of Figure 1 in the direction of the arrows;

Figure 3 is a horizontal sectional view taken along line 3—3 of Figure 1 in the direction of the arrows;

Figure 4 is a vertical sectional view illustrating the working relationship of certain of the parts of the invention;

Figure 5 is a sectional view of a detail of the invention taken along line 5—5 of Figure 4 in the direction of the arrows; and

Figure 6 is another sectional view of a detail of the invention taken along line 6—6 of Figure 4 in the direction of the arrows.

Briefly stated, the invention comprises a base which supports a plurality of brushes enclosed in a housing that is detachably connected to the base and provided with a handle so that the entire unit may be readily carried. The housing has an opening into which the shoe to be cleaned is inserted and by virtue of which the shoe may be engaged with the brushes in the housing. These brushes include a first brush arranged to engage the bottom of the shoe and second and third brushes on opposite sides of the first brush and arranged to engage the sides of the shoe. The brushes are mounted so that they may rotate as the shoe is moved in a first direction but will be prevented from rotating as the shoe is moved in a second direction. An additional brush is provided to engage the upper surface of the shoe, and a scraper is provided to remove unusually large deposits of dirt.

Referring to the drawing, reference numeral 10 designates a base which supports a housing 12 and the working parts of the invention which are enclosed within the housing. The housing may be detachably secured to the base through the use of suitable fastenings, such as conventional valise fastenings 14 which have cooperating parts secured to blocks fixed to the base and the housing, respectively. The housing also has tubular projections 16 which receive the ends of a U-shaped handle 18 secured in the projections as by set screws 20. The housing is provided with an opening 22 which extends from about the middle of the front wall of the housing upwardly over the upper front corner of the housing into the top of the housing, as shown. The top of the housing may be bulged outwardly as indicated at 24 to accommodate the instep of a shoe, which may be inserted as indicated by the phantom lines in Figure 2. The rim of opening 22 may be smoothed and strengthened by a bead 26, the lower extremity of the opposite legs of the bead helping to support a scraper blade 28 that is mounted on an outwardly turned lip 30 of the opening 22, as by a plurality of machine screws 32. The scraper blade may be utilized to remove excessive deposits of dirt from the shoe before the shoe is inserted within the housing 12.

Secured to the base 10 within the housing 12, as by a plurality of machine screws 34, are a pair of spaced upright brackets 36. A first brush 38 is mounted between brackets 36. This brush is located to engage the bottom of the shoe when it is inserted as shown in Figure 2. Second and third brushes 40, 42 are located above and to the sides of brush 38 to engage the side surfaces of the shoe. These brushes are mounted on shafts 44 and 46, respectively, which are in turn mounted on yokes 48 and 50 fixed to brackets 36. A fourth brush 52 is suspended in housing 12, as by U-bolts 54, and is located to engage the upper surface of the shoe. While the previously mentioned brushes are movable in a manner to be described, brush 52 may be stationary, because the top surface of the shoe seldom collects much dirt.

Brushes 38, 40 and 42 are supported for rotation about their respective axes in a first sense but are prevented from rotating in the opposite sense. The manner in which this may be accomplished is illustrated in Figure 4. Brush 38 has its peripheral bristles mounted on a hub 55, in turn supported on a shaft 58 by sleeves 56, which are driven tightly into the hub from opposite ends so as to be fixed thereto. Sleeves 56 are provided

with enlarged end portions 57 which serve as washers between the brush and brackets 36. Shaft 58 may have a head 60 at one end and be threaded into one of the brackets 36 at the other end as indicated at 62'. Once shaft 58 has been inserted through the brackets 36 and the sleeves 56 threaded into place, it is prevented from rotating about its axis by a bolt 62 which passes through a slot in the head of the shaft and which serves an additional purpose to be described.

The shaft 58 is provided with longitudinal wedge-shaped grooves 64, as shown in Figures 4 and 6. These grooves are provided with pins 66 which are received loosely enough within the grooves to allow them to move to opposite lateral extremities of the grooves. Grooves 64, pins 66 and sleeves 56 constitute a one-way engaging clutch of conventional type. As is well known, pins 66 wedge between shaft 58 and sleeve 56 when the sleeves are moved in one rotational sense with respect to the shaft, thereby coupling the shaft and the sleeves, but merely slide or roll when the sleeves are moved in the opposite rotational sense, thereby allowing the sleeves to be rotated with respect to the shaft.

As further shown in Figure 4, brush 40 has its bristles mounted on a hub 68 fixed to a sleeve 70 similar to the sleeves 56 described in conjunction with brush 38. The end of shaft 44 is of reduced diameter and is provided with longitudinal wedge-shaped grooves 72, as shown in Figures 4 and 5. Each of these grooves is provided with a pin 74, the arrangement being similar to that for brush 38. The grooves 72, pins 74, and sleeve 70 constitute a one-way engaging clutch which allows brush 40 to rotate in a first sense but which prevents the brush from rotating in the opposite sense. The brush is held on the end of shaft 44 by a washer 76 secured to the end of the shaft by a machine screw 78.

Shaft 44 is pivotable in substantially the vertical plane of the axis of brush 38 about a pin 80, which bridges the arms of yoke 48. The lower end of the shaft may be notched as shown at 82 to allow freedom of movement of the shaft toward the adjacent bracket 36, on which yoke 48 is fixed as by machine screws 84. Shaft 44 is urged toward the adjacent bracket 36 and brush 38 by a spring 86 that is slipped over a bolt 88 which passes through an elongated slot 90 in shaft 44 and is threaded into the upper extremity of the adjacent bracket 36. Bolt 88 complements the bolt 62 previously described in conjunction with the mounting of brush 38, and as shown in Figure 1, bolt 62 is provided with a spring 92 which urges shaft 46 of brush 42 toward the adjacent bracket 36 and brushes 38 and 40. The mounting of brush 42 is substantially identical to the mounting of brush 40 and need not be described in detail. Shaft 46 may be notched as shown at 94 to provide clearance with respect to the head 60 of the shaft which supports brush 38.

In the use of the device of the invention, large deposits of dirt are removed from the bottom and/or sides of the shoe by rubbing the shoe over the scraper blade 28. The shoe is then inserted through opening 22 into engagement with the brushes. The opening is aligned with the brushes, so that the shoe passes over brush 38, between brushes 40 and 42, and under brush 52. In the preferred mode of operation, as the shoe is inserted within housing 12, brushes 38 and brushes 40 and 42 rotate about their respective axes in compliance with the motion of the shoe. Top brush 52 merely remains stationary. It should be noted at this point that as the shoe is inserted (and later when it is withdrawn), the axes of brushes 40 and 42 move about their pivots at the lower extremities of shafts 44 and 46 against the bias of springs 86 and 92, so that the brushes exert pressure against the sides of the shoe and at the same time follow the contour of the shoe. When the shoe is withdrawn from the housing, brushes 38, 40 and 42 tend to rotate in the sense opposite to which they rotated upon insertion of the shoe, but are prevented from such rotation by action of the one-way engaging clutches incorporated in the mounting of the brushes. Thus, the brushes remain fixed as the shoe is withdrawn, resisting the movement of the shoe from the housing and exerting a thorough cleaning action on the corresponding surfaces of the shoe. If the shoe is very dirty, it may be inserted and withdrawn repeatedly until the necessary cleaning has been obtained, but a single insertion and withdrawal will usually suffice.

With the construction described, the shoe is easily inserted within the device to the maximum limit of insertion, at which point the brushes are in position to exert optimum cleaning action, and, in fact, the shoe cannot be withdrawn without the performance of the brushes in the desired manner. If the brushes were held fixed as the shoe was inserted and allowed to rotate as the shoe was withdrawn, there would be a tendency to accede to the resistance of the apparatus by not inserting the shoe to the maximum desired degree. Such action is prevented by the preferred construction.

Since the brushes are rotated as the shoe is inserted, any dirt held by the brushes from a previous cleaning will be moved away from the newly inserted shoe and fresh cleaning surface will be presented continuously. Furthermore, the rotation of the brushes allows a much greater total cleaning surface than would be possible with fixed brushes of the same compact construction.

In the normal operation of the invention, the bristles of the brushes are flexed by engagement with the shoe, and when the shoe is withdrawn, the bristles snap back by virtue of their inherent resiliency and thereby dislodge collected dirt and throw the same into the housing. While not illustrated in the drawing, scraper blades or combs may be fixed adjacent the respective surfaces of the brushes away from the working area, so that the brushes may be additionally cleaned as they are rotated.

The dirt removed by the brushes adds to the dirt removed by the scraper, the latter dirt falling into the housing by virtue of the mounting of the scraper on the lower edge of the access opening in the housing. The debris that is removed from the shoes may be allowed to collect at the bottom of the housing 12 but instead may be conveniently removed from the housing by connecting the hose of a vacuum cleaner or cleaning system to a coupling 96 provided at the rear of the housing as shown in Figures 2 and 3. A rubber gasket (not shown) is preferably placed between the housing and the base to ensure a tight seal.

The brushes illustrated in the exemplary embodiment are substantially cylindrical in configuration, having bristles around their peripheries which extend substantially radially from the respective axes of the brushes. While such brushes are preferred, it is to be understood that modified forms of brushes may be utilized. Moreover, if desired, the brush which cleans the upper surface of the shoe may be constructed similar to the brush which cleans the lower surface, rather than as shown.

It will be noted that all of the movable brushes have a unitary mounting, which may be easily disassembled from the base for brush servicing or replacement. Moreover, the brushes are readily exposed by simply detaching the housing from the base. The entire unit is easily carried by its handle. The handle is preferably high enough to allow it to be grasped by the user and aid in maintaining balance when one foot is raised from the floor during cleaning.

While a preferred embodiment of the invention has been shown and described, changes may be made in this embodiment without departing from the principles and spirit of the invention, the scope of which is defined in the appended claims. Accordingly, the foregoing embodiment is to be taken as illustrative, rather than restrictive of the invention, and those modifications which come within the meaning and range of equivalency of the claims are included therein.

I claim:

1. A shoe cleaning device comprising a housing, a base within said housing, a pair of spaced brackets mounted upright on said base, a first cylindrical brush, means rotatably supporting said brush between said brackets about a horizontally disposed axis for rotation in a sense yielding to the movement of the shoe upon insertion of the shoe but preventing rotation in the opposite sense, second and third cylindrical brushes adjacent said brackets, means rotatably supporting said second and third brushes about generally vertical axes, for rotation in a sense yielding to the movement of the shoe upon insertion of the shoe but preventing rotation in the opposite sense and means resiliently urging said second and third brushes together, said housing enclosing the brushes at least at the sides and the end opposite that for insertion of the shoe and so much of the top and front as is not required for the insertion of a shoe.

2. The device of claim 1, wherein said supporting means for the first brush comprises a shaft fixed between said brackets and a one-way engaging clutch coupling said brush and said shaft.

3. The device of claim 2, wherein said supporting means for said second and third brushes comprises a pair of upwardly directed shafts mounted near their lower

extremities on said brackets, respectively, for pivotal movement about horizontal axes transverse to the axis of the first brush, said shafts having one-way engaging clutches near their other extremities coupling said second and third brushes thereto, respectively, and wherein said urging means comprises springs engaging said shafts and biasing them toward convergence at the last-mentioned extremities.

References Cited in the file of this patent

UNITED STATES PATENTS

825,512	Brandes	July 10, 1906
868,351	Magidson	Oct. 15, 1907
965,176	Geraldson	July 26, 1910
1,044,762	Dupuis	Nov. 19, 1912
1,335,388	Raginia	Mar. 30, 1920
1,471,826	Bzowy	Oct. 23, 1923
2,428,476	Thielen	Oct. 7, 1947
2,565,894	Stotz	Aug. 28, 1951

FOREIGN PATENTS

2,965	Great Britain	Feb. 7, 1906
3,871	Great Britain	July 5, 1890
163,235	Switzerland	Oct. 2, 1933