

(51) International Patent Classification:

A47L 23/00 (2006.01) A47L 23/26 (2006.01)

(21) International Application Number:

PCT/IN2017/050562

(22) International Filing Date:

01 December 2017 (01.12.2017)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

201711036693 16 October 2017 (16.10.2017) IN

(72) Inventor; and

(71) Applicant: GUPTA, Mahesh [IN/IN]; H-35, South Extension, Part-I, New Delhi 110049 (IN).

(74) Agent: SRIHARI, Saragur, Kasturirangan et al.; K & S PARTNERS, Intellectual Property Attorneys, 109, Sector 44, National Capital Region, Gurgaon 122003 (IN).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME,

MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

(54) Title: SHOE SOLE CLEANER

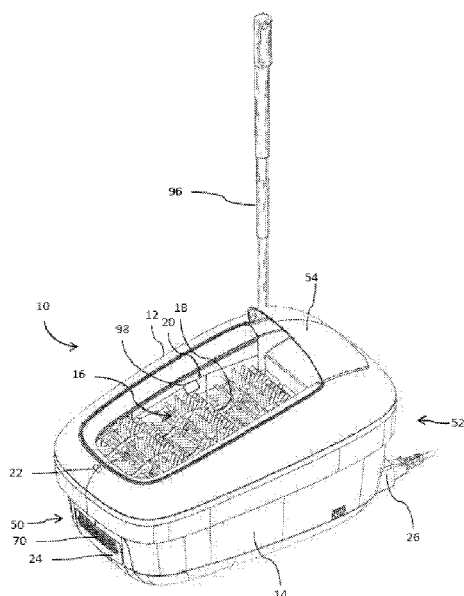


FIG. 1

(57) Abstract: The present invention provides a shoe sole cleaner (10) that can be used to clean and disinfect the shoes worn by a person. The SSC (10) may have a housing (14) to house all the other components of SSC (10). The SSC (10) may further have a brush assembly (16) to clean the sole of the shoe. The SSC (10) may further have a removable dust collector (24) to collect the dust. The SSC (10) is configured such that it will automatically activate when a person steps on the shoe rest (18), and deactivates when the person steps off, thus provides for cleaning of shoes without the need for people to remember to turn it on.



“SHOE SOLE CLEANER”

Technical Field

The present invention relates to an electric shoe cleaner which can be used to
5 remove dirt/mud from sole of the shoe and collecting the dirt in an easily removable container.

Background

When entering residences and commercial venues, there is an ever growing need
10 to clean the feet of residents and visitors. Occupants of residences or commercial places such as hospitals and research centres continually need to make sure that visitors' and residents' feet and shoes are clean before entering to prevent dirty carpets and flooring. The same holds true with many commercial venues. Further in some offices/ houses, shoeless zones are created to avoid mud /dirt coming in
15 from outside to inside.

Traditionally there are multiple solutions that are used to avoid spread of mud/dirt from shoes, for example door mat, floor mat, electrical cleaners with brush, etc. Further in some offices/ houses shoeless zones are created to avoid mud /dirt
20 coming in from outside to inside. However, the above-mentioned solutions are not affective and dirt/mud along with bacteria etc gets carried inside room/house/offices/buildings.

Additionally, there is a growing need for people to become more aware of their
25 own and visitors' personal hygiene. We are constantly reminded of how important it is to wash our hands as often as possible, and with the advent of impending pandemic problems, such as Avian Flu, people must also be aware of their wearing apparel and especially their footwear. At times sole of the shoes might carry one or multiple of bacteria, toxins, dirt, mud etc. Traditionally there are multiple
30 solutions are used to avoid spread of mud/dirt from shoes, such as door mat, floor mat, electrical cleaners with brush, etc. However, the said mentioned solutions are not affective and dirt/mud along with bacteria etc gets carried inside room/house/offices/buildings.

There are shoe cleaners known for cleaning the shoe soles. However, the shoe cleaners known in the art are not convenient to use. The conventional shoe cleaners spread dust and dirt after scrapping the from the shoe sole. Further, the
5 conventional shoe cleaners do not operate automatically and require manual intervention for starting or operating operation of the shoe cleaner. Also, the dust removed from the shoe cleaners often gets scattered and suspended in surrounding atmosphere. Furthermore, the shoe cleaners as known in the art are not easy to clean and may require considerable time and effort for cleaning the shoe cleaner.
10 Also, the conventional shoe cleaners are noisy to operate.

The present invention provides solution to the above mentioned problems and other related problems.

15 **Summary**

The present invention provides a shoe sole cleaner that can be used to clean and disinfect shoes worn by a person. The shoe sole cleaner may have of a top cover body to house all the machine parts and also provide operational control on top/side of the body. The shoe sole cleaner may further have a brush assembly to scrap off
20 mud or dirt to clean the sole of the shoe. A vacuum pump is provided to collect the mud and dirt removed from the sole of the shoe to prevent the dirt from being scattered around. The shoe sole cleaner may further have a removable dust collector to collect the dust or dirt sucked by the vacuum pump. The dust collector may be removed for disposing off the muck and dirt collected form the shoe sole.
25 The shoe sole cleaner is adapted such that it will automatically activate when a person steps on the shoe sole cleaner for cleaning and disinfecting shoe sole surface, and deactivate when the person steps off. This way the shoe sole cleaner provides for disinfecting of people without the need for them to remember to turn it on. The shoe sole cleaner may also have an ON/OFF SWITCH to switch ON or
30 OFF the shoe sole cleaner.

Present disclosure provides for a shoe sole cleaner (SSC). The SSC has a shoe rest for placing a shoe, a brush assembly having a plurality of rollers with bristles for

cleaning a sole of the shoe, a motor coupled with the brush assembly. The motor is configured to run the brush assembly to scrap off dirt from a sole of the shoe. A dust collector is provided to collect the dirt removed from the sole of the shoe. A vacuum pump draws the dirt removed from the shoe towards the dust collector.

5 Further, a HEPA (High Efficiency Particle Arrestor) filter is situated between the vacuum pump and the dust collector to prevent the dirt from escaping the dust collector. A sensor is configured to detect placement of a shoe on the shoe sole cleaner, and an electronic control unit is coupled with the sensor, the motor and the vacuum pump. The electronic control unit is configured to run the motor and the

10 vacuum pump for cleaning sole of the shoe on detection of placement of shoe on the shoe rest.

In an aspect, the sensor is configured to detect absence of shoe from the shoe rest and the ECU is configured to switch off the motor and the vacuum pump on

15 detection of absence of shoe.

In an aspect, the shoe rest, the sensor, the brush assembly, the dust collector, the motor, the vacuum pump and the HEPA filter are mounted in a housing.

20 In an aspect, the sensor is a proximity sensor.

In an aspect, the SSC further has a gear assembly to transmit rotary power from the motor to the brush assembly.

25 In an aspect, the shoe rest is made of two parallel rods extending along the longitudinal length of the shoe sole cleaner.

In an aspect, the shoe rest is made of metallic rods.

30 In an aspect, the shoe rest is supported at its two ends by a first support member and secured in place between a top cover and a third support member.

In an aspect, there are three rollers with bristles.

In an aspect, the plurality of rollers are supported by a first support member at one end and by the gear assembly at other end.

- 5 In an aspect, the gear assembly has a plurality of spindles to support the other end of the plurality of rollers.

In an aspect, the SSC further has a status indicator coupled to the ECU to indicate the status of the shoe sole cleaner.

10

In an aspect, the status indicator is a LED.

In an aspect, the SSC further has a shroud in the top cover to collect the dirt thrown off from the brush assembly.

15

In an aspect, the shoe sole cleaner has a UV lamp for disinfection of sole of shoe.

In an aspect, the shoe sole cleaner has a music player for running music during operation of the shoe cleaner.

20

In an aspect, the shoe sole cleaner has a safety device for supporting a user using the shoe sole cleaner.

In an aspect, the shoe sole cleaner has a trolley handle for facilitating transportation of the shoe sole cleaner.

25

In an aspect, the shoe sole cleaner is equipped with a card/coin machine to facilitate pay and use for a user.

- 30 In an aspect, the SSC has a display panel configured to provide instructions to a user for using of the shoe cleaner.

In an aspect, the SSC has a shoelace sensor to detect presence of shoe laces on the brush assembly and the ECU is configured to switch off the shoe cleaner on detection of shoe laces on the brush assembly.

- 5 In an aspect, the SSC has a polishing mechanism to clean and shine the toe cap/throat/vamp and other top parts of a shoe.

In an aspect, the SSC has a fragrance dispenser.

- 10 In an aspect, the safety device is a handle.

Brief Description of Drawings

- Further aspects and advantages of the present disclosure will be readily understood from the following detailed description with reference to the accompanying
15 drawings, where like reference numerals refer to identical or similar or functionally similar elements. The figures together with the detailed description below, are incorporated in and form part of the specification, and serve to further illustrate the aspects/embodiments and explain various principles and advantages, in accordance with the present disclosure wherein:

20

FIG. 1 illustrates a perspective top view of the shoe sole cleaner, according to an embodiment of the present disclosure.

FIG. 2 illustrates an exploded view of the shoe sole cleaner, according to an embodiment of the present disclosure.

- 25 FIG. 3 illustrates a cross-sectional view of the shoe sole cleaner, according to an embodiment of the present disclosure.

Detailed Description

- In the present disclosure, the terms “comprises”, “comprising”, or any other
30 variations thereof, are intended to cover a non-exclusive inclusion, such that a setup, device that comprises a list of components does not comprise only those components but may comprise other components not expressly listed or inherent to such setup or device. In other words, one or more elements in a system or

apparatus proceeded by “comprises... a” does not, without more constraints, preclude the existence of other elements or additional elements in the system or apparatus.

- 5 FIG. 1 illustrates a perspective view of the shoe sole cleaner, hereinafter referred to as SSC (10), according to an embodiment of the present disclosure. As shown in FIG. 1, the SSC (10) may have a top cover (12), a housing (14), brush assembly (16), a shoe rest (18), a sensor (20), a status indicator (22), a dust collector (24) and a power port (26). Further, as shown in FIG. 2, the shoe cleaner may further have
10 a gear assembly (28), a motor (30), a vacuum pump (32), an exhaust cover (34) and an electronic control unit (36).

Referring to FIGS. 1 and 2, the housing (14) and the top cover (12) are configured to support other components of the SSC (10). The housing (14) may have other
15 sub-components as suitable for supporting various components of the SSC (10). For example, the SSC (10) as shown in FIG. 2 has a first support member (38) and a second support member (40) for supporting components such as brush assembly (16), a gear assembly (28), etc. Further, a third support member (42) is provided that covers the motor (30) of the SSC (10). Other sub-components may be provided
20 in the housing (14) for supporting various components in the SSC (10), as required. The housing (14), the top cover (12), the first support member (38), the second support member (40) and the third support member (42) may have required dimensions or provisions such as grooves, contours, slots etc to support the other elements or components of the SSC (10). The housing (14), the top cover (12), the
25 first support member (38), the second support member (40) and the third support member (42) may be made of any suitable material such as, metal or any other polymeric material as suitable.

The shoe rest (18) is configured to provide a support to a shoe of a user. For
30 simplicity, the term shoe is used generally to refer to any foot wear such as shoes, slippers, etc. In the embodiments as shown, the shoe rest (18) is made of a metallic rod that is adapted to provide two parallel rods for supporting the shoe. The two parallel rods extend along the longitudinal length of the SSC (10). The shoe rest

(18) is supported at its two ends in the SSC (10) by the first support member (38) of the housing (14) and secured in place between the top cover (12) and the third support member (42) as shown in FIG. 3. Necessary grooves or slots are provided in the first support member (38) and third support member (42) to adequately support and secure the shoe rest (18) in the SSC (10). The shape and form of the shoe rest (18), i.e. substantially two parallel rods extending along the longitudinal length of the SSC (10), is adapted to provide adequate support to different sizes of a shoe. Also, the shape and orientation of the rods ensure adequate freedom for rotary movement of the bristles (46) and rollers (44) of the brush assembly (16).

10

The brush assembly (16) includes brushes with rollers (44), and each roller has bristles (46) of a length fixed around the cylindrical periphery of the rollers (44). In the embodiment as shown, three rollers (44) are provided. In an alternate embodiment, any numbers or size of brushes may be used in the brush assembly (16), as required. The brush assembly (16) is arranged in the SSC (10) such that, when the rollers (44) are in place, a distal end of the bristles (46) extend vertically at least partially beyond the shoe rest (18). Also, as shown, the shoe rest (18) may be provided with curved sections to accommodate the circular periphery of the rollers (44) while allowing the bristles (46) to extend beyond the shoe rest (18).

20 This arrangement ensures that when the rollers (44) rotate, the bristles (46) reach the sole of the shoe for scrapping the dust or dirt from the sole of the shoe while simultaneously preventing the sole of the shoe to touch the rollers (44). Any suitable material may be used for making the rollers (44) and the bristles (46) as known in the art. The rollers (44) at one end are supported by the first support member (38), whereas at other end by the gear assembly (28). In the embodiment as shown, three separate rollers (44) are used. In an alternate embodiment, a bristle pad run by two rollers (44) may be used, such as a conveyor belt, for scrapping off the dirt from the sole of the shoe.

30 The gear assembly (28) has spindles (48) that support the other end of the rollers (44). In the embodiment as shown, three spindles (48) are shown supporting the three rollers (44). The spindle and the rollers (44) are coupled such that their longitudinal axis coincide and on rotation of spindles (48), the rollers (44) also

rotate. The gear assembly (28) is provided with suitable mechanism, such as a gear train of spur gears intermeshing with each other, to rotate all the three spindles (48). The mechanism inside the gear assembly (28) is not shown for simplicity and any suitable known mechanism may be used. Further, the gear assembly (28) is adapted to be imparted a rotary motion by an electric motor (30). As shown in FIG. 2, the motor (30) and the gear assembly (28) may be coupled with each other using known mechanisms.

In the embodiment as shown, the brush assembly (16), the motor (30) and gear assembly (28) are configured such that the rollers (44) are rotated in an anti-clockwise direction (as seen in FIG. 3), i.e. such that when the SSC (10) is in operation the bristles (46) of the brush assembly (16) scrap the dirt from a front portion (50) of the SSC (10) towards a back portion (52) of the SSC (10). Accordingly, in the embodiment as shown, a shroud (54) is provided in the top cover (12) towards the back portion (52) of the SSC (10). The shroud (54) is configured to collect any dirt or dust thrown off from the bristles (46) of the brush assembly (16) when the SSC (10) is in operation. The shroud (54) is shown integral with the top cover (12). Any other suitable arrangement may be used as required.

The vacuum pump (32) is arranged towards the lower back portion (52) of the SSC (10). The vacuum pump (32) is arranged such that a suction port (56) of the vacuum pump (32) is located inside the housing (14) and an exhaust port (58) is located towards the back portion (52) for discharging the air from the vacuum pump (32) out of the SSC (10) in the atmosphere. As shown in FIG. 2, an exhaust cover (34) is provided at the exhaust port (58) to filter the air coming out of the exhaust port (58) and also to muffle the noise of the vacuum pump (32) when in operation. The exhaust cover (34) may be any suitable filter such as a coarse sponge filter.

The suction port (56) of the vacuum pump (32) is connected to the dust collector (24). The dust collector (24) is designed to receive the air containing the dust from the shoe sole and separate the dust from the air before the air is sucked through the suction port (56) of the vacuum pump (32). The dust collector (24) is provided with an in-port (62) and an out-port (64). The in-port (62) is configured to receive air

and dust particles from the vicinity of brush assembly (16) when the SSC (10) is in operation, and the out-port (64) is configured to discharge the air from the dust collector (24) towards the vacuum pump (32). When the dust collector (24) is installed, the out-port (64) of the dust collector (24) is in fluid communication with the suction port (56). A HEPA filter (66), i.e. High Efficiency Particle Arrestor, may be provided at the out-port (64) of the dust collector (24). The HEPA filter (66) is arranged such that when the dust collector (24) is installed in the SSC (10), the HEPA filter (66) is located at the junction of the suction port (56) and the dust collector (24) to arrest the fine dust particles from the contaminated air received in the dust collector (24).

Further, the dust collector (24) may be provided with other adequate provisions, to separate the dust particles from the air sucked in the dust collector (24). Suitable air passages with required shape and size may be provided in the dust collector (24) for separation of air and dust. For example, as shown in FIG. 3, a cyclone is provided in the dust collector (24) for separation of the dust particles.

Further, the dust collector (24) may have a chamber where separated dust is stored for later removal. The dust chamber may be provided with an opening (68) for discharging the dust and cleaning the dust chamber. The opening (68) may be sealed by a cap (not shown) to prevent any leakage of air or dust particles from the opening (68) when the SSC (10) is in operation.

The dust collector (24) and the housing (14) are configured such that the dust collector (24) can be removed easily from the SSC (10) for cleaning and also easily reinstalled in the housing (14) after cleaning the dust collector (24). In the embodiment as shown, the dust collector (24) is accessible from the front portion (50) of the SSC (10). For cleaning the dust collector (24), a user may pull out the dust collector (24) using a handle (70) provided on the dust collector (24). After removing the cap may be removed to open the opening (68) and the dust may be removed through the opening (68). Also, the HEPA filter (66) may be cleaned when the dust collector (24) is removed from SSC (10).

The top cover (12), the brush assembly (16), the first support member (38), the second support member (40), the third support member (42), the dust collector (24) and the vacuum pump (32) are arranged in the SSC (10) such that a fluid passage is formed for sucking the air along with dust particles from vicinity of the top cover (12), towards the dust collector (24) while passing about the brush assembly (16). The first support member (38) may be provided with suitable serrations or slots to allow the passage and flow of air from the vicinity of the brush assembly (16) towards the dust collector (24). The fluid passage further goes towards the suction port (56) of the vacuum pump (32) of the SSC (10). The components are designed and arranged so as to prevent any substantial leakage of air through the fluid passage for effectively collecting the dust from the shoes in the dust collector (24).

Further, the SSC (10) has the sensor (20) to detect presence of a shoe on the shoe rest (18). The sensor (20) is housed in the top cover (12) as shown in FIGS. 1-3. In the embodiment as shown, a proximity sensor is used to detect presence of the shoe on the shoe rest (18). Any other suitable type of sensor (20) or any alternate arrangement may be utilized to detect the placement of a shoe on the shoe rest (18). The sensor (20) is configured such that when a shoe is detected on the shoe rest (18) by the sensor (20), the sensor (20) is configured to generate a signal indicating presence of the shoe on the shoe rest (18), hereinafter referred to as ON signal. Similarly, when the shoe is removed or is not present at the shoe rest (18), the sensor (20) is configured to generate a signal indicating absence or removal of the shoe from the shoe rest (18), hereinafter referred to as OFF signal. The sensor (20) is configured to send the ON signal and/or OFF signal to the Electronic Control Unit, hereinafter referred to as ECU (36), for further processing. The OFF signal may also be an absence of the ON signal.

The ECU (36) is electronically coupled to the motor (30), the sensor (20) and the vacuum pump (32) for controlling operation of the SSC (10). The ECU (36) is configured to receive ON signal and OFF signal from the sensor (20) for operation of the SSC (10). When the ECU (36) receives an ON signal, the ECU (36) turns the motor (30) and the vacuum pump (32) ON to start operation of the SSC (10). On turning ON the motor (30), the rollers (44) start rotating to clean the shoe sole

with the bristles (46). As the vacuum pump (32) is running, simultaneously, the air is sucked in from the vicinity of the top cover (12) and the brush assembly (16). Therefore, the dirt and dust scrapped off from the shoe by the bristles (46) is carried along with the flow of the air towards the lower portion of the SSC (10) while
5 passing through the first support member (38) and then entering the dust collector (24) through the in-port (62). Further, when the ECU (36) receives the OFF signal, the ECU (36) switches the vacuum pump (32) and the motor (30) OFF to stop operation of the SSC (10) or keep the SSC (10) in OFF state when there is no shoe detected on the shoe rest (18).

10

The ECU (36) may also be electronically coupled to the status indicator (22) to indicate the ON/OFF state of the SSC (10). In the embodiment as shown, the status indicator (22) is a LED provided with a PCB driving circuit. An LED Cover (72) is provided to diffuse the light from the LED. When the SSC (10) is in ON state,
15 the LED glows, whereas the LED switches OFF when the SSC (10) is in OFF state.

The power port (26) may be configured to receive electric power for running the SSC (10). In an embodiment, a battery may be provided as a power source for running the SSC (10). Additionally, as shown in FIG. 1 and FIG. 2, the SSC (10)
20 may also have an ON/OFF SWITCH to switch on/off the SSC (10).

In an embodiment, the SSC (10) may have a UV lamp (98) to disinfect shoes/sandals from bacteria/viruses. In an embodiment, while using UV lamp, user may switch the machine on/off and leave the shoes inside a UV disinfection cabinet
25 for sole cleaning and disinfection. In an alternate embodiment, the UV lamp (98) may be provided near the brush assembly (16) to expose shoe to UV rays while the shoe is getting cleaned. In such embodiment, the UV lamp (98) may be electronically coupled with the ECU (36) to switch on/off along with the SSC (10).

30 In an embodiment, SSC (10) may be equipped with a music player. The music player may be configured such that when the SSC (10) is in ON state, music is played. In an embodiment, the music, tune or tone may be played for a predetermined time, such that the duration of the music, tune or tone indicates an

approximate time the SSC (10) takes for adequately cleaning the shoe. Also, the music may help in mitigating the noise of the components of the SSC (10) while the SSC (10) is working and at the same time may provide soothing experience to user.

5

In another embodiment, SSC (10) may be equipped with safety device to ensure that user doesn't fall while keeping his/her leg on the shoe rest (18). The safety device may be a handle (96) provided proximate to or on the SSC (10). The handle (96) may be attached to the housing. A retractable handle may be provided for ease of transportation.

10

In an embodiment, SSC (10) may be equipped with trolley handle and wheels for easy transportation of the SSC (10). The trolley handle may be retractable for easy and compact storage. The trolley handle and wheels may either be used as an accessory or may be provided along with the SSC (10).

15

In an embodiment, SSC (10) may have coin/card port electronically coupled with the ECU (36). The ECU (36) may be configured to switch on the SSC (10) only when a certain amount of payment is received by the coin/card port, so that a user can get his/her shoes/sandals cleaned after paying for the cleaning.

20

In an embodiment, the SSC (10) may have a display panel such as LCD/LED board to display instructions on how to use the SSC (10).

25

In an embodiment, SSC (10) may have a safety mechanism to ensure that shoe laces don't get stuck in the brushes endangering user getting his/her shoes/sandals cleaned. The safety mechanism may be either in form of instruction to the user on the LCD/LED board or a suitable mechanism may be provided to detect presence of shoe laces on the brush assembly (16) and the ECU (36) may be configured to switch off the SSC (10) on detection of shoe laces on the brush assembly (16).

30

The SSC (10) may further incorporate a shoelace sensor to detect presence of shoe laces on the brush assembly. The ECU may be coupled to the shoelace sensor and

the ECU may be configured to switch off the shoe cleaner on detection of shoe laces on the brush assembly. The shoelace sensor may be any known sensor such as position sensor that detects presence of the shoelace on the brush assembly. In an embodiment, the shoelace sensor may be placed on the shoe rest and coupled to the ECU for signalling presence of shoelace on the brush assembly to the ECU. In an embodiment, the shoelace sensor may be a torque sensor coupled to the rollers, spindle or the motor. When a shoe lace is stuck in the brush assembly and the motor, spindles or the rollers get subject to a stopping torque beyond a predetermined threshold, the ECU may be configured to switch off the SSC (10).

10

In another embodiment, SSC (10) may have a polishing mechanism to clean and shine the toe cap/throat/vamp and other top parts. Further, the SSC (10) may be able to dispense perfume/aroma for removing bad odor from the shoe.

15 The present disclosure is described with reference to the figures and specific embodiments; this description is not meant to be construed in a limiting sense. Various alternate embodiments of the disclosure will become apparent to persons skilled in the art upon reference to the description of the disclosure. It is therefore contemplated that such alternative embodiments form part of the present disclosure.

20

List of Reference Numerals

- Shoe sole cleaner, SSC (10)
- Top cover (12)
- 5 Housing (14)
- Brush assembly (16)
- Shoe rest (18)
- Sensor (20)
- Status indicator (22)
- 10 Dust collector (24)
- Power port (26)
- Gear assembly (28)
- Motor (30)
- Vacuum pump (32)
- 15 Exhaust cover (34)
- Electronic control unit, ECU (36)
- First support member (38)
- Second support member (40)
- Third support member (42)
- 20 Rollers (44)
- Bristles (46)
- Spindles (48)
- Front portion (50)
- Back portion (52)
- 25 Shroud (54)
- Suction port (56)
- Exhaust port (58)
- In-port (62)
- Out-port (64)
- 30 HEPA filter (66)
- Handle (70)
- LED cover (72)
- On/off switch (74)

The Claims:

1. A shoe sole cleaner (10) comprising:
 - a shoe rest (18) for placing a shoe;
 - 5 a brush assembly (16) having a plurality of rollers (44) with bristles (46) for cleaning a sole of the shoe;
 - a motor (30) coupled with the brush assembly (16), the motor (30) configured to run the brush assembly (16) to scrap off dirt from a sole of the shoe;
 - 10 a dust collector (24), to collect the dirt removed from the sole of the shoe;
 - a vacuum pump (32), to draw the dirt removed from the shoe towards the dust collector (24); and
 - a HEPA (High Efficiency Particle Arrestor) filter (66) situated
 - 15 between the vacuum pump (32) and the dust collector (24), to prevent the dirt from escaping the dust collector (24);
 - a sensor (20) configured to detect placement of a shoe on the shoe sole cleaner (10); and
 - 20 an electronic control unit (36) coupled with the sensor (20), the motor (30) and the vacuum pump (32), the electronic control unit (36) configured to run the motor (30) and the vacuum pump (32) for cleaning sole of the shoe on detection of placement of shoe on the shoe rest (18).
- 25 2. The shoe sole cleaner (10) as claimed in claim 1, wherein the sensor (20) is configured to detect absence of shoe from the shoe rest (18) and the ECU (36) is configured to switch off the motor (30) and the vacuum pump (32) on detection of absence of shoe.
- 30 3. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe rest (18), the sensor (20), the brush assembly (16), the dust collector (24), the motor (30), the vacuum pump (32) and the HEPA filter (66) are mounted in a housing (14).

4. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the sensor (20) is a proximity sensor.
- 5 5. The shoe sole cleaner (10) as claimed in any preceding claim, further comprising a gear assembly (28) to transmit rotary power from the motor (30) to the brush assembly (16).
6. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe rest (18) is made of two parallel rods extending along a longitudinal length of the shoe sole cleaner (10).
10
7. The shoe sole cleaner (10) as claimed in claim 7, wherein the shoe rest (18) is made of metallic rods.
15
8. The shoe sole cleaner (10) as claimed in claim 7, wherein the shoe rest (18) is supported at its two ends by a first support member (38) and secured in place between a top cover (12) and a third support member (42).
- 20 9. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the plurality of rollers are three rollers (44) with bristles (46).
10. The shoe sole cleaner (10) as claimed in claim 1, wherein the plurality of rollers (44) are supported by a first support member at one end and by the gear assembly at another end.
25
11. The shoe sole cleaner (10) as claimed in claim 5, wherein the gear assembly has plurality of spindles to support the other end of the plurality of rollers (44).
30
12. The shoe sole cleaner (10) as claimed in any preceding claim, further comprising a status indicator coupled to the ECU (36) to indicate the status of the shoe sole cleaner (10).

13. The shoe sole cleaner (10) as claimed in claim 12, wherein the status indicator is a LED.
- 5 14. The shoe sole cleaner (10) as claimed in claim 8, further comprising a shroud in the top cover to collect the dirt thrown off from the brush assembly (16).
- 10 15. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe sole cleaner (10) has a UV lamp for disinfection of sole of shoe.
- 15 16. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe sole cleaner (10) has music player for running music during operation of the shoe cleaner.
17. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe sole cleaner (10) has safety device for supporting a user using the shoe sole cleaner (10).
- 20 18. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe sole cleaner (10) comprises a trolley handle for facilitating transportation of the shoe sole cleaner (10).
- 25 19. The shoe sole cleaner (10) as claimed in any preceding claim, wherein the shoe sole cleaner (10) is equipped with a card/coin machine to facilitate pay and use for a user.
- 30 20. The shoe sole cleaner (10) as claimed in any preceding claim, comprising a display panel configured to provide instructions to a user for using of the shoe cleaner.
21. The shoe sole cleaner (10) as claimed in any preceding claim, comprising a shoelace sensor to detect presence of shoe laces on the brush assembly

(16) and the ECU (36) is configured to switch off the shoe cleaner on detection of shoe laces on the brush assembly (16).

22. The shoe sole cleaner (10) as claimed in any preceding claim, comprising
5 a polishing mechanism to clean and shine the toe cap/throat/vamp and other top parts of a shoe.
23. The shoe sole cleaner (10) as claimed in any preceding claim, comprising
10 a fragrance dispenser.
24. The shoe sole cleaner (10) as claimed in claim 17, wherein the safety device is a handle.

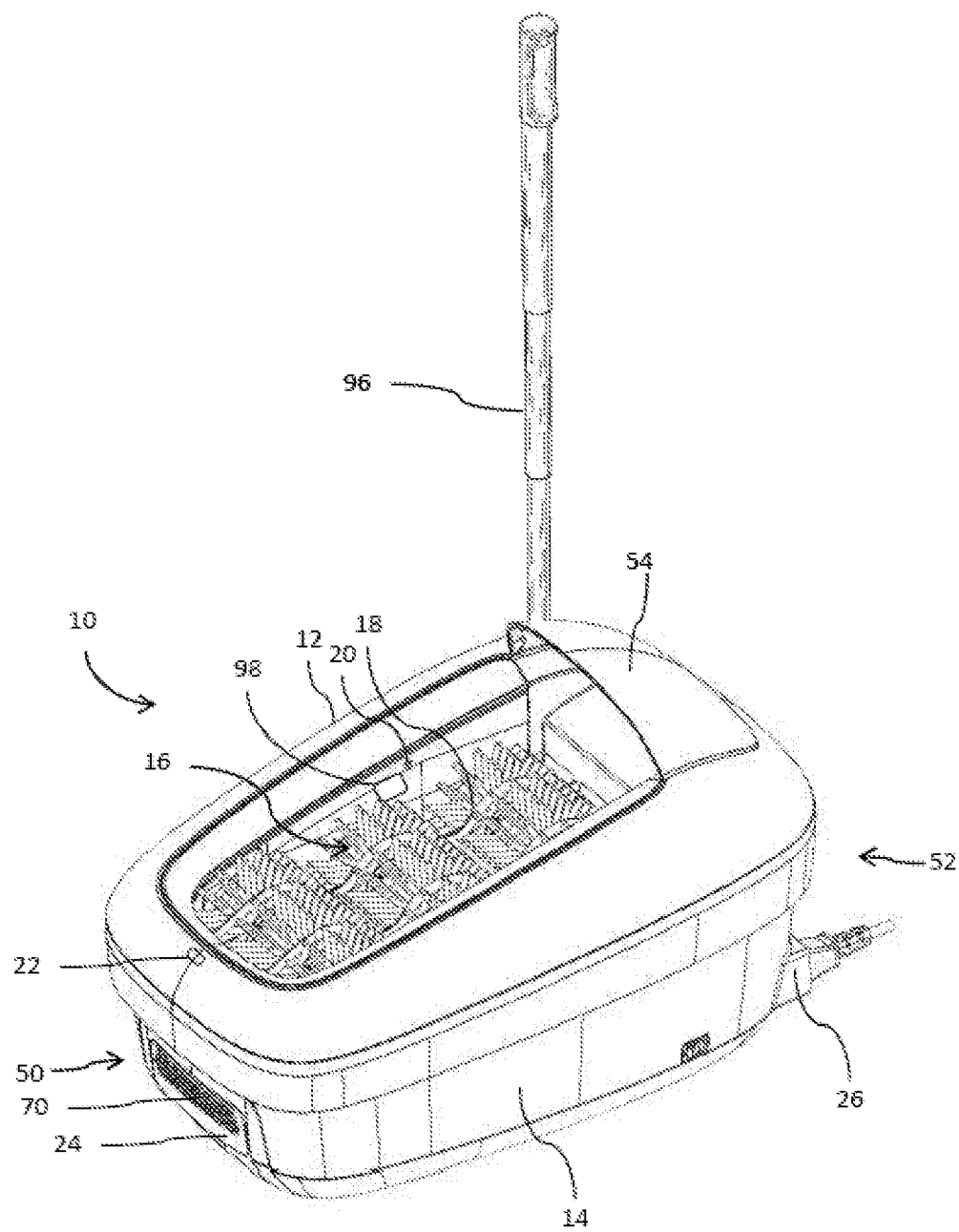


FIG. 1

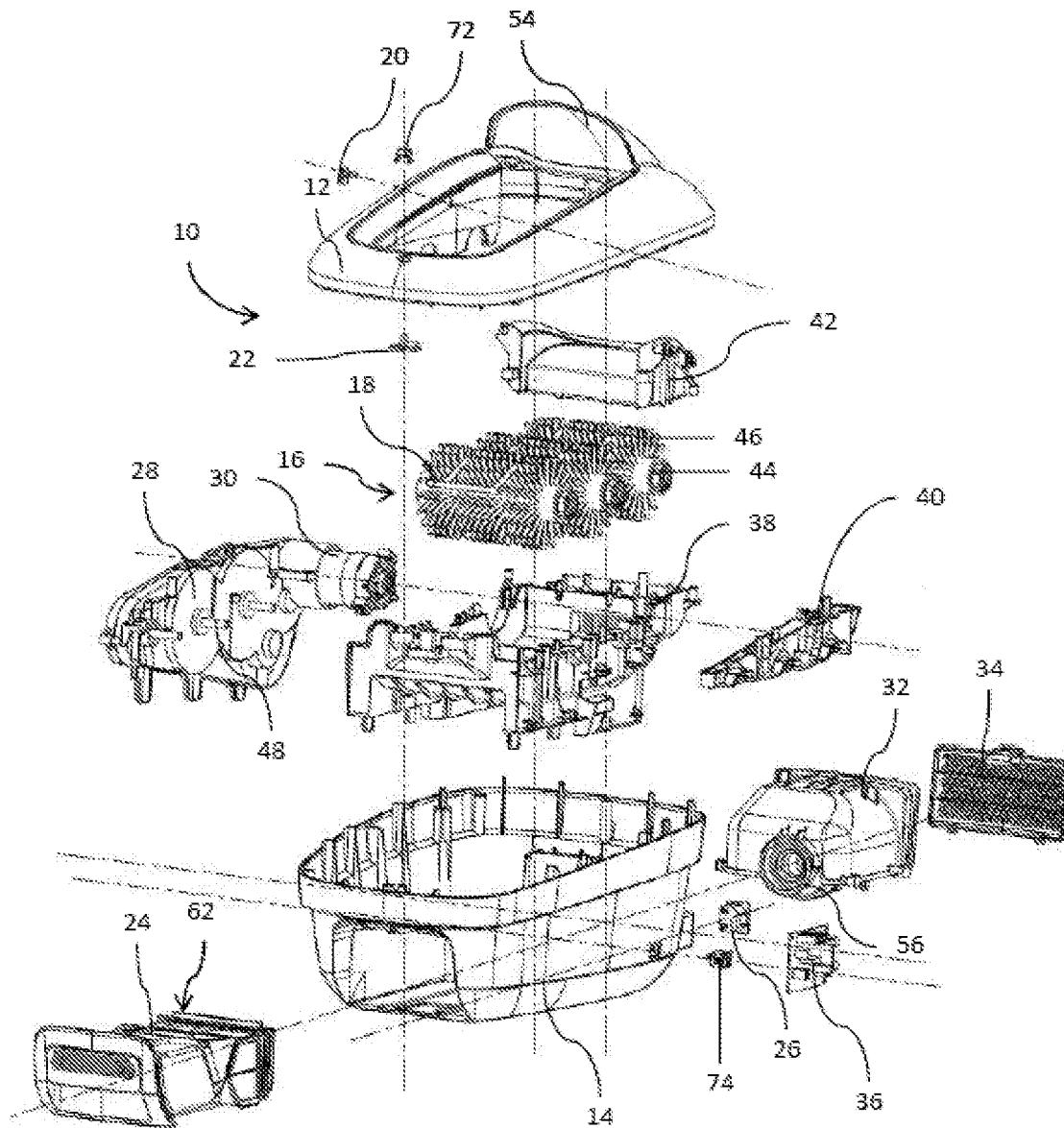


FIG. 2

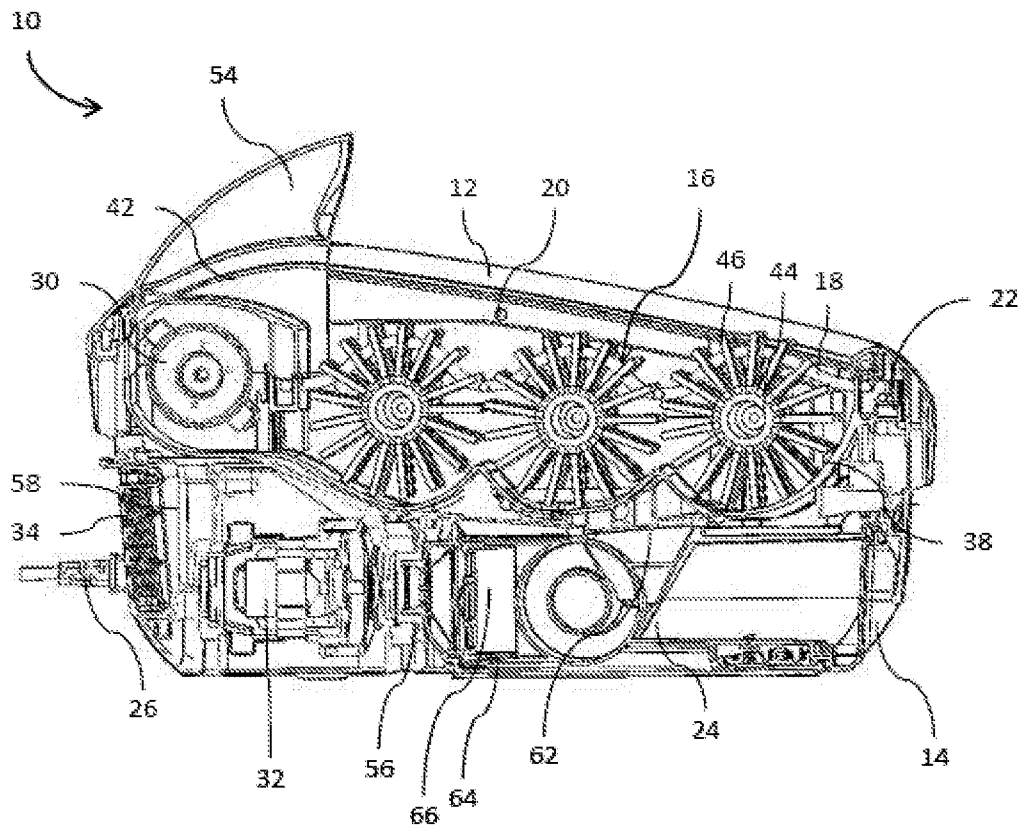


FIG. 3

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IN2017/050562

A. CLASSIFICATION OF SUBJECT MATTER
A47L23/00, A47L23/263 Version=2018.01

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

A47L

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

Patseer, IPO Internal Database

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2008/0289127 A1 (ROBERT GUY et al.; 27 Nov 2008) Abstract; Para. [0028]-[0031], [0038]-[0039]; Figs. 1, 2, 5.	1-24
Y	CN204091918 U (UNIV JILIN; 14 Jan 2015) Para. [0011], [0012], [0016].	1-24
Y	US3641609 A (WESLEY M. HANSEN; 15 Feb 1972) Abstract; Column 1: Lines 11-15, 22-29; Figs. 1, 2.	1-24
Y	CN2043868 U (WANG BOQI; 06 Sep 1989) Abstract; Fig. 1.	1-24

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

* Special categories of cited documents:	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"A" document defining the general state of the art which is not considered to be of particular relevance	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"E" earlier application or patent but published on or after the international filing date	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"&" document member of the same patent family
"O" document referring to an oral disclosure, use, exhibition or other means	
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

23-02-2018

Date of mailing of the international search report

23-02-2018

Name and mailing address of the ISA/

Indian Patent Office
Plot No.32, Sector 14, Dwarka, New Delhi-110075
Facsimile No.

Authorized officer

Divyanshu Mishra

Telephone No. +91-1125300200