

1,176,445.

Fig. 2.

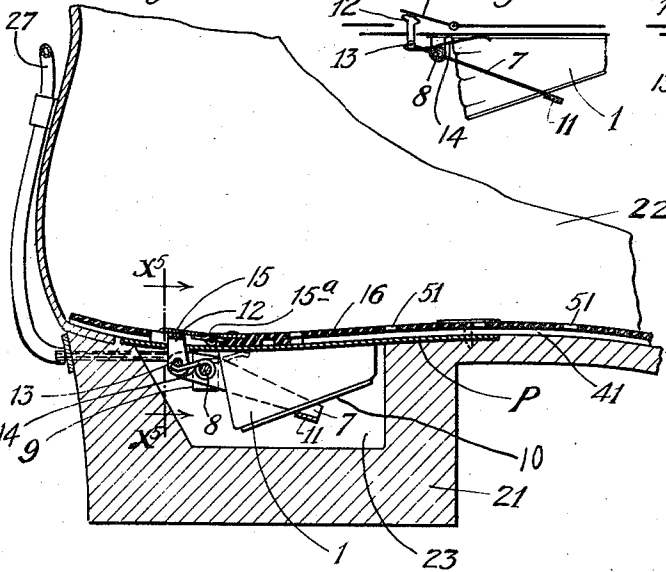


Fig. 3.

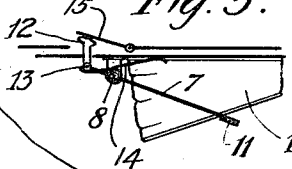


Fig. 4.

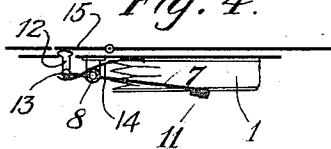


Fig. 5.

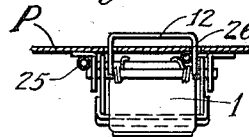


Fig. 6.

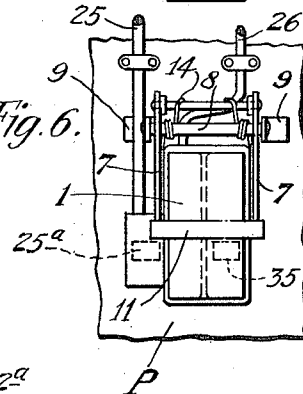


Fig. 7.

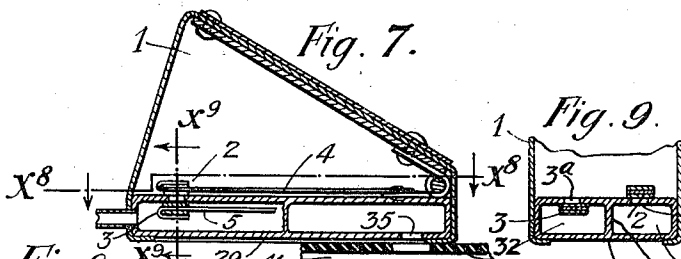


Fig. 9.

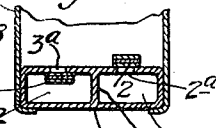
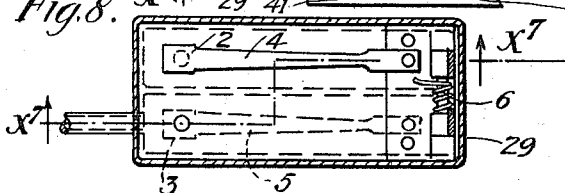


Fig. 8.



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UNITED STATES PATENT OFFICE.

DAVID F. HARAN, OF LOS ANGELES, CALIFORNIA.

SHOE-VENTILATING DEVICE.

1,176,445.

Specification of Letters Patent.

Patented Mar. 21, 1916.

Application filed October 12, 1915. Serial No. 55,574.

To all whom it may concern:

Be it known that I, DAVID F. HARAN, a subject of the Czar of Russia, residing at Los Angeles, California, have invented a new and useful Shoe-Ventilating Device, of which the following is a specification.

This invention pertains to a device for automatically maintaining a circulation of air within the shoe beneath the foot of the person wearing the shoe, with a view to keeping the foot in a more sanitary condition.

An object of the invention is to provide means to positively force the air along a definite channel, or series of channels beneath the foot, so that all portions of the sole of the foot will alike receive the benefit of thorough ventilation.

With these ends in view the invention comprises, in its preferred embodiment, a shoe-ventilating pump, operated by the increase and decrease of the pressure of the foot upon the bottom of the shoe in the act of walking.

Referring to the accompanying drawings, which illustrate the invention Figure 1 is a plan-view of a preferred embodiment of the device, showing the member for confining and directing the air-currents, the air channels of said member being on the underside thereof and being therefore indicated in dotted lines. The pumping device is also shown principally in dotted lines. Fig. 2 is a vertical section on line x^2-x^2 of Fig. 1. Fig. 3 is a diagrammatic view to illustrate the operation of the pumping device, the bellows being inflated. Fig. 4 is a view similar to Fig. 3, but showing the bellows deflated. Fig. 5 is an end-view of the pumping device, a portion of the shoe being sectioned on line x^5-x^5 of Fig. 2. Fig. 6 is a bottom plan-view of the parts shown in Fig. 5. Fig. 7 is a longitudinal, vertical section of the pump proper on line x^7-x^7 of Fig. 8. Fig. 8 is a transverse section on line x^8-x^8 of Fig. 7. Fig. 9 is a cross-section on line x^9-x^9 of Fig. 7.

Referring in detail to the drawings, the pumping device comprises a bellows 1, having an inlet-valve 2 and outlet-valve 3, supported respectively by the leaf-spring arms 4 and 5, said bellows being expanded by the spring 6. In order to contract said bellows the lever-arms 7 are provided, same being pivoted upon shaft or pintle 8, supported by the brackets 9. A cross piece 11 unites

said arms 7 and engages a metallic plate 10 on the bellows 9 to deflate said bellows when said arms 7 are rocked. The rocking of said arms 7 is accomplished by means of the thrust-bar 12, which is of an inverted U-shape, the arms of said thrust-bar being pivotally connected to lever-arms 7 by means of the pin 13. Spiral springs 14 tend to hold the cross-bar 11 together with levers 7 in the lowered position. A metallic flap 15, hinged to the channeled member or insole 16 is interposed between the foot of the wearer and the thrust-bar 12. Said flap is provided with an elevating spring 15^a. The bellows 1 is mounted within the heel 21 of the shoe or boot 22 said heel being provided with a chamber 23 large enough to house and provide room for the operation of said bellows which are suspended from a metallic plate P. An inlet-tube 25 provides outside air directly to the channeled member 16 by way of the inlet opening 25^a (see Figs. 1 and 6), said tube projecting through the back of heel 21. An outlet tube 26 is provided from the bellows through the back of the heel. These tubes are, in the illustrated embodiment of the invention, provided with small rubber hose 27 at their outer ends which pass up behind the shoe or boot to prevent water leaking into the shoe in rainy weather.

The inlet valve 8 coöperates with inlet-port 2^a; the outlet-valve 3 coöperates with outlet-port 3^a, these ports being formed in a casing 29 (Figs. 7 to 9) having an inlet chamber 31 and an outlet chamber 32, separated by a partition 33. The chamber 31 is provided with an inlet opening 35 (Figs. 1, 6 and 7) through which the bellows exhausts air from the channels of the channeled member 16. Said channeled member 16 has cut into the lower face thereof longitudinal channels or grooves 41, most of which communicate near their front ends with the cross-channel 42. In the heel portion additional cross channels 43 are provided, also the radial channels 44 and arcuate channel 45, these various channels communicating with each other in the manner illustrated in Fig. 1, where it will be seen that on one side said channel 45 communicates with one of the longitudinal channels 41, while on the other side of the insole there is an L-shaped dividing space 50, the long limb of which extends up to the cross channel 42 near the front end of the insole. The positions of the bellows-inlet-

port 35 and of the inlet-port 25^a for the insole (Figs. 1 and 6) are such as to compel the air to circulate over substantially the entire area of the insole. The insole is shown to be provided with perforations 51 to more perfectly ventilate the foot.

In operation, when, in the act of walking, the heel of the person's foot rises slightly, the parts assume the position indicated in Fig. 3, the hinged flap 15 being slightly elevated by the spring 14, permitting the bellows to inflate, the foul air from the channels of the insole being drawn into the bellows through the ports 35 and 2^a (Fig. 7). When the foot is placed upon the ground the flap 15 is depressed, deflating the bellows, thus expelling the foul air through port 3^a, chamber 32 and tube 26.

Owing to the fact that the bellows-operating device comprises arms which pass astride of the most expansible portion of the bellows 1, thereby bringing the cross bar 10 into slidable engagement with the middle portion of the lower plate 10 of the bellows, said plate 10 acts as an additional lever to accelerate the closing movement of the bellows.

It is to be understood that the invention is not limited to the precise construction shown and described, but that changes, within the scope of the claims may be made in the operating parts without departing from the spirit of the invention.

I claim:

1. In a shoe-ventilating device, the combination, with means to direct the air currents to ventilate the shoe, of a bellows, a plate from which said bellows is suspended, lever arms passing astride said bellows,

means operable by the pressure of the foot to oscillate said lever arms, and a cross-bar connecting the free ends of said lever arms, said cross-bar being adapted to engage and operate said bellows.

2. In a shoe-ventilating device, the combination, with means to direct the air currents to ventilate the shoe, of a bellows of the wedge-shaped type, means to suspend said bellows within the shoe, and a bellows-operating device comprising arms which pass astride the most expansible portion of the bellows, said arms being provided with a cross-bar in slidable engagement with the lower side of the bellows.

3. In a shoe-ventilating device, the combination, with means for directing the air currents within the shoe, of a bellows, means to suspend said bellows in an operative position, a vertically extending and vertically reciprocatory thrust bar guided in its reciprocation by reason of extending through an opening in said bellows-suspending means, and a bellows-actuating member having a fulcrum pivot between its end, one end of said member being pivoted to the lower end of said thrust-bar and the other end of said member operating against the lower side of said bellows.

In testimony whereof I have hereunto signed my name in the presence of two subscribing witnesses at Los Angeles, in the county of Los Angeles and State of California, this 6th day of October 1915.

DAVID F. HARAN.

Witnesses:

ALBERT H. MERRILL,
GEORGE T. PARKER.