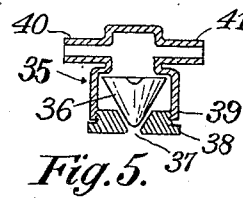
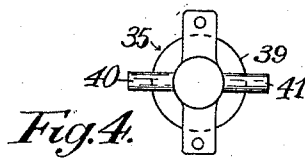
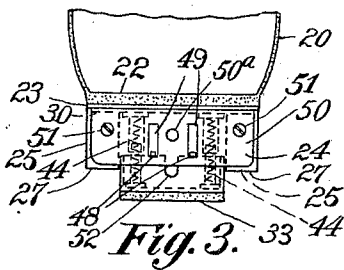
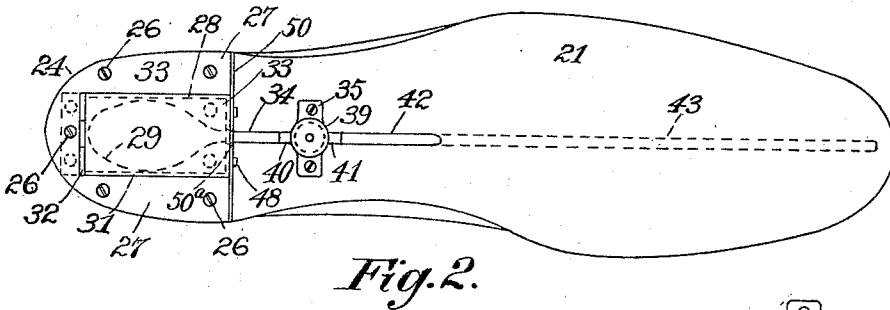
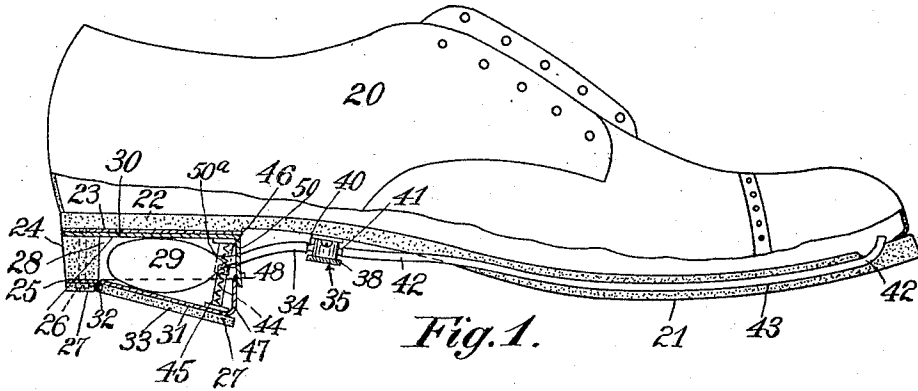


J. A. WHERRY.
SHOE VENTILATOR.
APPLICATION FILED JULY 24, 1919.

1,364,226.

Patented Jan. 4, 1921.
2 SHEETS—SHEET 1.

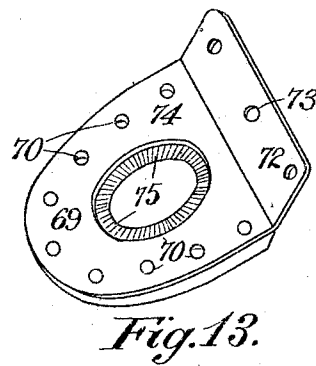
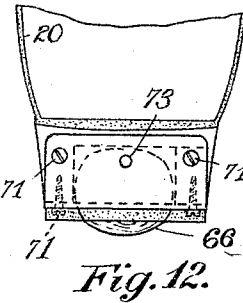
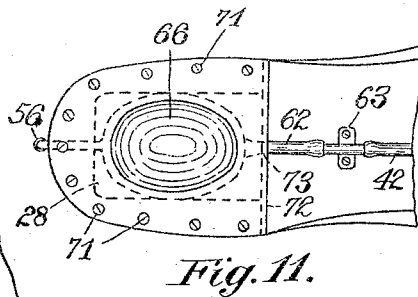
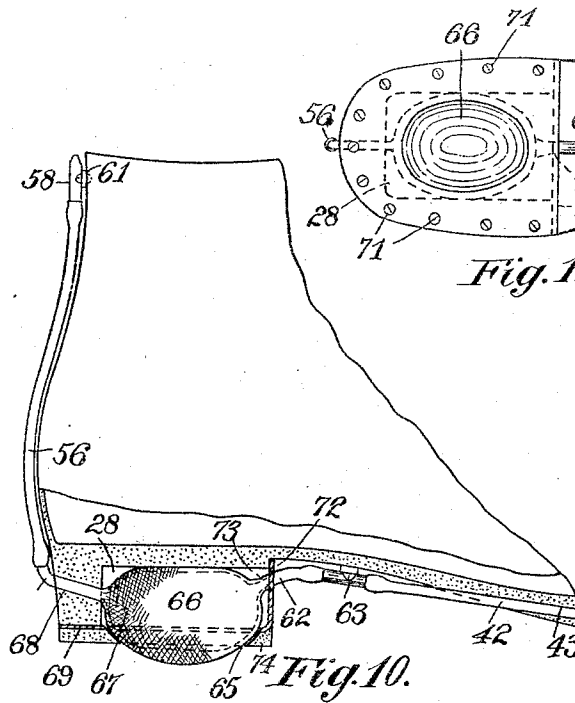
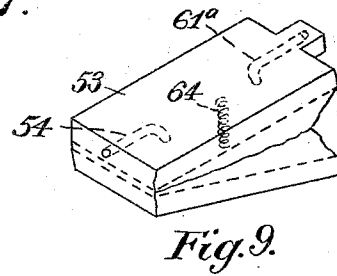
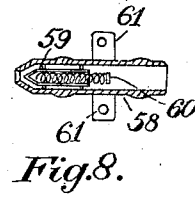
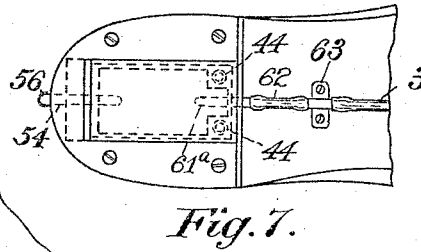
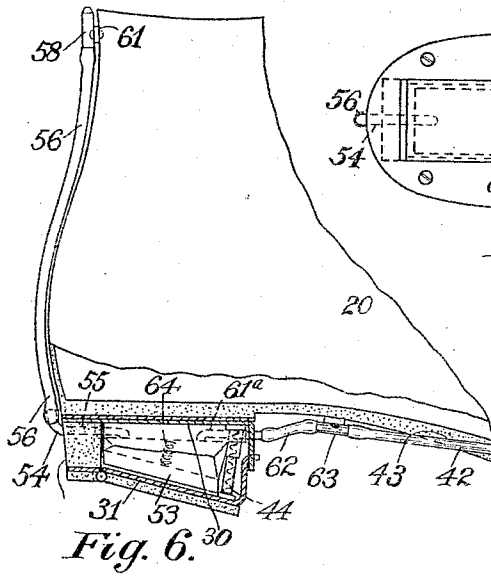


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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

JOHN A. WHERRY, OF NEW ORLEANS, LOUISIANA.

SHOE-VENTILATOR.

1,364,226.

Specification of Letters Patent.

Patented Jan. 4, 1921.

Application filed July 24, 1919. Serial No. 313,022.

To all whom it may concern:

Be it known that I, JOHN A. WHERRY, a citizen of the United States, residing in New Orleans, in the parish of Orleans and State of Louisiana, have invented certain new and useful Improvements in Shoe-Ventilators, of which the following is a specification.

This invention relates to ventilating means for shoes and other footwear, whereby air is automatically forced into the shoe by the act of walking.

It has been proposed to introduce a rubber bulb into the interior of the shoe, where the foot will rest directly thereon, and to employ such bulb in supplying air; but one of the aims of my invention is to avoid the discomfort that would be experienced by the contact of the foot with the bulb. It has also been proposed to have the heel consist of a bulb of rubber, to compress under the weight of the wearer, permitting him to sink at every step; but one of the objects of my invention is to avoid the undesirable yielding quality that would be possessed by such a heel.

The main object of my improvements is to provide a shoe having a comfortable interior perfectly fitted to the foot, with nothing to chafe or cause discomfort, and one having a firm heel like an ordinary shoe, and yet which by the act of walking will automatically force air into the shoe, slipper or the like. To this end, I provide a heel which is firm and sustains the weight of the user as well as any ordinary heel, so that taken altogether there is no inferiority in the fitting or comfort of the shoe as compared with the ordinary non-ventilating shoe; and in such heel I provide a recess, in which I place a collapsible device which protrudes a trifle below the firm bottom or wearing surface of the shoe heel, and which is somewhat compressed by the rocking of the shoe at every step; but the compression is so slight as not to be appreciable or objectionable to the user. Thus air is pumped unconsciously into the shoe, since the compression of said collapsible device forces air through a tube or conduit into the interior of the shoe, said collapsible device preferably in the form of a springy bulb, and the tube being preferably concealed within the sole and opening into the toe of the shoe. Air may be taken in through a valve which is arranged under the instep, but preferably through a tube which leads out from the rear of the heel and

runs up close to the shoe to the top thereof, where it is tipped with an intake valve.

In place of the bulb, which is preferably made of vulcanized fabric, or a long-wearing combination of fabric and rubber, such as is used in making some kinds of tires, there may be employed a bellows, whereof the bottom part may be attached to or bear upon a plate hinged to the bottom of the heel, and normally inclining downwardly below the front of the heel, but which at each step is partly closed or brought flush with the firm portion of the heel, thereby causing the bellows to force a little air into the shoe. In place of using a bellows, a rubber bulb may be compressed between the hinge leaf and the upper part or roof portion of the recess in the heel.

Other features and advantages will hereinafter appear.

In the accompanying drawings,

Figure 1 is a part-sectional elevation of a shoe provided with my improvements in one form; a bulb being inserted in the heel, to be compressed by a plate inserted in the bottom of the heel between the sides thereof, and hinged to the rear of the heel.

Fig. 2 is an inverted plan of the shoe seen at Fig. 1.

Fig. 3 is a vertical section of the lower part of the shoe seen at Figs. 1 and 2, taken just forward of the heel.

Fig. 4 is a plan and Fig. 5 a sectional elevation of a pump valve inserted in the tubing between the bulb or bellows and the interior of the shoe.

Fig. 6 is a sectional fragment of a shoe showing my invention in another form, with a bellows compressible between the small inserted hinge plate and the top portion of the heel; the air being drawn in through a tube which runs up alongside the rear portion of the shoe.

Fig. 7 is an inverted plan of the device seen at Fig. 6.

Fig. 8 is a sectional detail of an intake valve used in the upper part of the vertical tube seen at Fig. 6.

Fig. 9 is a perspective view of the bellows seen in the form at Fig. 6.

Fig. 10 is a sectional view of the rear part of a shoe, showing my invention in its preferred form, a compressible bulb being inserted in a recess in the shoe heel and protruding through an opening made in the bottom of the firm heel, so that it is slightly

compressed at each step of the wearer, and having an upwardly extending intake tube at the rear, and a forwardly extending tube to deliver air to the interior of the shoe.

5 Fig. 11 is an inverted plan of the form seen at Fig. 10.

Fig. 12 is a sectional front elevation, of the devices seen at Figs. 10 and 11.

Fig. 13 is a perspective of the plate, detached, which retains the bulb in the heel at Fig. 10; showing the hole through which a portion of the bulb protrudes, and the guard plate which forms the front of the heel.

In the form of the invention shown in 15 Figs. 1 to 5, the shoe upper is designated as 20 and the sole as 21, said sole extending back to form the upper part of a heel at 22. This portion of the heel is faced with a thin plate 23 which may be of metal. The body 20 of the heel may be of leather or other suitable material, as designated at 24. Said heel is faced by a metal plate 25 which is held on by screws 26, and this metal plate is faced by a wearing surface of leather or rubber 27 which may be attached to said plate 25 either by said screws 26 or in any suitable way.

The body of the heel is cut away to form in its underpart a recess 28 which may be 30 rectangular, and within said recess is placed a springy bulb 29 which may be compressed between the upper plate 30 of the heel and a leaf 31 which is hinged at 32 to the bottom heel plate and faced with leather or wearing material 33; this compression taking place 35 as the foot, after the rear edge of the heel strikes the ground, rocks downwardly and forwardly, so that no resistance to the movement of the foot is noticed by the user. The squeezing of the bulb forces air through a tube 34 into a valve fitting 35 which contains a conical gravity valve 36, Fig. 5, to close a conical opening 37 in a plug 38 which is screwed into the bottom of a housing 39, 40 said housing being surmounted by nipples 40, 41, upon which are caught the forward end of said tube 34 and the rear end of another tube or duct, 42, which leads the air into the interior of the shoe; the sole 21 being longitudinally bored at 43, and the tube 50 inserted therethrough and opening at its forward end within the interior of the shoe, as illustrated at Fig. 1. The valve 36 drops when the bulb is compressed, and closes the valve opening 37 against loss of air; but the valve lifts when the bulb expands again, so as to admit air into the bulb. The air enters through the valve opening 37 more freely than from the confined space within the shoe, so that fresh air is pumped into the shoe at every step.

The bulb may be made of rubber so that it will expand when the pressure is released; and there also may be provided compression 65 springs 44 to open the leaf when the heel is

lifted from the floor. Each compression spring may be confined within a two-part telescopic casing, one part 45 rising from the leaf and the other 46 pendent from the roof of the heel cavity. The leaf may also be 70 guided by means of a plate 47 turned up at the forward end thereof and having fingers 48 to project within guide slots 49 provided in a guard plate 50 which is secured by screws 51 and forms the forward wall of the 75 heel and is bent down from the main plate 30. Said fingers may also engage the bottom ends of the slots, as at Figs. 1 and 3, for limiting the opening movement of the leaf. The wall 50 may have an opening 80 50^a for the tube 34, and the plate 47 may have a corresponding slot 52, Fig. 3.

Thus it will be seen that at every step the bulb is compressed and fresh air is forced into the shoe, while when the heel is lifted 85 the leaf is forced down and the bulb is permitted to expand, thereby drawing in a fresh supply of air through the valve fitting 35. This is effected without detracting from the firm supporting quality of the heel, 90 without chafing or rendering uncomfortable the foot, and without appreciable effort upon the part of the wearer, or resistance to the movement of the shoe. It will also be seen that the shoe heel has a large firm wear- 95 ing surface 27 at sides and rear, so that the shoe is durable; and this surface sustains the weight of the user, so that very little compressing effect is produced upon the bulb 29, which therefore is long-lived. 100

In the form of the invention shown at Fig. 6, there is used in place of the bulb a collapsible device in the form of a bellows 53, which is seen in perspective at Fig. 7, 105 and which is confined between the leaf and the upper plate or roof 30 of the cavity in the heel. This bellows may be of any suitable or ordinary construction, and may draw in air through an inlet pipe 54, which extends from the bellows through a hole 110 55 in the rear wall of the heel, and is connected to a rubber tubing 56, which runs up alongside of the rear wall of the shoe to the top thereof, and terminates in a spring-pressed inlet fitting 58, containing 115 an air valve 59, which is shown open at Fig. 8. This valve 59 is normally closed by a compression spring 60, which is inserted in the valve, the latter being of hollow conical form, to fit the valve casing. 120 Said casing may be attached to the shoe by means of ears 61.

The air is compressed when the bellows 53 is compressed by the closing of the hinged plate or leaf 31, and passes out 125 through a short pipe 61^a, which is connected by a rubber tube 62 to a back-check valve 63 of ordinary construction, which prevents the bellows from drawing air from the shoe, but permits air to be forced by the bellows 130

through the main tube 42 into the toe of the shoe. Upon lifting the foot, the plate 31 is opened by the compression springs 44; and a light compression spring 64 may also be provided within the inside of the bellows to open the same. A similar internal spring may also be provided for bulb 29, if desired.

In the device seen at Figs. 10 to 13, in place of using a hinged leaf 31, as at Figs. 1 and 6, the entire heel, including the bottom, is made firm or immovable, but an opening 65 is left therein through which protrudes the lower portion of bulb 66, which may be of rubber, or a combination of rubber and fabric 67 similar to that used in various kinds of wheel tires, to give flexibility and long wearing qualities. This bulb 66 terminates at one end in a duct 68 which leads through the rear of the heel to the lower end of inlet tube 56, which extends up alongside of the shoe to an intake valve 58, as at Fig. 6. The bulb terminates at the other end in tube 62, which leads to back-check valve 63, the latter opening into tube 42 which extends to the toe of the shoe, as already explained in connection with Fig. 1.

In the Fig. 10 form, the upper heel plates 23, 30 may be omitted, if desired, and the heel formed of lifts of leather, or made of a solid block of a suitable rubber compound, and a rectangular or other form of recess 28 may be cut in the body of the heel, said recess being preferably closed by a bottom iron or steel plate 69, which may have holes 70 for screws 71 to attach the same to the body of the heel. Said plate may be bent upwardly at 72 to form the front of the heel, said front catching over those parts of the upper portion and sides of the heel which are left intact. This front plate is provided with an opening 73 for the duct 62. The plate may have a wearing face 74 of leather, or rubber or other material, and the opening in the plate and rubber may be interiorly beveled at 75 to conform to the curvature of the bulb 66, as seen at Figs. 10 and 13.

It will be seen that in this preferred device, extreme simplicity is secured, hinged or moving parts in the heel not being required, and the bulb projecting so slightly as to be unobjectionable in either appearance or operation, since there is very slight resistance to the usual rocking of the heel in stepping; and, if anything, this springy bulb lends a slight buoyancy or elasticity to the step, and is therefore an advantage. Moreover, there is little or no liability of objection from ingress of water, since the bulb, being made of rubber, is water-proof. Moreover, the bulb is normally fitted tightly or compressed within the recess in the heel and constantly tends to expand, so that the

body thereof constantly closes the opening in the bottom of the heel.

It will thus be seen that by a simple, inexpensive device, readily applicable in various forms to existing shoes, ventilation may be successfully accomplished.

Variations may be resorted to within the scope of the invention, and portions of the improvements may be used without others.

Having thus described my invention, I claim:

1. In combination, a shoe having a firm heel provided with a recess in its bottom portion, a collapsible device inserted in said recess to be compressed by the act of walking, and a tube and valve device extending from the collapsible device to force air into the interior of the shoe, a plate being hinged to the bottom of the shoe and capable of closing said recess and depressing said collapsible device.

2. In combination, a shoe having a firm heel provided with a recess in its bottom portion, a collapsible device inserted in said recess to be compressed by the act of walking, a tube and valve device extending from the collapsible device to force air into the interior of the shoe, a plate being hinged to the bottom of the shoe and capable of closing said recess and depressing said collapsible device, and a spring to open said plate.

3. In combination, a shoe have a firm heel provided with a recess in its bottom portion, a collapsible device inserted in said recess to be compressed by the act of walking, and a tube and valve device extending from the collapsible device to force air into the interior of the shoe, a plate being hinged to the bottom of the shoe and capable of closing said recess and depressing said collapsible device, said plate bent upwardly at its forward end and coöperating with a plate bent upwardly from the top of the heel to form a front for the heel, one of said plates having a guide slot and the other having a finger entering said slot.

4. In combination, a shoe having a firm heel provided with a recess in its bottom portion, a collapsible device inserted in said recess to be compressed by the act of walking, a tube and valve device extending from the collapsible device to force air into the interior of the shoe, a plate being hinged to the bottom of the shoe and capable of closing said recess and depressing said collapsible device, and a spring to open said plate, means being provided for limiting the opening movement of said hinged plate.

5. In combination, a shoe having a firm heel provided with a recess in its bottom portion, a collapsible device inserted in said recess to be compressed by the act of walking, a tube and valve device extending from the collapsible device to force air into the in-

terior of the shoe, a plate being hinged to the bottom of the shoe and capable of closing said recess and depressing said collapsible device, a compression spring tending to open said plate, and a two-part telescopic housing for said compression spring.

6. In combination, a shoe having a firm heel provided with a recess in its bottom, a collapsible device inserted in said recess and protruding therefrom beneath the heel, and means, inclusive of a tube leading from said collapsible device to the interior of the shoe at the toe thereof, to enable said collapsible device to force air into the shoe in the act of walking, said collapsible device in the form of a bulb, formed of a long-wearing combination of fabric and rubber, a valve fitting

being inserted in the tubing leading from said bulb, said valve fitting comprising a valve to open to permit air to enter the tubing, and to close to prevent air from escaping.

7. In combination, a shoe having a firm heel, a recess being provided in said heel, a bellows in said recess, a plate hinged to the bottom of the heel and operating said bellows in the act of walking, an opening spring for said bellows, a spring for opening said plate, and connections whereby said bellows pumps air into the shoe.

JOHN A. WHERRY.

Witnesses:

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J. N. SWING.