

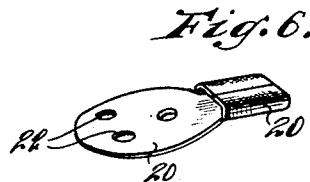
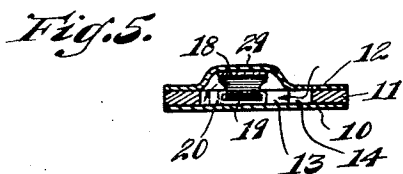
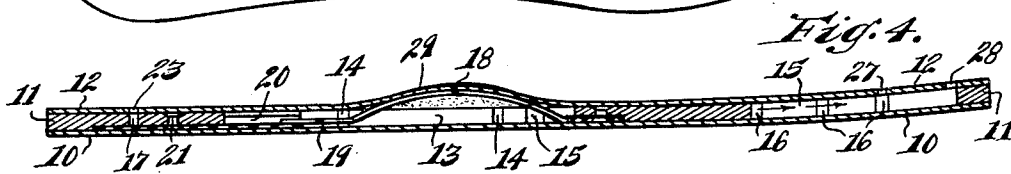
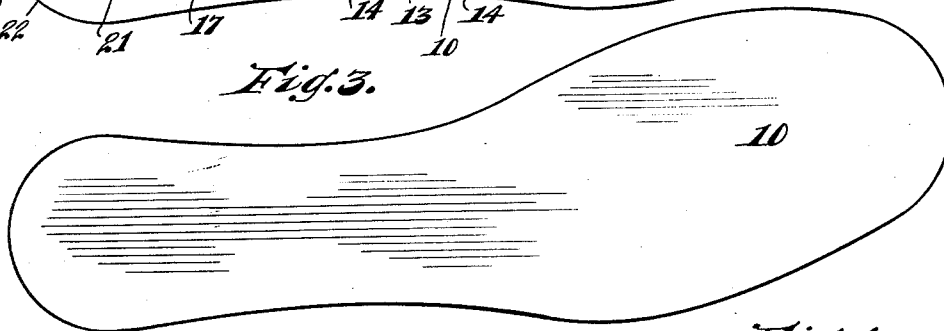
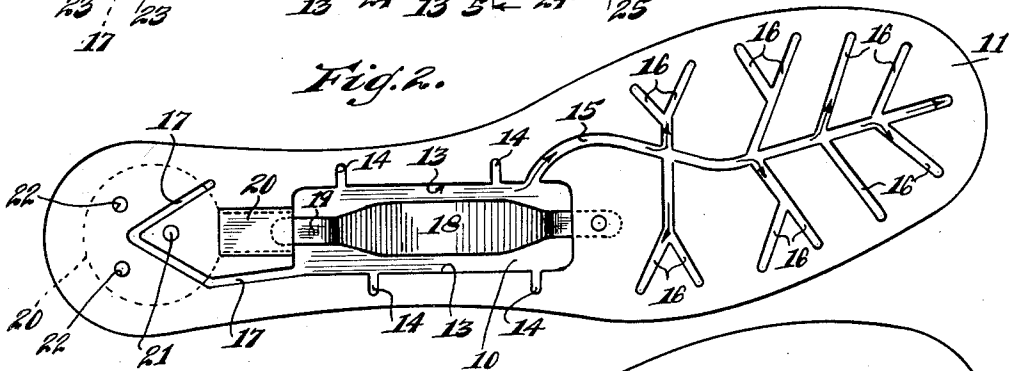
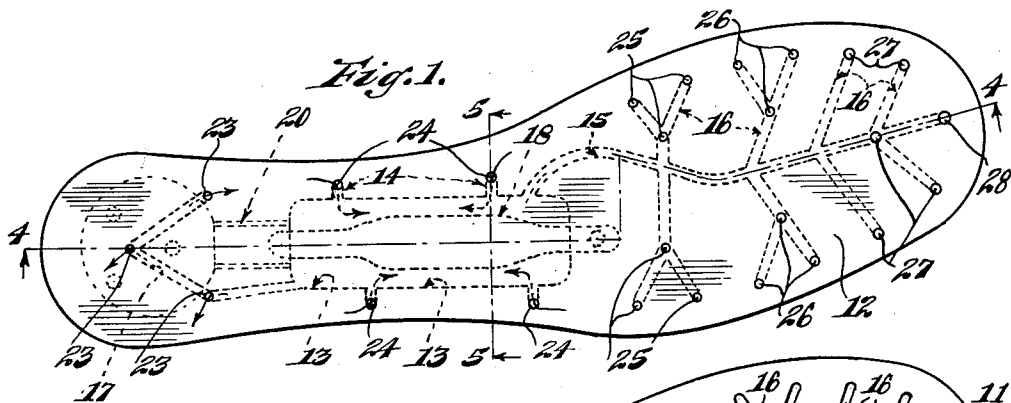
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2,010,151

SHOE VENTILATING DEVICE

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SHOE VENTILATING DEVICE

Arthur Carl Helwig, Chicago, Ill.

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3 Claims. (Cl. 36—3)

This invention relates to improvements in shoe ventilating devices and the like. It relates more particularly to a device for changing the air inside of a shoe, which device may be inserted into a shoe which is already manufactured for use therein, or it may be manufactured into a shoe as a component part thereof.

I am well aware of the fact that shoes have been put out embodying devices attempting to accomplish the ventilation of shoes, but I have found that all of the shoes referred to have been subject to serious disadvantages. A list of objections to which some or all of the devices referred to are subject includes the following: The fact that the device was capable of use only as an integral part of a manufactured shoe and could not be used as an insert into a shoe already manufactured; the fact that the means for introducing air into the shoe quickly became clogged up in practical use, or the device was inefficient in permanent operation for other reasons; the fact that the means for circulating the air was not airtight; the fact that the air was not properly distributed and some parts of the foot received air and others did not, or received an insufficient amount; the fact that complicated external tubes were required, rendering the device not only cumbersome but unattractive; the fact that specially constructed heels or shoes were required; and the fact that unusually large and uncomfortable shoes were necessary. Other objections have been the excessive number of parts, difficulty of assembly, and expense of construction.

It has been my object to produce a device of the kind mentioned which will not only eliminate the aforesaid disadvantages, but which will be a distinct step in advance of anything of the kind ever heretofore produced. In my preferred form the device which has been selected to illustrate the principle of my invention comprehends, among other features, a simple insole which is easily insertable into any shoe after manufacture, and which also may be introduced in the process of manufacture. It comprehends three layers of material. The bottom layer is a blank, and the middle layer has stamped therein a slot to accommodate a form of bellows, and has also cut therein a connecting series of slots reaching to various parts of the toe and heel portion of the insole which are so located and designed as to reach the parts of the foot where air is needed. The device also comprehends a top layer which is placed on top of the middle layer and secured thereto, the top layer having a series of apertures which are adapted to register with the slots of the

middle layer. By this means when the weight of the foot is placed upon the bellows, air is pumped through the various slots and expelled through the associated apertures of the top layer of material. When the three layers are secured together the slots obviously form channels for the transportation of the air to the various apertures.

The three layers, particularly the middle layer, are preferably constructed of a suitable material such as leather, and of a suitable thickness of said material to insure the permanent maintenance of the channels and the transmission of air therethrough. When the weight of the foot is lifted off the bellows a series of breather holes is provided adjacent the instep and air is drawn therethrough into the bellows to be pumped on the next operation in proximity to the foot.

The apertures hereinbefore referred to in the top layer of the material have been graduated; that is to say, with respect to the toe portion of the insole, or the portion where the ball of the foot normally rests, the largest aperture is located at the tip of the insole, and the next largest apertures are located somewhat nearer to the instep. A still smaller aperture is located still nearer the instep, and the smallest apertures are located nearest the instep and breather holes. The principle of this is that all or most of the pumped air will not be absorbed by the nearest apertures. The apertures farther away from the breather holes and the pumping means are compensated by the fact that they are larger, and thereby, though farther away, they are able to secure the desired portion of the pumped air and a satisfactory distribution in general is obtained.

While there has been shown an insole insertable into an already manufactured shoe in the drawing, the device is capable, as has been stated, of being incorporated in the manufacture of a shoe. While in my preferred form I take the air in around the instep over the side of the shoe, as for example the side of an oxford shoe, one or more apertures may be located in the upper of an oxford. The location of these apertures in the upper of the shoe has the advantage that the danger of clogging from water or dirt is, as a practical matter, eliminated, which is not the case where the apertures are located in the sole of the shoe.

The invention also has for an object the provision of means for accomplishing the said results which will be distinguished by its simplicity of construction and its relatively small cost of manufacture.

These and other objects and advantages of my

invention will appear from the specification hereinafter set forth.

The invention will be best understood by reference to the accompanying drawing, forming a part of this specification, and in which:

Fig. 1 is a top plan view of the top layer of the insole of my invention, with the other underlying parts of the insole indicated in dotted lines;

Fig. 2 is a top plan view of the middle layer of the insole of my invention;

Fig. 3 is a top plan view of the bottom layer of the insole of my invention;

Fig. 4 is a sectional view, taken on the line 4-4 of Fig. 1;

Fig. 5 is a sectional view, taken on the line 5-5 of Fig. 1; and

Fig. 6 is a perspective view of the guiding means for the bellows spring of my invention.

The preferred form of construction for an insertable insole which has been selected for purposes of illustration comprises an insole having three layers. The bottom layer 10, as shown in Fig. 3, is a blank, and superimposed upon this bottom layer is a middle layer 11, and placed on top of the middle layer is a top layer 12. The middle layer 11 in the form shown in Fig. 2 is provided with a slot 13 having a plurality of extensions of said slot, 14. The purpose of this slot 13, which is located in the instep region of this layer, is to allow for the operation of a bellows, as will hereinafter appear. Connected to the slot 13 is another slot 15 extending up into the toe portion of the layer 11. Extending laterally from the slot 15 are branch slots 16, extending to either side of the central slot 15, as will be apparent from the drawing. The slot 15 and its branches function to transmit the air pumped from the bellows to various parts of the middle layer, as will hereinafter appear. Also extending from the slot 13 is another connecting slot 17 which extends into the heel portion of the layer 11 for the distribution of the air pumped by the bellows into the heel portion of the foot, as also will later more clearly appear.

Attached, by means of a rivet or otherwise to the under surface of the layer 11, is a spring 18 which is bowed upwardly as shown in Fig. 4, and which has a horizontal extremity 19 which is adapted to reciprocate in a hollow guiding member 20 which is affixed to the under surface of the layer 11 by riveting or other means 21. It will be apparent that when weight is placed upon the spring 18 the same will be moved downwardly so that the extremity 19, which is normally always located to some extent in the hollow guiding member 20, will be moved further therein, and the spring properly positioned at all times. The hollow guiding member 20 is provided also with a pair of apertures 22 for the purpose of permitting the glue or other adhesive means to secure the bottom layer 10 to the under surface of the middle layer 11.

The top layer 12 is substantially the same in form as the bottom layer 10, except that it is provided with a number of apertures which are of different sizes. For example, in the heel region of the layer 12 there are provided three apertures 23 which are in my preferred form about one-sixteenth of an inch in diameter. In the instep region of the layer 12 there are four apertures 24 which in my preferred form are about three-thirty-seconds of an inch in diameter. In the fore portion of the layer 12 there is provided a series of apertures 25 which are in my preferred form of the same diameter as the apertures 23,

to-wit, one-sixteenth of an inch. Also provided is another series of apertures 26 which are slightly larger than the apertures 25, being about five-sixty-fourths of an inch in diameter in my preferred form, and these apertures 26 are located nearer the toe portion of the layer 12. Another series of apertures 27 is located still nearer to the toe portion than any of the apertures heretofore mentioned, and these apertures 27 are, in my preferred form, of about the same diameter as the diameter of the apertures 24, to-wit, three-thirty-seconds of an inch. Located at the tip of the toe region of the layer 12 is an aperture 28 which in my preferred form is the largest aperture in the layer 12, being about five-thirty-seconds of an inch in diameter.

In assembling the parts the layer 11 is secured to the bottom layer 10 by means of glue or other adhesive, and thereafter the top layer 12 is placed upon the layer 11 as secured to the layer 10, although this order need not be followed in assembly. When the top layer 12 has been secured to the middle layer by a suitable adhesive, or by sewing, or both, the interior of the entire insole will be practically airtight excepting for the apertures 24 which are known as "breather" apertures or holes, and the other apertures, and in the normal condition of the insole the spring 18, bowed upwardly as heretofore described, will extend upwardly in the inset region of the insole, as is clearly apparent from Fig. 4 of the drawing. In this condition it will raise the central unsecured portion 29 of the layer 12 to a plane above the rest of the insole, as will be apparent to those skilled in the art. This result of raising the portion 29 of the top layer is made possible by natural or artificial stretching, or by allowing for an extra area of leather or other material in that region, as will be obvious to those skilled in the field. It should be clearly understood that the apertures of the top layer 12 are placed in registry with the extremities or the other portions of the slots of the layer 11.

The operation is as follows: The normal condition, as heretofore stated, is as shown in Fig. 4. When the weight of a person's foot in walking, for example, is not placed upon the spring 18 and the instep portion of the insole, the insole and the bellows will be filled with air, as will the various slots and their branches and the apertures. When a step is taken and the weight of the person is placed upon the portion 29 and the spring 18, these portions, which form a bellows in combination with the other parts of the device, will be depressed, and while some air may escape through the "breather" holes 24, most of the air in the bellows will be transmitted through the various slots in the heel and toe portions of the insole, and through the apertures of these portions into proximity to the foot of the person. Because of the arrangement of the graduated holes by which the smallest apertures, for example, in the toe portion of the insole, are located nearest the bellows, whereas the larger holes are farthest away, all of the pumped air will not be absorbed through the nearest apertures, and the apertures farther away having the compensation of being larger, will be able to obtain a suitable supply of pumped air. With respect to the heel portion, the apertures have been made of a size which I have found suitable to the equitable distribution of the air to all parts of the foot.

When the weight of the person is lifted from the portion 29 and the spring 18, the spring and portion will return to the condition shown in

Fig. 4, and in doing this will draw in a new supply of air through the breather apertures 24, said apertures obtaining their air from, for example, over the adjacent sides of a common oxford shoe, although if desired air may be let in through one or more apertures in the upper of the shoe at points adjacent the breather apertures 24. Some of the air already in proximity to the foot of the person may be drawn back into the various apertures of the heel and toe portions of the foot of the device, but not enough to interfere with the attainment of the practical object of introducing a sufficient amount of fresh air.

If necessary, the guiding element may have a ring of stitching around it to hold it more securely in place. The bellows in the preferred form shown has been located under the instep of the foot, and the insole is thereby conformed to the natural contour of the bottom of the foot. For people with extremely tender arches, the arch of the spring may be reversed so that the arch is next to the sole of the shoe.

By virtue of my invention, a form of which has been selected for purposes of illustration, a highly satisfactory distribution of air and a highly efficient and convenient pumping action has been secured which will not only remedy perspiration of the feet and benefit health, but which will eliminate much fatigue and embarrassment, not to mention the elimination of foot and skin diseases. It will also have a beneficial effect in preventing the lining of shoes from rotting, and in the preservation of the life of socks or stockings, and will also be an advantage to persons working with high voltage electric currents.

The air is pumped to the foot from apertures in the fore part and the heel part of the device, and the fact that the air channels are of limited area makes for an improved pumping result. The use of a rigid form retaining material such as leather serves to insure the permanent clearance of the channels.

The device which I have illustrated and described is not of course the invention itself, but is merely the preferred form of construction for carrying my invention into effect. This form is capable of much variation and modification without departing from the spirit of the invention. It is not, therefore, limited to the details of construction set forth, but extends to all variations and modifications as come within the substance of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. An insole for a shoe including bottom, middle, and top layers of leather, and means for securing said layers together, the middle layer being provided with a slot forming a chamber in

said insole, an upwardly bowed bellows spring in said chamber attached at one end to said insole, a hollow guiding member attached to said insole for guiding the movement of the other end of the spring, said middle layer being provided also with connecting slots for said first mentioned slot, one of said slots leading to the fore portion of the insole, said connecting slot having branch slots, and another of said connecting slots leading to the heel portion of the insole, said connecting slot also being provided with branch slots; said top layer being provided with outlet apertures in the heel portion and breather apertures in the instep portion connected to said chamber and outlet apertures in the fore portion graduating larger in size to the toe portion of the insole, the aforementioned slots and branches registering with the outlet apertures and constituting channels for supplying air.

2. An insole for a shoe including bottom, middle, and top layers, means for securing said layers together, said middle layer being provided with a chamber, a bowed bellows spring in said chamber attached at one end to said insole, a hollow guiding member attached to said insole for guiding the movement of the other end of said spring, said middle layer being also provided with connecting slots communicating with said chamber, one of said slots leading to the fore portion of the insole, said connecting slot having branch slots, and another of said connecting slots leading to the heel portion of said insole, said top layer being provided with outlet apertures in the heel portion and breather apertures in the instep portion connected to said chamber and outlet apertures, said slots and branches registering with the outlet apertures and constituting channels for supplying air.

3. An insole for a shoe including bottom, middle, and top layers, means for securing said layers together, said middle layer being provided with a chamber, a bowed bellows spring in said chamber attached at one end to said insole, a hollow guiding member attached to said insole for guiding the movement of the other end of said spring, said middle layer being also provided with connecting slots communicating with said chamber, one of said slots leading to the fore portion of the insole, said connecting slot having branch slots, and another of said connecting slots leading to the heel portion of said insole, said top layer being provided with outlet apertures in the heel portion and breather apertures in the instep portion connected to said chamber and outlet apertures, said slots and branches registering with the outlet apertures and constituting channels for supplying air, said outlet apertures in the fore portion graduating larger in size toward the toe portion of the insole.

ARTHUR CARL HELWIG.