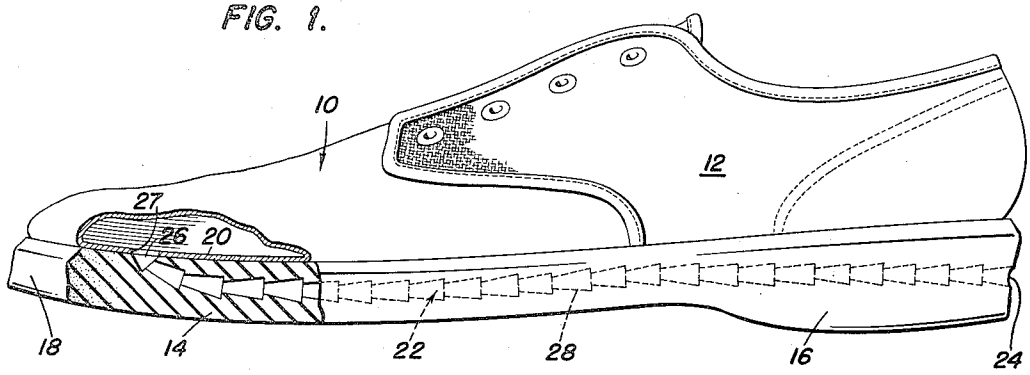
Dec. 6, 1955 R. B. SCHMIDT 2,725,646

RUBBER SHOE SOLE CONSTRUCTION WITH AIR PUMPING CONDUIT

Filed Jan. 5, 1955

FIG. 1.



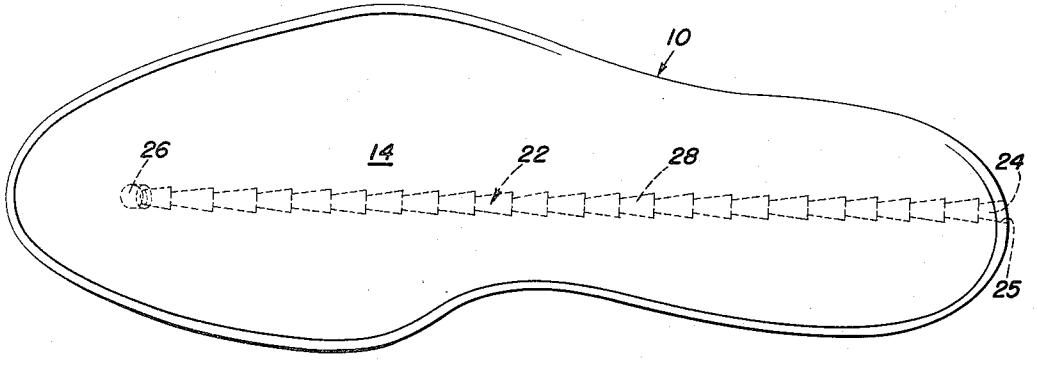


FIG. 2.

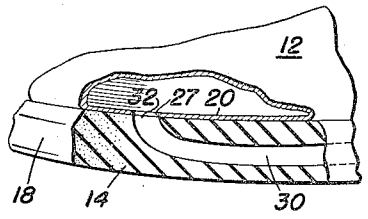


FIG. 3.

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RUBBER SHOE SOLE CONSTRUCTION WITH AIR PUMPING CONDUIT

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2 Claims. (Cl. 36—3)

This invention relates to a shoe sole construction for shoes having a rubber main sole possessing substantial compressibility.

In spite of the fact that shoes having such soles and a foot covering upper of canvas-like fabric or leather have been known for many years and are now sold in large volume, no adequate solution has been presented for the problem of foot sweating when they are worn.

Therefore, the general object of this invention is to provide a simple, dependable means for aerating a rubber shoe sole in the foot contacting surface, forward of the shank portion, without requiring the addition of any separate element, or materially increasing the cost of shoe manufacture.

To attain these objectives only moderate change is required in the construction of the compressible rubber sole itself and in its foot contacting surface.

It has been proved that by providing a rubber sole having the characteristics described with an internal conduit formation of particular shape and size extending longitudinally from the edge surface of the heel end portion to the upper surface of the toe end portion and normal pressure shifting of the foot when walking will produce a forward pumping action adequate for the intended purpose. When the rubber sole has a foxing strip secured laterally around its peripheral edge surface an opening must be provided therein as a continuation of the adjacent end of the conduit formation. Similarly, when an insole layer or sock lining of impregnated fabric material is mounted over the rubber sole, an aligned air discharge opening is required in the insole member.

This general description discloses the simple, valveless construction by means of which the required forced aeration of the toe zone can be provided in shoes of the character indicated without objectionable departure from standard construction or shoe making procedure.

The above and other features of novelty by means of which the useful objects specified are achieved will be more fully understood from the following detailed description of a preferred embodiment, when taken in connection with the accompanying drawings, in which:

Fig. 1 is a partially sectioned side elevational view of a shoe embodying the present invention;

Fig. 2 is a bottom plan view of the shoe of Fig. 1; and

Fig. 3 is a partially sectioned side elevational view of a shoe like the one of Figs. 1 and 2 but having a modified conduit formation.

In the illustrative embodiment of Figs. 1 and 2 a shoe **10** of conventional canvas upper, oxford style construction has a laced upper **12**, a unitary, compressible rubber sole member **14** of substantial thickness formed with a depending heel portion **16** having a somewhat greater combined thickness, and a rubber foxing strip **18** cemented to or vulcanized around the entire lateral edge surface of the sole member **14**.

Nearly all shoes of the type of shoe **10** are provided with a fabric insole member **20** known as a sock lining, and integrally secured as by adhesive to the upper and

foot-contacting surface of the rubber sole member **14**, as shown in the sectioned part of Fig. 1. Such a sock lining, even with the addition of cork, minimizes but slightly the excessive foot sweating that would otherwise take place.

The aerating means comprises a conduit formation **22** extending longitudinally within the rubber sole member **14** from an inlet opening **24**, positioned in the heel end portion of the sole edge face and aligned with a like-sized opening **25** in the foxing strip **18**, to an outlet or discharge opening **26** in the upper surface of the forward end portion of said sole member aligned with a like-sized opening **27** formed in the sock lining **20**.

The conduit formation **22** is made up of a plurality of interconnected funnel sections **28** having their smaller discharge ends directed toward the opening **26** of the toe end of the shoe **10**.

The modified shoe construction shown by Fig. 3 is similar in all respects to that of Figs. 1 and 2, except that it has a conduit formation **30** of substantially uniform bore extending from the same heel portion inlet position **24** to the same forward sole outlet position **32** joining aligned sock lining opening **27**.

Each of the conduit formations **22** and **30** has an effective inside diameter of about five-sixteenths (5/16) inch.

The conduit formations may also be embodied in resilient rubber tubing that is in turn incorporated within the aligned sock lining opening **27**.

In the use of shoes embodying the present invention, fresh air is forced progressively forward through conduit formation **22** or **30** by the natural rocking action of the foot sole in walking. This action on the rubber conduit wall tends to close it at the heel inlet end when the heel of the foot first reaches the ground and thus to squeeze the conduit progressively toward the toe end until the air it contained is discharged at the outlet. The outlet is preferably at a point beneath the toes because there is minimum resistance to discharge and maximum need for aeration in that zone. It has been found also that air thus discharged with some force will pass back across the foot sole.

The funnel or multiple bellows formation of conduit **22** has been found somewhat more effective in forcing air forwardly than is the uniform bore of conduit **30**, but the removal of lint and dirt entering the outlet end and dust from the inlet end is exposed to freer scouring action in the latter.

When the inlet opening **24—25** is positioned about one-half between the top and bottom of the sole edge surface at the heel, the normal position of a trouser cuff will conceal it at most times and protect it from dust. In the event that the sole **14** were submerged enough for rainwater to be drawn in, the foot would by then have become wet with any sole.

It will also be understood that the operation of forming the conduit formations shown can be readily assimilated in the molding of the rubber soles without appreciable increase in molding cost.

Furthermore, while crepe rubber is preferred, other forms of rubber now being molded into shoe soles, and sufficiently compressible will also be used.

Although an illustrative and preferred embodiment of the shoe sole construction has been described in detail, it is to be understood that the inventive principles are not limited to the forms shown, and that the construction may be modified in various particulars without departing from the scope of the appended claims.

Having thus described my invention, what I claim as novel and desire to secure by Letters Patent of the United States is:

1. A heavy shoe sole consisting of compressible rubber

formed with an open continuous tubular conduit having a small flow diameter and extending longitudinally within the sole from an air inlet opening in the rearward edge face of the heel end thereof to an air outlet opening in the toe part of the upper surface of the sole.

2. The shoe sole of claim 1 in which the tubular conduit is composed of a plurality of interconnected tapered funnel sections having their smaller discharge ends directed toward the toe part of the sole.

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