Aug. 16, 1938. P. G. FLINT 2,127,255

SHOE

Filed March 25, 1935

Fig. 1.

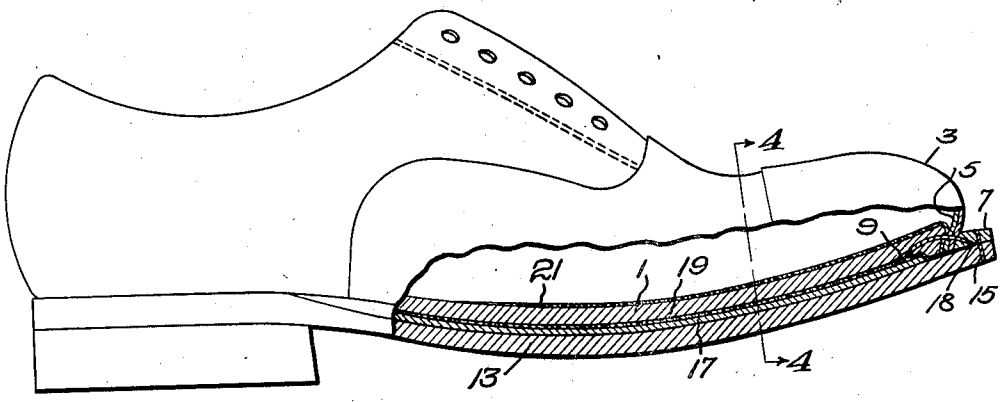


Fig. 2.

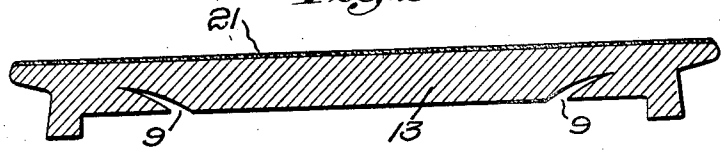


Fig. 3.

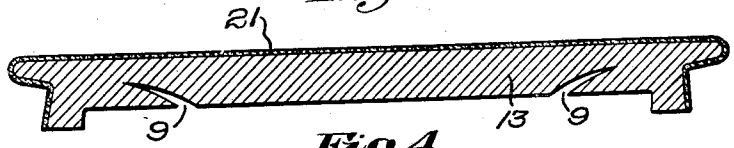
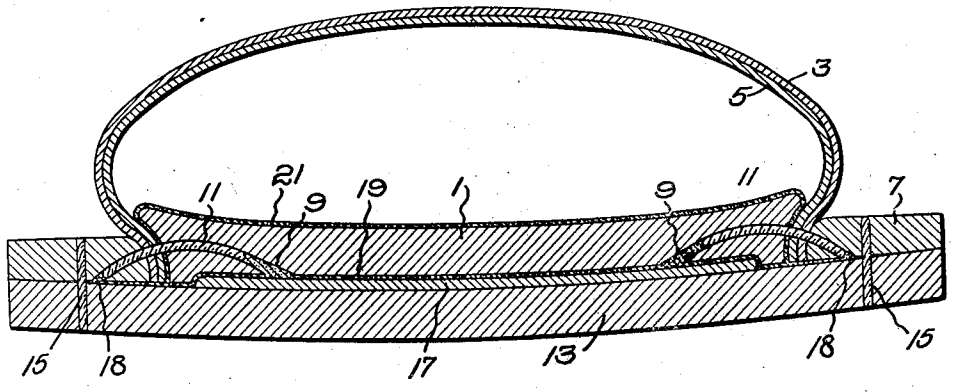


Fig. 4.



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SHOE

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Application March 25, 1935, Serial No. 12,772

2 Claims. (Cl. 36—17)

My invention relates to shoes, and more particularly to shoes having an improved insole and a construction which renders them water tight.

In the drawing:—

Figure 1 is a side elevation of a shoe constructed according to the invention with parts broken away;

Fig. 2 is a transverse section of one form of insole for the shoe constructed according to Fig. 1 on an enlarged scale before it is incorporated into the shoe;

Fig. 3 shows a modified form of insole constructed according to the invention; and

Fig. 4 is a section on the line 4—4 of Fig. 1 on an enlarged scale.

Referring to the drawing, which illustrates one form of shoe according to the invention, I have shown a shoe having an insole 1, and uppers comprising the upper leather 3 and lining 5, the latter being of textile material or soft leather, or a combination of the two. At the outer edge of the insole is a welt 7, the insole being channeled adjacent the welt as indicated at 9. A line of stitches 11 extends through the channel 9 of the insole through the uppers and welt for securing these parts in assembled relation. The sole 13, as illustrated, is secured to the welt by a line of stitches 15, a filler 17 being inserted between the insole and sole.

The construction just described provides a space between the insole and welt filled by the uppers. The seam or crack thus existing forms a means whereby water can leak into the interior of the shoe. Also, in such a shoe, water can leak into the interior thereof by way of the welt groove 16 and channel 9 of the insole through the line of stitching. Further, the textile lining, when employed, has its edges exposed at the outer surface of the insole and thus forms a means which tends to act as a wick to draw moisture into the interior of the shoe. Still further, the material of the insole commonly absorbs moisture.

For waterproofing the shoe in the present embodiment of the invention, a coating 19, shown in the drawing as of exaggerated thickness, may be applied to the under surface of the insole and welt and be permitted to dry after the shoe is lasted and before the filler 17 and sole are applied. Preferably, sufficient material is applied in forming the coating 19 to fill or close the insole channel 9 and welt groove 16. This coating may extend over the entire width of the under surfaces of the welt and insole, or it may be of such width as merely to fill or close the insole channel and welt groove and the surfaces of the insole and welt therebetween including the seam between the insole and welt. In either of these ways the seam between the insole and welt and the exposed portions of the stitching may be completely waterproofed, and as the material of which the coating is formed is applied in a liquid state it will impregnate the exposed end portions of the stitches 11 and lining 5 and thus destroy the tendency of these parts to act in the nature of wicks.

It has been found in practice that the upper side of leather insoles, particularly the portion thereof which contacts with the ball of the foot, becomes rough and somewhat sticky due to the chemical action of moisture absorbed from the foot. This reduces the comfort to the wearer of the shoe after the latter has been in use for some time. It has been found that this defect may be eliminated, and the comfort of the wearer of the shoe increased, by applying to the upper surface of the insole, particularly at the portion thereof which contacts with the ball of the foot, a layer of waterproof, friction-reducing material in the nature of a sheet of Celluloid or Cellophane.

It has been found impractical, for various reasons, to apply actual Celluloid or Cellophane in the form of sheet material as such, particularly when the sheet is very thin. Therefore, according to the present invention, this sheet material is applied to the upper surface of the insole in a liquid form which permits the coating to be extremely thin and to possess superior properties as compared to actual Celluloid or Cellophane.

I have found as suitable for use in forming the sheet or coating on the upper surface of the insole a nitrocellulose base, containing a plasticizer such as di-ethyl-phthalate or castor oil, dissolved in a volatile solvent, the latter preferably being a mixture of ethyl alcohol and amyl acetate. The nitrocellulose base may be Celluloid or nitrated cotton or wood fibers. The di-ethyl-phthalate or other plasticizer makes the coating flaccid, that is to say, gives it the property which enables a thin sheet of leather or the like to be bent or crumpled without fracture. The amyl acetate causes the cellulose base to be slightly absorbed by the leather surfaces to which it is applied so as to penetrate them to a slight extent and secure good adherence. The ethyl alcohol is employed to increase the solubility.

As suitable proportions of constituents of the coating material, but without limitation thereto, it has been found that satisfactory results will be secured by using 0.8 pound of Celluloid to each

gallon of a mixture of the other constituents in approximately the following volumetric proportions: ethyl alcohol 75%, amyl acetate 20%, diethyl-phthalate 5%. These proportions however are capable of considerable variation, and preferably the amount of solvent is varied to control the thickness of the layer applied to the upper surface of the insole.

This layer 21 has wearing qualities commensurate with those of Celluloid or Cellophane, and is highly durable, being of a tough, horn-like character, which enables it to resist wear and permits the coating to be so exceedingly thin that, due to its transparency, casual inspection does not indicate its presence. It further materially reduces the friction between the bottom of the foot and the insole. Apparently, even when the coating is worn away after very long use of the shoe, the slight surface impregnation of the leather by the material still makes the leather waterproof and eliminates the stickiness and roughness caused by the chemical action of perspiration on the leather, the prevention of absorption also making the insole sanitary.

The waterproofing at the under side of the insole and welt, if desired, may be the same material as that applied to the upper surface of the insole, except preferably the amount of Celluloid or the like is increased in proportion to the amount of solvent so that a thicker coating is formed. For example, one pound of Celluloid to a gallon of the solvent it has been found will give satisfactory results.

In Fig. 2 the coating 21 is shown applied to the top surface of the insole. In Fig. 3 this coating is shown as extending about the side edges of the insole so that when the coating 19 is applied to the under side of the insole and welt the coating 21 will be integrally united with the coating 19, thus improving the waterproofing at the seam between the insole and welt.

For sanitary reasons, if desired a substance having either or both fungicidal and germicidal properties may be incorporated into the liquid for forming the coatings 19 and 21. For this purpose I may intimately mix with the liquid material, before it is applied to the insole, fungicides and germicides such as phenol, cresol or iodoform as, for example, about 1% by weight of phenol or an equivalent amount of cresol or iodoform.

It will be understood that wide deviations may be made from the form of the invention described without departing from the spirit of the invention.

I claim:

1. A shoe having a leather insole the upper surface and side edges of which have a flaccid, wear-resisting, friction-reducing coating of waterproof material, a non-tacky, flaccid, wear-resisting coating of waterproof material on the under surface of said insole integrally united with the first mentioned coating, and a sole operatively secured to said insole in non-adhering relation to the coating on the under surface of said insole.

2. A shoe having an insole at least a portion of the upper surface of which and the side edges of which adjacent said portion have a flaccid, wear-resisting, friction-reducing coating of waterproof material, a welt sewed to said insole, a non-tacky, flaccid, wear-resisting coating of waterproof material on at least the welt seam and stitch portions of the under side of the insole integrally united with the first mentioned coating, and a sole secured to said welt in non-adhering relation to the insole.

PERLEY G. FLINT.