

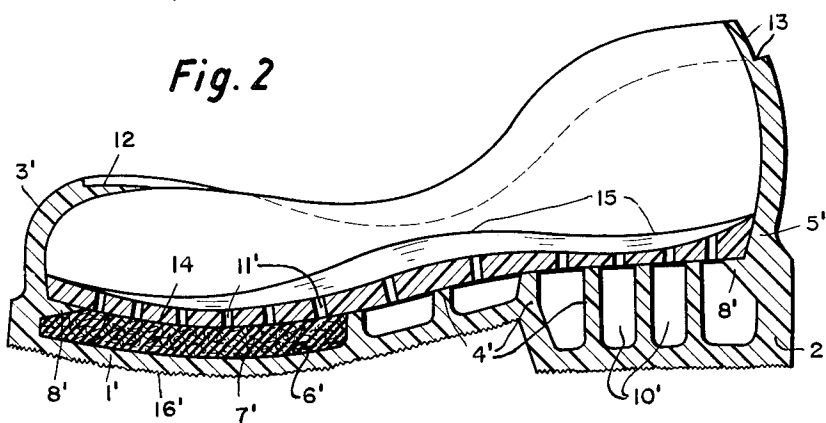
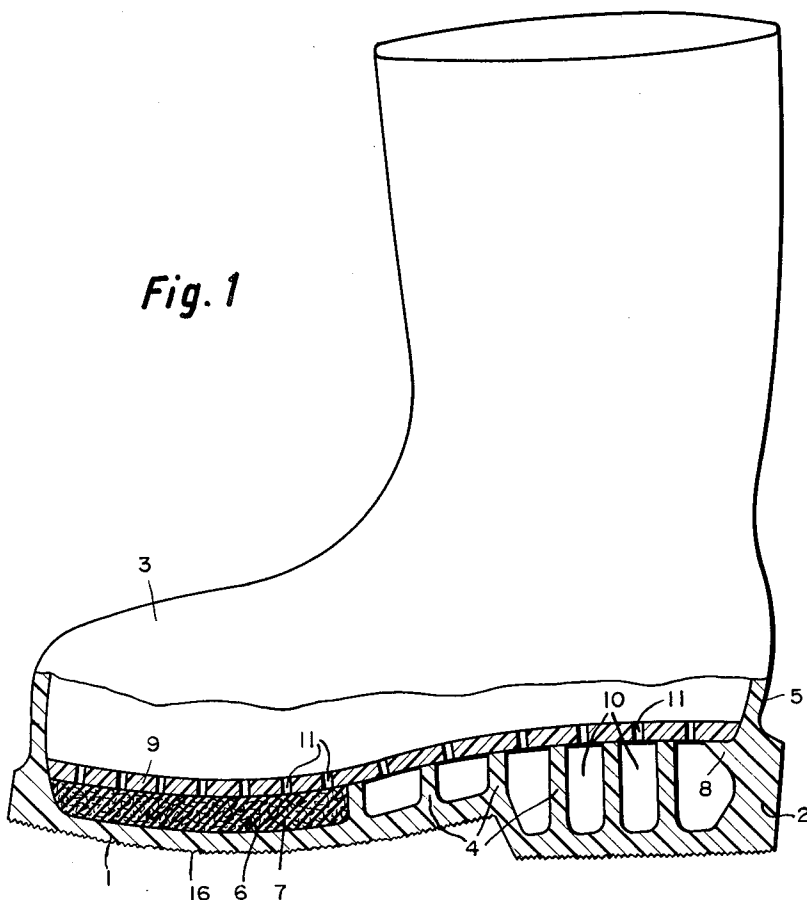
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VENTILATED WATER-TIGHT FOOTWEAR

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**VENTILATED WATER-TIGHT FOOTWEAR**

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4 Claims. (Cl. 36—3)

The invention relates to ventilated water-tight footwear and more particularly to a boot or shoe outsole and the lower part of the upper fabricated of resilient thermoplastic material or rubber.

In certain occupations, where work must be done largely in water and mud, an absolutely water-tight working boot or thigh boot of elastomer material has been for some time an absolutely essential foot covering, and this type of boot is necessary above all for workers on such as land, foresters, builders, road workers, miners, butchers, dairy workers, hunters, fishermen, etc.

More recently, in addition to the known rubber boot, boots and thigh boots of thermoplastic material have attained a great interest for such purposes.

All of the above-mentioned waterproof boots of rubber or plastic are objectionable in that the comfort of the wearer thereof in practically all cases, is impaired by the lack of entry of air through the water-tight material of the article which leads to foot troubles, due to sweating and can lead to fungus diseases and bad circulation in the feet.

All prior attempts to overcome the injurious effects on the feet, such as by the use of absorbent socks, inner shoes of felt, insulating air-conveying inserts of porous sponge rubber or plastic, have in practice been found to be not entirely satisfactory. These measures may maintain the actual footwear discomfort within reasonable limits but do not overcome the causes, which substantially reside in the inadequate ventilation of the foot within the water and air-tight article.

Broadly, the invention comprises an article of footwear which overcomes the above deficiencies by including means effecting ventilation of all parts of the foot thereby making it impossible for an excessive sweating and dampness of the feet which is realized by having within the article a satisfactory atmosphere for the foot with respect to the moisture content and temperature of the air surrounding the foot.

The problem to be solved by the invention is accordingly to provide for an article of footwear including an outsole, heel and lower part of an upper of resilient thermoplastic material, means defining an air pumping effect in the area of the outsole and heel so that at each step sufficient air is set in motion to provide not only a proper ventilation within the article but also as far as possible an air exchange with the outside air.

More specifically, the invention comprehends an outsole, a heel and an integral upper embodying a space in the heel divided into air chambers by webs integrally formed with the sole and heel by injection molding or vulcanization and locating in a recess in the area of the ball of the foot a cushioning material, and a perforated inner sole of hard elastic material loosely located at the upper ends of the webs and the cushioning material.

Accordingly, the customary inner sole is omitted and the outsole and heel are in direct communication with the interior of the article. Means constituting elastically compressible air pumping chambers are formed by the part of the space of the outsole at the shank and heel divided by the webs and the perforated liner sole located above the outsole and heel with the upper ends of the webs and cushioning material serving as a pressure distributing intermediate layer between the foot constituting an air pump-

ing piston providing ventilation. The insole can be constructed as regards its upper side with the orthopedic viewpoint in mind.

By the present article of footwear, it is possible to ventilate the inside of the article so thoroughly by the pumping effect of the spaces of the outsole and heel compressed on each step of the wearer that the heretofore unavoidable footwear discomfort can be avoided. The present footwear article can also be produced without difficulty in rubber at a relatively inexpensive cost.

If it is not desired to eliminate the use of the usual materials employed in footwear, such as leather or canvas, the outsole and heel can still be utilized.

In such situation, the upper is not fully shaped but terminates in an upper limit to which the remainder of the upper which can be of leather, canvas or like material can be fixed by sewing, glueing or vulcanization.

The particular advantage of the outsole and heel of the invention resides in the specially great ventilation action which keeps the feet in a healthy condition, and in a considerable saving of expensive upper materials by the use of uppers of leather, as well as a saving in numerous processing operations for the production of the customary articles of this type.

Further objects and advantages of the invention will become more readily apparent from the following detailed description and annexed drawings, and in which drawings:

FIG. 1 is an elevational view of a boot with the outsole, heel and lower part of the upper being in cross-section, and

FIG. 2 is a vertical sectional view of the outsole, heel and lower part of an upper to which the remainder of an upper can be attached.

Referring to FIG. 1, there is illustrated an article of footwear including an outsole 1, a heel 2 and an upper 3. These components may be of resilient thermo-plastic material or rubber and it will be seen that the same constitute a unitary structure.

A plurality of axially spaced webs 4 are integral with and extend upwardly from the outsole 1 in the area of the shank of the article and from the heel 2. The upper ends of the webs 4 terminate at approximately what may be termed the juncture between the outsole, heel and upper as indicated at 5. A relatively large space 6 located beneath the ball of the foot is provided between the forwardmost web 4 and the toe of the article and is filled with a spongy rubber cushioning material 7.

An inwardly directed support ledge 8 is preferably integrally formed on the heel 2. A freely disposed insole 9 of hard elastic material precisely fits the configuration of the juncture 5 and rests on the ledge 8, the upper ends of the webs 4 and the cushioning material 7. Thus, it will be appreciated that the webs 4, the shank portion of the outsole and the heel together with the insole 9 provide a series of small spaces 10 constituting air chambers. The insole 9 is formed with apertures or perforations 11 which communicate with the large space 6 and the small spaces 10.

With reference to the embodiment disclosed in FIG. 2 wherein corresponding parts bear similar reference numerals except the same are primed, the article comprises outsole 1', heel 2' and upper 3'. However, in this article, the upper is not complete and terminates in a circumferential flange 12 and a shoulder 13. The remainder of the upper (not shown) which may be of any desired material, is attached to the flange and shoulder in any convenient or suitable fashion such as by sewing, glueing, welding or vulcanizing.

In lieu of the insole 9 shown in FIGURE 1, an orthopedic perforated insole 14 embodying a heel pad and arch support 15 is loosely positioned on the upper ends of the

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webs 4', the cushioning material 7' and the inwardly directed ledge 8'.

In both FIGS. 1 and 2, it will be seen that the tread surface of the outsole and heel can be suitably profiled as at 16 and 16', respectively, such as with anti-slip surfaces.

The invention is not to be confined to any strict conformity to the showings in the drawings but changes or modifications may be made therein so long as such changes or modifications mark no material departure from the spirit and scope of the appended claims.

I claim:

1. A water-tight ventilated article of footwear comprising an integral outsole, heel and at least a part upper of resilient material, said outsole having shank, ball and toe portions, a plurality of axially spaced webs extending upwardly from the shank portion of the outsole and the heel providing a large space between the toe portion and shank portion and a series of relatively small spaces in the shank portion and heel, sponge rubber filling said large space, an insole of hard elastic material positioned on the upper surface of the sponge rubber filling and the upper ends of the webs with said insole and small spaces coacting to provide air chambers, and said insole having perforations therein leading to the air chambers in said shank portion and heel whereby said chambers communicate only with the interior of said part upper.

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2. The article of footwear as claimed in claim 1 in which at least the heel is provided with an inwardly directed ledge at approximately the same level as the upper ends of the webs for supporting the insole.

3. The article of footwear as claimed in claim 1 in which said part upper is provided with peripheral flange means constituting a shoulder adapted to have the remainder of the material forming a complete upper secured thereto.

4. The article of footwear as claimed in claim 1 in which the upper surface of said insole is provided with an arch support and heel pad.

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