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VENTILATED SHOE SOLE AND ART OF FABRICATING INTO SHOE STRUCTURES

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1 Claim. (Cl. 36—3)

This invention relates to certain improvements in air tread or ventilated sole shoes and particularly to improvements in their structure whereby certain economies in their manufacture may be effected and decrease in weight made possible.

In the accompanying drawing:

Fig. 1 is a view of the upper surface of a sole for such a shoe, its upper structure being omitted for simplification.

Fig. 2 is a bottom view of an upper tread member before assembly.

Fig. 3 is a fragmentary longitudinally sectioned view of a shoe sole in process of construction, the bent toe section being indicated in dotted lines and the flattened toe in solid lines.

Fig. 4 shows a transverse section through a sole on the indicated line 4—4, of Fig. 1, and

Fig. 5 is a transverse section through a shoe made with such a sole.

Referring to the accompanying drawing by numerals, 1 indicates the bottom sole of the shoe, and 2 the upper. My shoes are made with a leather innersole 3 ribbed as at 4 and usually gemmed as at 5. The innersole 3 may be of light stock as it is reinforced by another leather sole member 3' which overlies the stitching 4' of the rib 4 and is cemented to its companion member 3 so as to form, in effect, a reinforced innersole unit perforated to provide the air passages or vents 11. The rib 4 spaces the innersole unit upwardly from the bottom sole 1. This rib is a fabric strip, which has had a precoating of cement, and is stitched down its longitudinal center to the innersole member 3, the innersole member 3' overlying and covering the stitching 4' as shown in Figs. 4 and 5. The strip is folded downwardly on the line of stitching 4' and the parallel downturned sections enclose an area over the outsole 1 in which is disposed my air tread filler member 6. This filler 6 preferably consists of spongelike resilient material the pores of which are filled with air. The pressure of the foot causes this material to expel air which passes up through the vents 11 to and around the foot itself, and as pressure shifts, fresh air is drawn down through these vents 11 beneath the fore part and arch of the foot.

To supplement the alternate compression and release of the filler 6 and to extend both the compression and ventilation features throughout the remainder of the arch region and into the heel region of the shoe, I provide the cushion tread member 12 which lies over the innersole unit 3, 3' in the area extending from substantially the

metatarsal region of the shoe back to and including the heel.

This cushion tread member 12 is provided with alternate longitudinally extending grooves 12' and beads 12². Its lower surface is cemented to the upper surface of the innersole member 3, and over its upper face is a perforated lining or cover 7. When the beads 12² are compressed by the wearer's weight, the air in the filler 6 is sucked away from the ball of the foot and redistributed, every step or movement of the foot in the shoe forcing old air out and drawing fresh air into the cells of the filler 6 and the grooves 12' of the cushion member 12.

Reference to Fig. 3 of the drawing will indicate that both the air tread resilient member 6 and the ventilated cushion member 12 extend throughout the arch region of the shoe, thus providing not only desirable reinforcement and cushioning in this delicate and readily tired area of the foot, but also ensuring a free passage of air throughout the shoe in this area.

Soles according to my invention can be lasted with suitable uppers. It is usually more convenient practice to insert the cushion tread member 12 after the shoe has had its outer sole 1 suitably fastened to the innersole and upper assembly, but it may be attached to the sole member 3—3' to make it a unit in handling.

One difficulty heretofore experienced in the use of an extra layer in shoe soles was that they tended to wrinkle or blister at the toe when being lasted.

According to my concept I deliberately make the end or tip of the inner portion 3' slightly shorter than its underlying member 3, as appears in the full lines in Fig. 3. My innersole members 3' and 3 being initially uncemented I give them a deliberate bend cemented and set in a curved block having the upward curve or relief of the last to which the shoe sole is to be applied. This equalizes the relative or effective lengths of the innersole members 3 and 3' as indicated in Fig. 3 in dotted lines. In this figure the difference in initial length appears in the portion shown in solid line, while their bent and cemented relation is indicated in dotted line. This bent form or curvature is that of the last to which it is to be applied in making the shoe so that the shoe may be fabricated with this critical toe area ready for anchoring. My soles are therefore preformed or pre-bent before lasting and before the upper 2 has been pulled-over and sewed through the substance of the rib or bead 4 which anchors the sole parts in their proper bent and stressed por-

tion. This is effected without wrinkling or blistering.

The cement coated rib 4 is fabricated into the shoe structure as by stitching to a welt or like member which in turn is contoured to follow the outline of the shoe sole 1. Such structure enables a shoe with its preformed innersole to hold shape even when stripped from the last in a comparatively green state. This enables the manufacturer to keep lasts turning over as frequently as possible to save the enormous expense of extra last equipment.

I am aware that two-part rubber inner members have been patented for air tread soles, but such molded members are apt to add undesirable weight and complicate the processing of the shoes.

According to my improvement, ventilation through the ball contacting area of the sole is primarily induced by the compression of the spongy filling 6 which delivers air direct to the shoe interior under the alternate compression and relief of each completed step. The supplementary action of the internal tread is above the upper surface of the leather sole member at shank and heel zones, through apertures 7¹ and 7² in the cover 7 communicating with the grooves 12² of the member 12.

While I utilize certain old features of the prior art, my invention combines them in novel relation both structurally and as an improved basis of factory production.

What I therefore claim and desire to secure by Letters Patent is:

A shoe comprising an upper, an outsole, an insole, a filler between said outsole and insole and extending from the fore part of the shoe a substantial distance rearwardly, and a multilayer cushioning unit overlying said insole and comprising a bottom layer, an intermediate layer and a top layer, said insole and said bottom layer being coextensive with the outsole and having registering perforations in the areas thereof which overlie said filler, said intermediate layer and said top layer extending from the heel of the shoe forwardly to a point where they overlap a portion of the filler, said intermediate layer being of resilient material and having spaced longitudinal ribs on its top face contacting the lower face of said top layer and defining therein longitudinal air passages, and said top layer having perforations communicating with said passages.

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