Nov. 23, 1943. M. MARGOLIN 2,334,719

RESILIENT MIDDLE SOLE OR INSOLE

Filed Nov. 22, 1940

Fig. 1

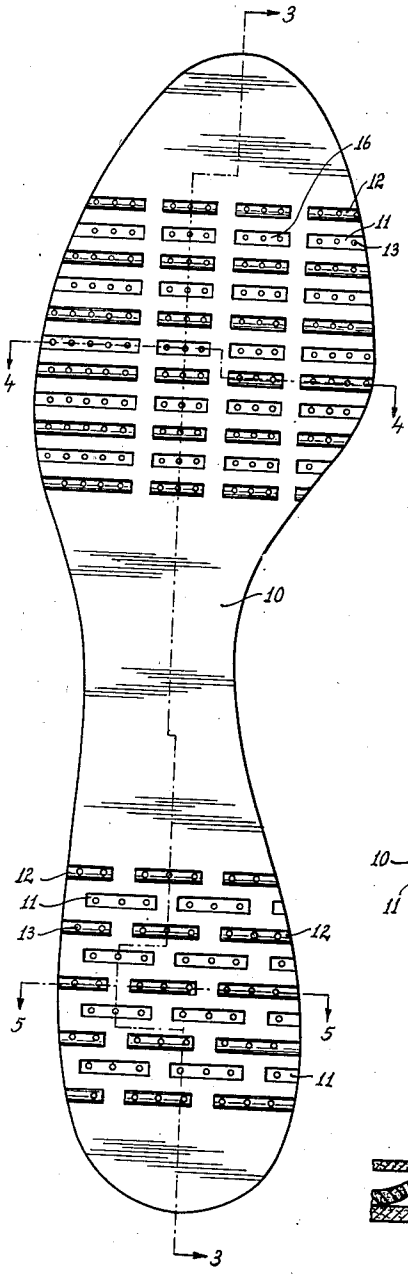


Fig. 2

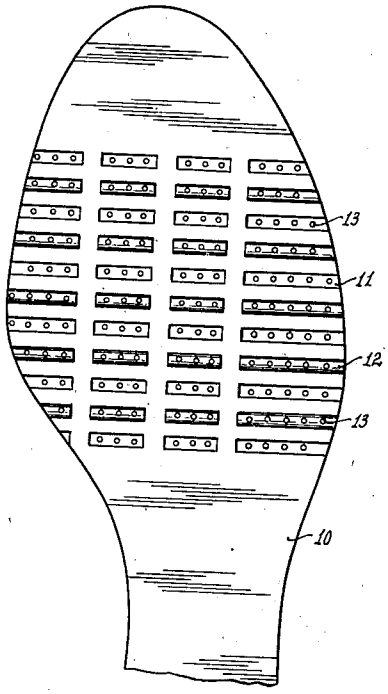
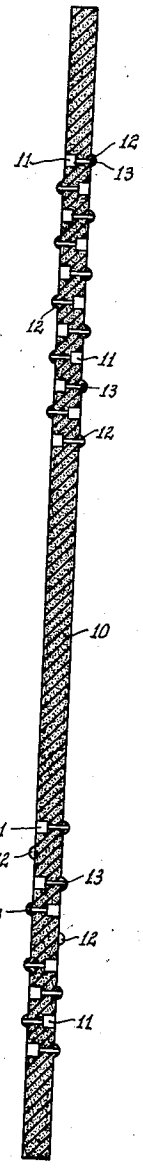


Fig. 3



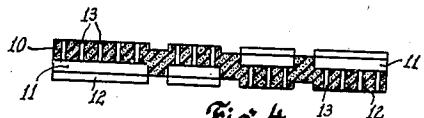


Fig. 4

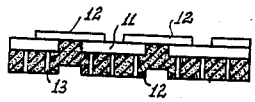


Fig. 5

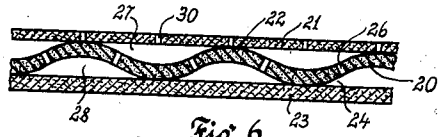


Fig. 6

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UNITED STATES PATENT OFFICE

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RESILIENT MIDDLE SOLE OR INSOLE

Meyer Margolin, Elgin, Ill.

Application November 22, 1940, Serial No. 366,573

2 Claims. (Cl. 36—3)

My invention relates to a novel middle sole or insole designed to produce increased foot comfort and forced breathing within the shoe. My invention more particularly relates to a middle sole or insole having grooves and projections on both sides thereof so that increased forced breathing effects are obtained by the flexing of the grooves described. My invention further relates to a novel middle sole or insole in the form of a corrugated resilient sheet having perforations therethrough in the middle of the curves of said corrugations, which middle sole is adapted to be positioned between an outsole and an inner sole.

The advantages of increased foot comfort have long been recognized. It has been particularly desirable to increase the air circulation within the shoe and to increase the springiness and flexibility of the walking surface of the shoe.

I have now conceived of a novel construction by means of which such increased resilience and flexibility and forced breathing effects are obtained.

It is the object of my invention to provide a novel middle sole formed so as to cause forced breathing and to provide increased resilience and flexibility for the foot.

It is a further object of my invention to provide a novel middle sole or insole consisting of a resilient material having grooves and raised portions contained on both sides thereof, to cause forced breathing effects when pressure is exerted thereon.

It is a further object of my invention to provide a novel middle sole or insole in the form of corrugated resilient sheet material having perforations therethrough.

Further objects of my invention will be apparent from a consideration of the drawing and description thereof which here follows:

Figure 1 is a bottom view of the middle sole of my invention.

Figure 2 is a plan view showing the reverse side of the upper portion of the middle sole shown in Figure 1.

Figure 3 is a cross section along the line 3—3 of Figure 1.

Figure 4 is a cross section along the line 4—4 of Figure 1.

Figure 5 is a cross section along the line 5—5 of Figure 1.

Figure 6 is a modified form of my invention.

Referring now more particularly to the drawing, in Figure 1 I show a middle sole 10 in which are disposed grooves 11 and raised projections or bars 12. Passing through the middle sole 10 and affording communication between the grooves 11 and the oppositely disposed portion of the middle sole are perforations 13. In walking the compression of the projections 12 by the weight of the foot or the pressure of the outsole in turn causes the compression of the grooves 11 forcing air therefrom into the interior portion of the shoe. By reason of the multiplicity of projections 12 and grooves 11 a well dispersed forced breathing effect is obtained within the shoe. It will be noted that the grooves and projections are in staggered relation one to the other and a well balanced resilience is afforded by this construction. It is within the purview of my invention, however, to provide grooves on one side only and projections on the opposite side. When the projections 12 face upwardly they come in contact either with an insole or with a suitable cover member so that there is no discomfort to the foot by reason of their shape.

I intend to include within the scope of my invention not only the spaced projections and grooves as shown in Figures 1 and 2 but the projections and grooves may be continuous across the width of the middle sole. Further the projections may be in any desired form suitable for obtaining the best breathing and resilient effects.

Although I prefer that the grooves 13 have a substantially rectangular cross section they may be of other shapes and the grooves may be closed at both ends, as for example groove 15, or the grooves may be open at the end or ends.

It is further within the purview of my invention to provide that the construction shown in Figures 1, 2 and 5 and described above be employed in an insole in which case a lap is provided around the peripheral edge of 10, which lap may be attached to a cut out insole as described in my Patent No. 2,153,021 and 2,207,632, and my co-pending applications Serial No. 257,351, Serial No. 290,559, and 306,778.

In the middle sole or insole which I have described there is a certain amount of breathing effect obtained by the flexing of the resilient member 10 which in turn compresses and decompresses the grooves 11 and the compression of the projections 12 increases this compressing and decompressing effect and therefore increases the forced breathing effects.

When the construction above described is used as a middle sole then the superimposed insole should be perforated or of such construction so that it permits the passage of air from the grooves into the interior of the shoe. When the projection and groove construction described is em-

ployed in the form of an insole then the cover of the insole should be air permeable to permit the passage of air therethrough.

My novel construction of the staggered projections and grooves may be employed either in the forepart or the heel portion or in both the forepart and the heel portion of the shoe.

As a resilient material for the formation of the body of my middle sole or insole I prefer to employ expanded rubber either of the open cell or closed cell type. Although I have shown perforations as located in the grooves, it is also within the purview of my invention to locate the perforations outside the grooves in which case the perforations extend through the middle sole or insole adjacent to the grooves and projections to permit the passage of air therethrough.

By shaping the projections as shown with a rounded extremity, I get an increased resilient effect because there is increased give to the projection. As the projection is compressed by the pressure of the foot and the outsole, air is also compressed within the passage or perforation 13 and the groove 11.

In the modified form of my invention shown in Figure 6 I provide a middle sole 20 in the form of a corrugated sheet of resilient material such as gas expanded rubber. The middle sole 20 engages an insole 21 at the upper portion 22 of the middle sole 20 and the middle sole 20 engages the outsole 23 at the lower portion 24 of the middle sole 20. Perforations 26 are provided in the middle sole 20. In walking the resilient wave-like or corrugated middle sole 20 is compressed between the insole 21 and the outsole 23, and the air in the pockets 27 and 28 is compressed and forced through the perforations 30 in the inner sole 21. Perforations 26 and 30 provide for the free passage of air resulting from the compression of the middle sole from the middle sole 20 to the interior of the shoe above the insole 21. The middle sole 20 is of the proper resilience and is suitably corrugated so that the pockets 27 and 28 are of such size to provide the optimum forced breathing effects and the middle sole 20 has sufficient resistance to provide the proper spring-like resilience for the foot.

The new construction above set forth for a middle sole or insole is particularly valuable in men's shoes because of the welt construction and because the novel construction of my invention is adapted to support the heavy weight involved. In the case of men's shoes the middle layer is employed with the grooves and projections from heel to toe. When used in men's shoes the thickness of the middle sole is uniform, while in women's shoes the center portion is thicker and the edges are thinner and taper to a fine edge to obtain the rounded bottom shoe effect.

This insert or filler having a thicker central portion and thinner and tapering edge portion may be employed in a shoe made for example by the Sbicca process in which the insole is split off from the outsole. When there is a raised portion or hump on the outsole the insert or filler may be dished or hollowed out to fit over this raised portion or hump.

It is understood that the middle sole construction described herein can be employed either as a middle sole or as an insole and when employed as an insole can be used per se or in the form of an insert in a cut out insole as described in my patents and applications above set forth.

I claim:

1. A resilient insole having a ball portion, a toe portion and a shank portion, the toe portion and the shank portion having the same thickness, the ball portion having projections in the form of bars extending above the upper plane of said insole and projections in the form of bars extending below the lower plane of said insole, and grooves having spaced lateral walls, said grooves being juxtapositioned with respect to the bars on both sides of said insole, and perforations extending through said ball portion to afford ventilation between both sides of said ball portion.

2. A resilient insole having a ball portion, a toe portion and a shank portion, the toe portion and the shank portion having the same thickness, the ball portion having projections in the form of rows of bars spaced laterally extending above the upper plane of said insole and projections in the form of rows of bars spaced laterally extending below the lower plane of said insole and grooves having spaced lateral walls, said grooves being juxtapositioned with respect to the bars on both sides of said insole, and perforations extending through said ball portion to afford ventilation between both sides of said ball portion.

MEYER MARGOLIN.