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SHOE CONSTRUCTION WITH RESILIENT HEEL AND ARCH SUPPORT

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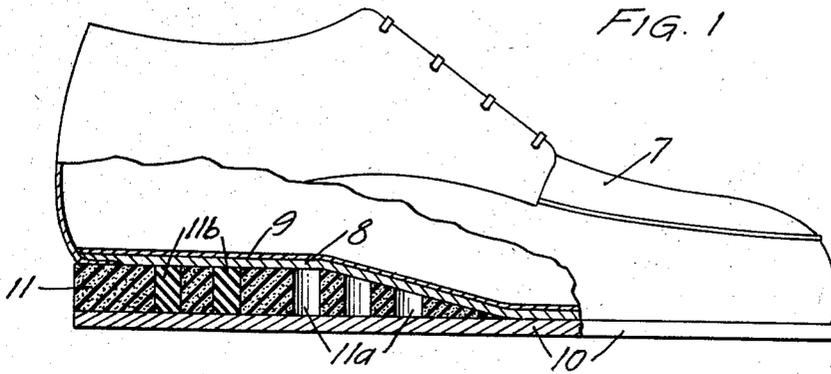


FIG. 2

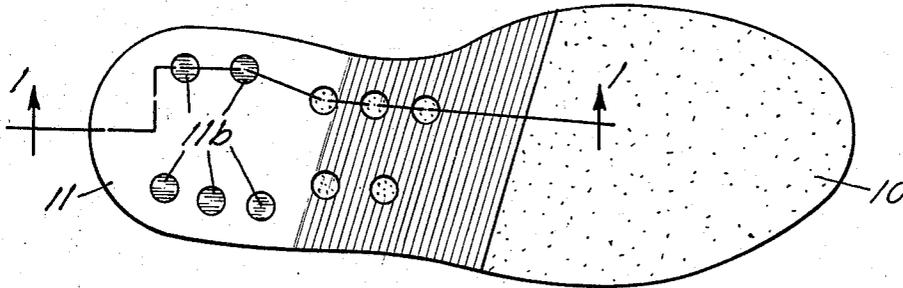


FIG. 3

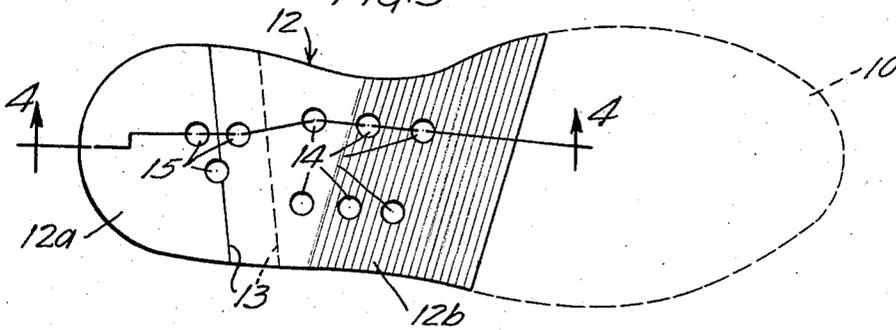
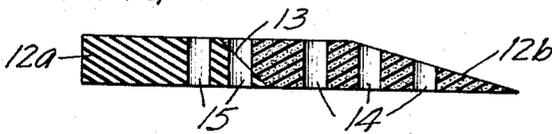


FIG. 4



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SHOE CONSTRUCTION WITH RESILIENT HEEL AND ARCH SUPPORT

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4 Claims. (Cl. 36—2.5)

This invention relates to a shoe construction and particularly to a shoe having a generally wedge shaped insert between the heel and arch sections of the insole and outer sole.

In the past various types of comfort shoes have been constructed but none has been specifically designed to provide a differential in the yieldability between certain selected areas thereof. Much of the foot fatigue encountered by people who are on their feet a great deal is caused by lack of proper cushioning of the foot, particularly the central heel portion and the arch section. The arch section should be sufficiently yieldable to permit up and down action of the wearer's arch while providing substantial underlying support therefor.

Therefore, it is an object of my present invention to provide a shoe specifically constructed to cushion the central portion of the heel of the wearer while providing the desired lateral support for the heel.

It is another object to provide a shoe specifically constructed to provide resilient arch support while permitting up and down movement of the arch of the foot.

More specifically it is an object to provide a shoe having a wedge portion interposed between the heel and arch sections of the insole and outer sole wherein the angle of the wedge shaped clog portion is between 17 and 20 degrees depending upon the foot size of the wearer and wherein the upper plane of the wedge shaped portion extends forwardly a greater distance on the inside toward the ball of the foot than it does on the outside thereof.

These and other objects and advantages of my invention will more fully appear from the following description, made in connection with the accompanying drawings, wherein like reference characters refer to the same or similar parts throughout the several views, and in which:

Fig. 1 is a side elevation of a shoe embodying my invention with a portion thereof broken away substantially along the line 1—1 of Fig. 2;

Fig. 2 is a top plan view of the sole assembly with the insole removed, of the shoe shown in Fig. 1;

Fig. 3 is a top plan view of a modified form of sole assembly also with the insole removed; and,

Fig. 4 is a longitudinal vertical sectional view taken substantially along the line 4—4 of Fig. 3.

As illustrated in the accompanying drawings I provide a shoe construction having an upper 7 made from any suitable material such as leather, an insole 8 to which in the form shown the upper 7 is securely anchored, and insole liner 9 provided on the inside surface of the insole 8. An outer sole 10 of any suitable material such as composition or leather is connected with the midsole at its forward portion but has its rear portion at its arch and heel portion spaced downwardly from the midsole as best shown in Fig. 1.

A wedge designated as an entirety by the numeral 11 is interposed between the spaced heel and arch portions of the midsole and outer sole. In the forms of my in-

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vention illustrated this wedge is constructed of relatively yieldable resilient material such as neoprene crepe rubber composition having a specific gravity of between 3 and 7 although obviously other yieldable resilient materials could be found which would produce satisfactory results. The entire wedge is designed to provide sufficient yieldability to cushion the central heel portion of the wearer's foot as well as permitting substantial up and down action of the arch of the foot. It is usually desirable to increase the yieldability of the arch portion by any suitable means such as providing a pair of rows of openings 11a therein in closely spaced relation to the longitudinal center line of the wedge 11 as best shown in Fig. 2.

I have found that where the wedge 11 is sufficiently yieldable to provide the necessary cushioning for the heel of the wearer, that said material is excessively soft to provide the necessary stability for the lateral portion of the heel. Therefore suitable means must be provided for increasing the stiffness of the heel area surrounding the central heel bone and I have found that inserting a plurality of spaced plug elements 11b into suitable openings works very satisfactorily for this purpose. The plug elements 11b are of course less yieldable than is the material from which the wedge 11 is constructed.

In Figs. 3 and 4 an alternative form of my invention is illustrated wherein two pieces of yieldable resilient material are spliced together across the forward portion of the heel area to provide a differential between the yieldability of the heel section and the arch sections of the wedge which in this form of my invention is designated by the numeral 12. The heel section 12a is less yieldable than the arch section 12b to which the same is spliced as indicated along the splice line 13. To increase the yieldability of the arch section a plurality of weakening apertures such as the apertures 14 may be provided in a pair of rows transversely spaced outwardly from the longitudinal center line of the shoe as best shown in Fig. 3.

As illustrated in Figs. 3 and 4 the central portion of the heel area underlying the heel bone of the wearer's foot is also weakened by a plurality of apertures 15 so as to provide the necessary cushion for the heel bone.

It is apparent that both forms of my invention are designed to provide the desired stability for the heel area of the wearer's foot while providing the desired cushioning effect for the central portion thereof underlying the heel bone of the foot. It should be noted that in the walking operation the first point of contact between the shoe and the supporting surface is the rear extremity of the heel of the shoe. If this is sufficiently yieldable to permit initial compaction thereof, it is apparent that considerable cushioning effect will be produced thereby. In both forms of my invention the wedge is sufficiently yieldable to provide this initial cushioning function although obviously the form of the invention illustrated in Figs. 1 and 2 being somewhat softer will provide more cushion than will the form of the invention illustrated in Figs. 3 and 4.

It will be seen that I have provided a relatively simple yet highly efficient shoe construction which is particularly adapted to cushion the heel bone area of the foot while providing the necessary lateral support under the areas of the heel surrounding said heel bone. The arch portion of the wedge also must be sufficiently yieldable to permit action of the metatarsal area of the foot during walking.

I have found that the angle of taper of the wedge should be between 17 and 20 degrees relative to the horizontal for best results. The smaller the foot, the less the angle of inclination within the foregoing range. I have also found that by extending the leading or forward feather edge of the wedge forwardly at the inside portion thereof

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as best shown in Figs. 2 and 3, I provide additional support for the inside arch of the foot in closely spaced relation rearwardly of the ball of the foot. The angle at which this forward feather edge of the wedge 11 is disposed relative to a line normal to the longitudinal center line of the shoe is approximately 8 to 10 degrees to produce the best results.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts without departing from the scope of my invention which consists of the matter shown and described herein and set forth in the appended claims.

What is claimed is:

1. A shoe construction comprising an outer sole layer, an insole layer with the rear portion thereof spaced above the outer sole, a resiliently compressible wedge interposed between the rear portion of the insole and outer sole to underlie the heel and arch of the wearer's foot and provide cushioning support therefor, the central portion of the heel area of the wedge being more compressible than selected surrounding areas thereof to provide cushioning means for the central heel bone while stabilizing the lateral heel area of the wearer's foot when the shoe is in use.

2. A shoe construction comprising an outer sole, an insole having the rear portion thereof spaced above the outer sole, a resiliently compressible wedge disposed between the spaced portions of the insole and outer sole in underlying relation to the heel and arch portions of the wearer's foot, stiffening means provided in selected portion of the heel area around the central portion thereof to provide stability for the wearer's heel whereby the central portion of the wedge will cushion the heel bone and the stiffened outer portion will stabilize the outer area of the heel of the wearer's foot.

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3. A shoe construction comprising an outer sole layer, an insole layer having the arch and heel portion spaced above the underlying outer sole layer and a resiliently compressible wedge interposed between the spaced portions of the insole and outer sole to stably support the lateral portions of the heel of a wearer, the central heel portion of the wedge having apertures therein to increase the compressibility thereof and cushion the central heel bone of the wearer when the shoe is in use.

4. A shoe construction comprising an outer sole layer, an inner sole layer having arch and heel portion spaced above the underlying outer sole layer, and a resiliently compressible wedge interposed between the outer sole and the inner sole and being formed from two interconnected sections, a heel section and an arch section, said arch section being made from a material more readily compressible than the heel section to provide stability and support for the lateral portions of the heel of the wearer, the central portion of the heel portion of the wedge having apertures therein to increase the compressibility thereof and cushion the heel bone of the wearer, and the central area of the arch section having apertures therein to increase the yieldability thereof and permit up and down action of the arch portion of the wearer's foot.

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