March 27, 1951 A. LAVINTHAL 2,546,827

ARCH SUPPORTING DEVICE

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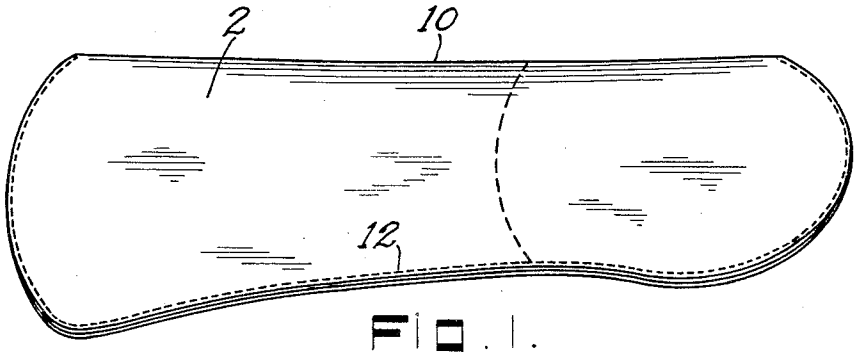


Fig. 1.

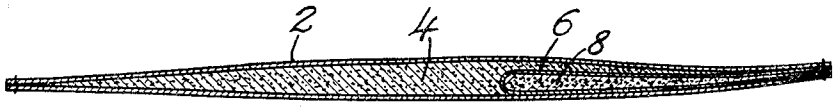


Fig. 2.

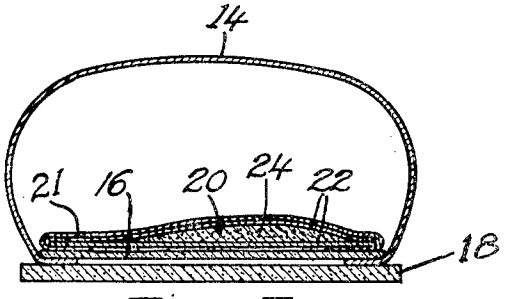


Fig. 3.

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ARCH SUPPORTING DEVICE

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3 Claims. (Cl. 36—71)

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This invention relates to arch supports for footwear and is directed particularly to constructions wherein the arch support presents a permanently deformable and elastic surface for support of a wearer's foot.

Many types of arch supports have been developed heretofore but those supports which are formed of metal, leather, or other substantially rigid material are not always satisfactory, and in particular they are uncomfortable for persons having tender or sore spots on the sole of the foot. It has been suggested that arch supports may be made of plastic material which is molded to the contour of the person's foot but such supports are not sufficiently elastic or deformable during use to afford the necessary comfort and support for the wearer.

In accordance with the present invention, an arch support is provided which may be in the form of a separate arch supporting member for insertion into a shoe, or the arch supporting device may be incorporated permanently in a shoe or other footwear if desired. Arch supports embodying the present invention are not only deformable to accommodate the sole of the wearer's foot when first used, but are permanently deformable so that as the wearer shifts his weight in walking or standing, the device is deformable to afford the desired support without imposing undue pressure or discomfort to the foot. Further in accordance with the present invention, the arch support is resilient so that the shoe or insert will provide a yielding and springy surface which affords the greatest comfort to the wearer.

These results and advantages of the present invention are preferably attained by providing arch supporting means in the form of a closed flexible casing within which is located a permanently plastic but resilient composition. A typical and preferred composition of this character is a silicone compound of the type frequently referred to as "bouncing putty."

One of the objects of the present invention is to provide a novel type of arch support for footwear which presents a deformable surface.

Another object of the invention is to provide an arch support which is permanently deformable so as to adjust itself to the contour of the user's foot as the weight is shifted during use.

A further object of the present invention is to provide a permanently deformable arch support which possesses resiliency.

A particular object of the present invention is to provide an arch support for footwear embodying "bouncing putty."

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These and other objects and features of the present invention will appear from the following description thereof in which reference is made to the figures of the accompanying drawing.

In the drawing:

Fig. 1 is a perspective of a typical form of arch support embodying the present invention.

Fig. 2 is a longitudinal sectional view through the arch support illustrated in Fig. 1; and

Fig. 3 is a transverse sectional view through a shoe embodying an arch support in accordance with the present invention.

In that form of the invention illustrated in Figs. 1 and 2, the arch support is in the form of a removable insert which may be applied to footwear and removed for use in different shoes or footwear whereas that form of the invention illustrated in Fig. 3 is designed to be permanently secured to the footwear as an integral part thereof.

The arch support shown in Figs. 1 and 2 includes an outer cover 2 formed of flexible material such as leather, leatherette, or plastic or resinous sheet material such as polyvinyl chloride (Koroseal). However fabric material may be employed in forming the outer cover, particularly if such materials are provided with a waterproofing coat. Within the cover 2 is located a permanently plastic composition 4 and preferably one which possesses resiliency. The preferred material employed for this purpose is the composition known as "bouncing putty" which is a silicone compound such as dimethyl silicone, to which inert fillers may or may not be added. Such silicone compositions are characterized by the fact that they are relatively fluid and of a general putty-like character and yet they possess resiliency when struck or suddenly compressed. In fact they have such remarkable resiliency that they are used as the centers of golf balls, as shock absorbers for instrument mountings and elsewhere where permanent and high resiliency is required.

By the use of a composition having such resiliency as well as plasticity, in combination with the flexible cover 2, the arch support permits flow or limited movement of the composition within the cover to adjust itself to the contour of a wearer's foot. However during walking the composition serves to provide the desired and characteristic resiliency and spring which has heretofore been attained only by the use of rubber and similar non-fluid elastic materials.

In a preferred form of the present invention, the plastic composition located within the cover

2 is divided into relatively restricted areas of movement. As shown in Fig. 2, a separate insert 6 in the form of a casing is provided and a silicone composition 8 is contained within the casing. A further body of silicone composition 4 within the outer cover 2 is also employed so that there are two separate compartments or zones within which the plastic composition is movable. It will be apparent from Fig. 2 that one such zone or compartment may be located within a larger zone so that there is no sharp line of demarcation between the zones which would tend to present a ridge or recess between adjacent zones. Any number of separate casings 6 may be employed but in practice it has been found that one such inner casing located adjacent the heel portion of the arch support is generally sufficient to maintain the desired form for insuring comfort to the wearer. By using such compartments or casings, excess or undesired flow or movement of the plastic composition is avoided and yet the surface of the device is sufficiently deformable to assure both comfort and support to the wearer's foot.

In forming the arch support shown in Figs. 1 and 2, the outer cover 2 is preferably formed from a single piece of material within which the casing 6 and the plastic composition 4 are first located. The cover 2 is then folded along the outer edge 10 and secured together as indicated at 12 about the edges of the cover to form a permanent enclosure for the plastic material. The securing means 12 may consist of closely placed stitches but various bonding agents are employed and when the cover is formed of a thermoplastic material, the bond 12 may be formed by heat sealing the edges of the cover.

In that form of the invention illustrated in Fig. 3 the arch support is embodied in a shoe as a permanent part of the sole. For this purpose the shoe is provided with an upper 14, an insole 16, an outsole 18, and the arch supporting device is located at 20 between the insole 16 and the sock liner 24. The arch supporting device in this assembly preferably has a cover 22 which may be similar to that of the arch supporting device illustrated in Figs. 1 and 2. Further, the arch support may include one or more casings 6 similar to that shown and described in Fig. 2. The plastic composition 24 contained within the cover 22 of the construction shown in Fig. 3 preferably has the characteristics of "bouncing putty" so that the resulting shoe presents a deformable but resilient surface for engagement with the sole of the user's foot and at the same time the shoe affords the required support at the arch or in other desired areas for insuring comfort to the wearer.

It will be apparent that arch supports embodying the present invention may have many different shapes and forms and the type of cover material employed may be varied considerably.

Similarly, the shape and arrangement of separate compartments or casings within the arch support may be varied to adapt the device for use in orthopaedic shoes or for insertion into shoes worn by persons having unusual foot conditions. Furthermore, although I prefer to employ silicone products as the plastic composition, other materials being developed in the industry and having the characteristics of "bouncing putty" may be substituted for or used in combination with silicones. It will further be apparent that one or more of the compartments such as the casing 6 of Fig. 2 may contain rubber, cork, or other material for use in combination with silicones or similar plastics or cushioning materials to afford various desired supporting surfaces and conditions for use in arch supporting inserts or shoes.

In view thereof, it will be apparent that the present invention is capable of many modifications and changes and it should therefore be understood that the particular embodiments of the invention shown in the drawings and herein described are intended to be illustrative only and are not intended to limit the scope of the invention.

I claim:

1. An arch supporting device comprising means forming an enclosure presenting a flexible surface engageable by the foot of a wearer and containing dimethyl silicone.

2. An arch supporting device for insertion in a shoe comprising two flexible members seamed along their edges and forming an enclosure presenting a flexible surface engageable by the foot of a wearer and containing a silicone compound which is resilient and has sufficient plasticity to flow in response to the weight of a wearer applied to said flexible surface and said enclosure having partition means forming separate compartments, at least one of said compartments having said silicone compound therein.

3. An arch supporting device comprising a fluid-tight enclosure formed of flexible plastic sheet material and containing a plurality of compartments therein, one of which substantially surrounds the other and has therein a dimethyl silicone compound which possesses resiliency and plasticity.

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