

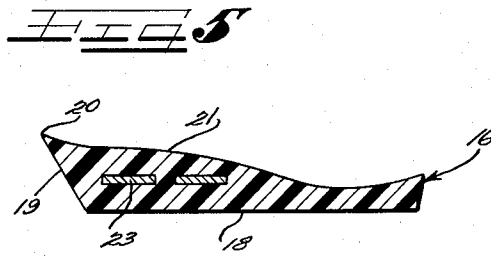
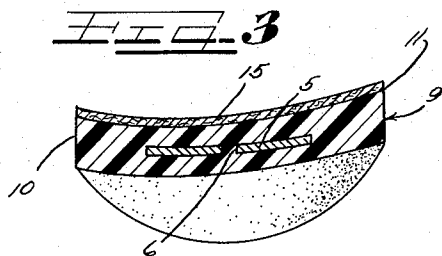
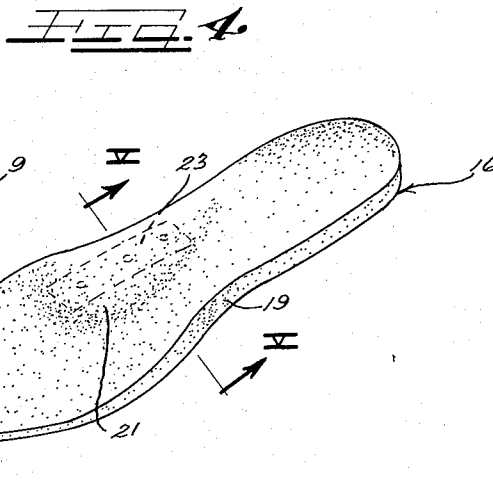
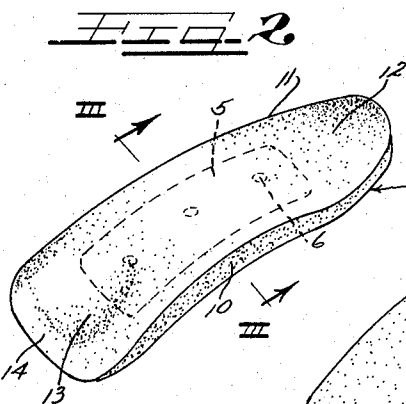
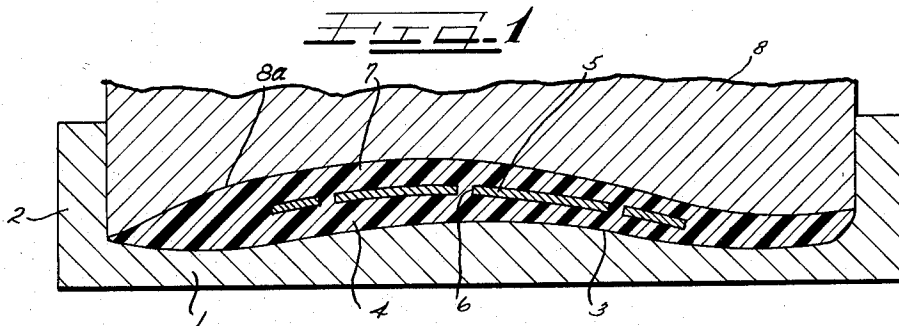
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SHOE INLAY

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3,244,177

SHOE INLAY

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1 Claim. (Cl. 128-595)

This invention relates to improvements in a shoe inlay, and more particularly to a molded shoe inlay that is resilient and foot supporting, the inlay being desirable for free disposition in an article of footwear in the manner an insole is placed therein, or if desired the inlay could be included in a shoe at the time of manufacture, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

Difficulty has been experienced in the past in providing light weight and foot conforming resilient arch supports, insoles, inlays, inserts and the like for disposition in shoes and other articles of footwear, both for standard shoes and for orthopedic shoes where special or custom fitting is required for a particular individual. With such inserts or inlays, economy of production is a prime factor, but adequate foot supporting qualities along with durability of the insert cannot be sacrificed. Preferably, and especially with orthopedic shoes where an individual may have such an affliction of the foot that it necessitates special fitting, the inserts are molded of a suitable composition.

It is therefore an important object of the instant invention to provide an inlay or insert for an article of footwear molded of suitable material in a manner so economical that inserts for standard shoes, as well as inserts for orthopedic shoes may be made by the same process.

Another object of this invention is the provision of an insert for an article of footwear, which may simply and economically be in the form of a foot conforming and supporting insole, a partial insole, or in the form of an arch support.

Also a feature of the invention is the provision of a resilient and light weight molded insert for an article of footwear.

A further feature of the invention is the provision of a molded insert for an article of footwear having reinforcing and arch supporting means of different material embedded within the insert.

Still another feature of the instant invention is the provision of a molded insert for articles of footwear, having an upper surface contoured in keeping with the plantar surface of a foot, and which insert may either be made and shaped with dies, or shaped by direct contact with the human foot.

While some of the more salient features, characteristics and advantages of the instant invention have been above set forth, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawing, in which:

FIGURE 1 is a fragmentary central vertical sectional view showing an inlay or insert embodying principles of the instant invention in the process of being manufactured;

FIGURE 2 is a perspective view of the completed insert;

FIGURE 3 is an enlarged transverse vertical sectional view through the insert taken substantially as indicated by the line III-III of FIGURE 2, looking in the direction of the arrows;

FIGURE 4 is a perspective view of an insert of somewhat different shape, also embodying principles of the instant invention; and

FIGURE 5 is a transverse vertical sectional view, enlarged, and taken substantially as indicated by the line V-V of FIGURE 4.

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As shown on the drawings:

A heat curable molding composition is utilized in the manufacture of the instant invention. Briefly, the composition includes particles of an emulsion polymerized polyvinyl chloride resin, or copolymers of the chloride in which the chloride predominates, dispersed in a liquid plasticizer in which the resin is insoluble at molding temperatures but which is capable of dispersing the resin at elevated temperatures, in combination with a gelling agent and a sufficient amount of cork particles to substantially reduce the specific gravity of the composition and also render it more resilient upon cooling from the dispersing temperature. The gelling agent may satisfactorily be an organophilic substance such as aminated bentonite, but silica aerogels and other suitable agents may also be utilized. The cork particles may be of the same size, but in most instances it is preferable to use a variety of sizes, because while larger cork particles make a very light composition, there may be some danger of the resultant inserts splitting if too large cork particles are utilized. In general, the average size of the cork particles will be in the range from about 8 to 14 mesh. The amount of cork particles may also vary between 10 and 50% by weight of the resin present.

A molding composition of this character will retain an impression of a die or of a human foot during the heat treatment. After shaping, while the composition is heated, a suitable time being 15 minutes at approximately 350° F., there is no chemical setting in the usual sense, but the plasticizer is effective to disperse the resin so that upon cooling from the elevated temperature the material sets without deformation of the impression, and becomes a resilient foot support suitable for insertion in an article of footwear.

By way of example, with reference to FIGURES 1, 2 and 3 of the drawings, I have first illustrated an insert of the character commonly referred to as an arch support. Such devices are manufactured in various shapes and sizes to fit different sizes and shapes of footwear, and commonly sold at the same time a pair of shoes or the like are purchased or at any other times for use in articles of footwear previously purchased.

In making the inlay of FIGURES 1, 2 and 3, a mold pan 1 is utilized, which pan is provided with relatively shallow upstanding side walls 2 therearound, and has a bottom formation 3 which is in keeping with the desired bottom structure of the inlay. In the instance of FIGURE 1, the bottom is higher in the central region than elsewhere so that the resultant inlay is upwardly bowed in the central portion to give better support to the longitudinal arch of the foot. A lower portion 4 of the molding composition, which may satisfactorily be in sheet form, is placed in the bottom of the mold pan. On this lower portion 4 an upwardly bowed reinforcing and arch supporting leaf spring 5 is placed. This spring member may be made of aluminum, if lightness is desired, but it can also be made of steel, brass, or any other durable and shape maintaining material. The spring 5 is provided with one or more apertures 6 therein so that it will be held in place by mold material passing through the apertures as clearly seen in FIGURE 1. After the spring has been positioned, an upper portion 7 of molding composition is placed on top of the spring member and over the exposed face of the first portion. Then a die 8 having a lower face 8a shaped in keeping with the plantar surface of a foot is impressed upon the mold material 7, causing the plate or spring 5 to become embedded within the mold material and uniting both the first and second portions of mold material into an integral mass. After the impression has been made the form thus produced may be heat treated to cure and set the composition either in the mold

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or out of the mold as may be desired since, as stated above, once the impression is made the ultimate heat curing of the form may be accomplished without any deformation of the impression. The cured form then becomes the desired inlay generally indicated by numeral 9 in FIGURES 2 and 3.

As seen best in FIGURE 2, the resultant inlay has a flat side edge or wall 10 upstanding and rising on each side of the inlay above the intermediate portion as indicated at 11, thereby providing a hollow heel seat 12 and a generally foot fitting contour, there being a metatarsal elevation 13 provided in the molding process if so desired. The upstanding side edge 10 terminates in the region of the metatarsal arch leaving a substantially flat forward edge 14 on the inlay. As indicated at 15 in FIGURE 3, the inlay may be covered with a piece of smooth leather or other equivalent material to provide a better appearance and a smooth top surface, but this is not essential.

Of course, the inlay may be made by placing only a single portion of molding composition in the pan 1, and omitting the arch supporting spring 5, in the event only a resilient properly shaped insole is desired.

In FIGURES 4 and 5 I have illustrated an inlay or insert of somewhat different shape. In this instance the completed insert generally indicated by numeral 16 may be made in the manner above described for the previous embodiment. However, in this instance the entire bottom of the inlay is flat as shown at 18, and around the portion of the inlay from approximately the metatarsal arch of the foot rearwardly is an upstanding fit outwardly inclined side edge or wall 19 which, as indicated at 20, rises above the adjacent inner part of the inlay to better receive the foot therein. A metatarsal elevation 21 may be provided, and the extra height of the side edge 19 preferably terminates on opposite sides of the forward part of the metatarsal elevation, leaving the anterior portion of the inlay beyond the elevation preferably flat as indicated at 22. If so desired, an arch supporting spring 23 may be embedded within the formed composition as above explained.

It will be noted that the instant invention is so economical that it can well be used for manufacturing standard sizes and shapes of inlays and inserts, to be sold at any time for use in articles of footwear at any time. The economy of the invention, however, permits the custom fitting of an orthopedic shoe or the like at a price substantially lower than was heretofore possible. In such custom fitting of a shoe, the inlay is made in the same manner as above described, but instead of the die 8 being utilized the foot of the particular patient is used to make the impression in the composition by the patient merely standing with his foot in the mold pan and pressing his weight upon the composition. The upper face of the inlay will then have a contour in conformity with the particular condition necessitating custom fitting of the foot.

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In other instances, an inlay of the type shown in FIGURES 4 and 5 may be completed and placed within a shoe. At the time the shoe is purchased the inlay may be removed, covered with a foil or the like, impression compound placed thereon and the patient may step into that compound and shape it to his particular foot, after which the inlay and the shape compound thereon may be placed back in the shoe. The inlay may be ground away or carved at various locations to better fit a foot if it is deemed necessary to do so.

From the foregoing, it is apparent that I have provided an insert or inlay for an article of footwear which may be manufactured to fit standard articles of footwear and made in standard sizes and shapes, or almost as readily be individually custom molded to fit a particular foot requiring orthopedic attention. The inlay is resilient, comfortable to the foot, conforms to the foot, is economical, highly durable, exceedingly light in weight, and may be provided with additional reinforcing and arch supporting means embedded therein if desired.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

In an inlay for an article of footwear, a resilient composition molded into a form having an upper surface in keeping with the plantar surface of a foot,

said composition comprising

a synthetic resin,

a plasticizer, and

cork particles in an amount of from 10 to

50% by weight of the resin present, and

a spring member embedded in said composition in position to support an arch of the foot.

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