

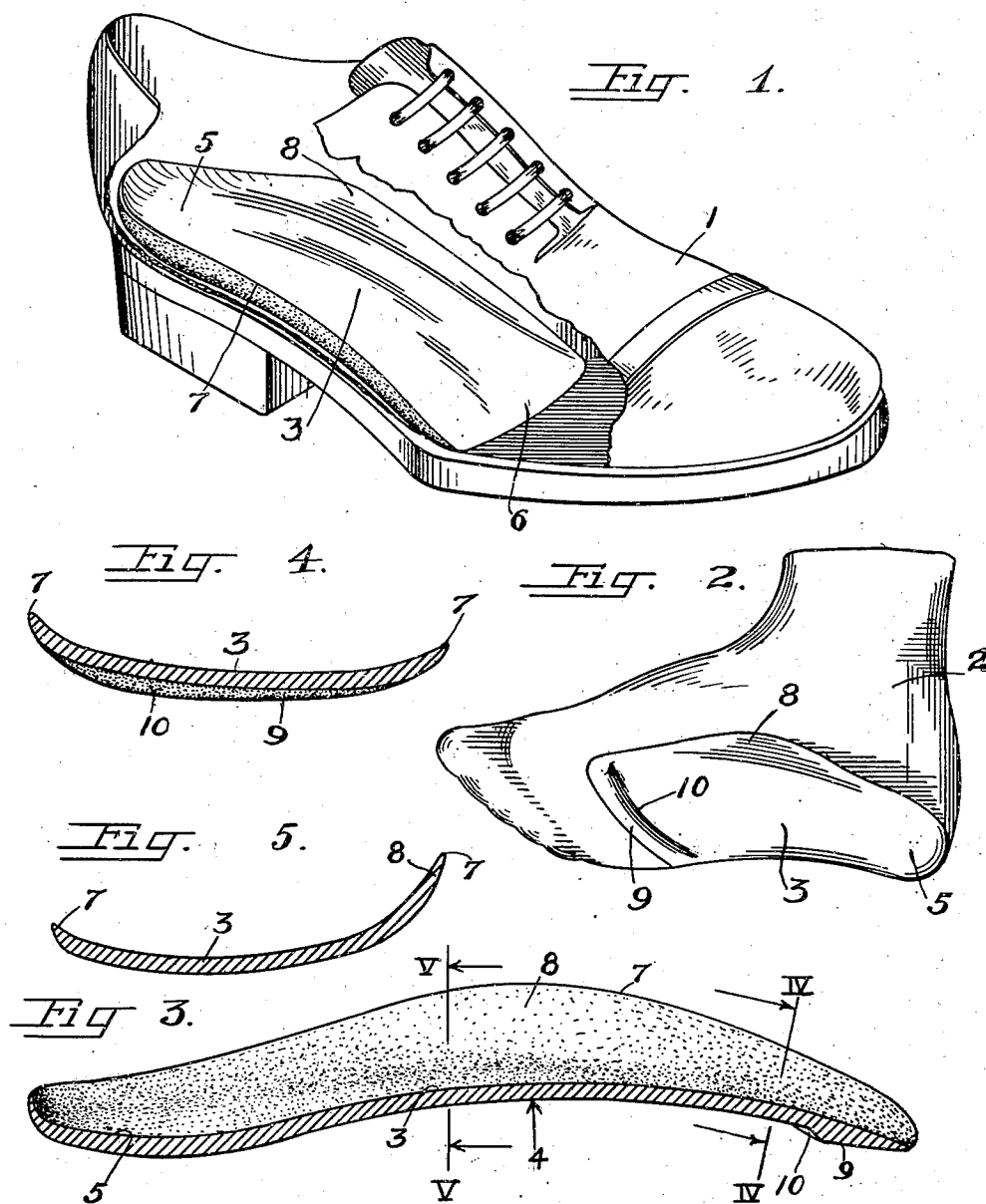
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ARCH SUPPORT

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ARCH SUPPORT

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1 Claim. (Cl. 36—71)

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This invention relates to improvements in arch supports, and more particularly to arch supports of the character placed beneath the plantar surface of the human foot inside an article of footwear, the invention being highly desirable for use in the restoration of an afflicted foot to a normal condition, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

In the past, arch supports have frequently been made of metal and leather parts, sometimes with rubber, felt, sponge rubber or equivalent inserts. Some of these supports were objectionably difficult to manufacture, objectionably heavy in use, and thicker than desired for insertion in a shoe. It is desirable to have an arch support, preferably of only a single piece of material for economy in construction, and material that will not deteriorate from moisture from the foot as is the case with leather, felt, fabric, and some rubber compositions. Under certain conditions, metal may be scarce and it is necessary to utilize other material. Frequently the supports heretofore known were not as simple in construction as is desired, and also frequently the support did not properly seat the foot owing to the difficulty of providing the required configuration.

With the foregoing in mind, it is an important object of the instant invention to provide an arch support marginally shaped entirely around to give added strength, thus making it possible for the body portion of the support to be of lighter and thinner material than normally required.

Another object of the invention is the provision of an arch support having an upturned margin around all but the anterior end of the support, and a transverse reinforcing structure on the underside of the anterior end of the support, thus providing an exceedingly strong support consistent with relative thinness of material, with the resulting support forming a socket for the intimate reception of the foot.

A further object of the invention resides in the provision of an arch support having a wedge-shaped lift across the underside of the anterior end of the support to form a more substantial base for the support and give a better contact with the insole of a shoe, in addition to lending added support to the metatarsal arch of the foot.

Still another object of the invention resides in the provision of an injection molded plastic arch support.

Also a feature of the invention is the provision of a molded plastic arch support with an inte-

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gral marginal strengthening formation entirely around the support.

Still a further feature of the invention resides in the provision of an arch support extremely light in weight with requisite resiliency and of more than ample strength.

Still another object of the invention is the provision of a single-piece plastic arch support shaped to better fit a shoe and shaped to provide integral reinforcing characteristics to permit the use of a relatively thin material especially in the body portion of the support without sacrifice of strength and durability.

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

Figure 1 is a perspective view of a shoe, with parts broken away, showing the shoe equipped with an arch support embodying principles of the instant invention;

Figure 2 is a bottom perspective view of an arch support embodying principles of the instant invention showing the same in operative position against the plantar surface of a human foot;

Figure 3 is a longitudinal vertical sectional view of the arch support itself;

Figure 4 is a transverse vertical sectional view taken substantially as indicated by the line IV—IV of Figure 3; and

Figure 5 is a transverse vertical sectional view taken substantially as indicated by the line V—V of Figure 3.

As shown on the drawing:

The illustrated embodiment of this invention is an arch support for disposition beneath a plantar surface of a right foot, and it will be appreciated that an arch support for a left foot will be of substantially reverse contour from side to side.

The illustrated arch support is preferably entirely of one-piece construction and is preferably injection molded from a suitable plastic. I am not aware that heretofore an arch support has been made by injection molding, although arch supports have been made of plastic material by other processes, including laminated plastic shaped by pressure mold. Injection molding provides an arch support which is of uniform density throughout and finer in both appearance and quality than is an arch support made of plastic in other manners. An injection molded arch support, if a thermosetting plastic is used, is not

subject to a change in shape by virtue of the heat from the foot of the user but is permanently set in its desired contour and yet inherently possesses a requisite resiliency to avoid discomfort to the wearer.

In Figure 1 I have illustrated the arch support in operative position within a shoe 1, and in Figure 2 I have illustrated the arch support in proper position against the plantar surface of a human foot 2.

With reference more particularly to Figures 1 and 2 it will be seen that the arch support is in the nature of a single-piece plate comprising a body portion 3 so shaped that its upper face has a contour complementary to the plantar surface of a correctly shaped human foot. The body portion is upwardly bowed as indicated at 4 in Figure 3 in order to lend support to both the inner and outer longitudinal arches of the foot. At the posterior end, the support is shaped to provide a curvate recess or heel seat as indicated at 5. Accordingly, when the support rests upon a flat surface, the only contact with that surface is at the underside of the heel seat 5 and the anterior end 6 of the support.

Reinforcing means are provided around the support to make it possible for the body portion 3 to be relatively light and thin without sacrifice of strength and durability. As to all but the anterior edge 6 of the support, this marginal reinforcing consists of an upwardly rolled marginal portion 7 which varies in height in keeping with the contour of a normal foot. For example, the turned marginal portion is highest as indicated at 8 in the region of the intermediate portion of the inner longitudinal arch, at which point a normal foot is spaced highest from the ground. Likewise, the upwardly turned marginal portion is deeper around the heel seat than along the outer side of the arch support. Thus, the entire arch support in effect provides a form-fitting socket for reception of the foot.

The upwardly turned marginal portion 7 may be relatively thin, and yet it provides considerably added strength to the arch support as a whole, and the entire support may be made of thinner material than would otherwise be the case. The upwardly turned marginal portion discontinues at each end of the anterior edge of the arch support which end is turned slightly downwardly in its upper face so as to be most comfortable to the foot.

An important feature of the instant invention resides in the strengthening of the anterior end 6 of the arch support and at the same time provide means for better seating of the arch support within a shoe or other article of footwear. With reference to Figures 2, 3 and 4 it will be seen that a wedge shaped lift or reinforcement 9 is provided across the anterior end of the arch support. This wedge shaped portion has the narrower part thereof disposed forwardly at the leading edge of the support, and the thicker portion disposed rearwardly. This thicker portion preferably merges with the body of the support in a smooth taper without sharp edges as indicated at 10. The additional strength provided by the upturned marginal portion 7 at the two sides and rear end of the support, is provided at the anterior end of the support by this reinforcement 9. Thus, the support is reinforced or given additional strength completely therearound.

In addition to its strengthening function, the lift or reinforcement 9 accomplishes several other purposes. For example, the arch support will

terminate usually adjacent the metatarsal heads of the foot, and in a properly fitting shoe this will occur at the point where the insole and outer sole begin to rise upwardly to the top of the heel of the shoe. The arch support, being upwardly bowed, rises sharply from its forward end, and consequently the wedge shaped reinforcement 9 affords better seating for the forward end of the arch support within a shoe and tends to fill the gap that would otherwise occur near the forward end of the support. In addition, the reinforcement 9 lends additional support to the metatarsal arch of the foot. It will be seen in Figure 2 that the forward end of the arch support is cut off obliquely in keeping with the disposition of the metatarsal heads so that the inner anterior corner of the support will be adjacent the first metatarsal head and the outer anterior corner adjacent the fifth metatarsal head.

Where an arch support is made of metal, or the plate portion of an arch support is made of metal, it is necessary in nearly all cases to provide an additional piece of leather, felt, or some other fabric material, to prevent the forward edge of the arch support from gouging into the insole of the shoe. It is also frequently desirable, if not necessary, to cover the entire upper face of the support with a piece of leather or fabric for contact of the foot. The instant arch support eliminates these additional pieces of material and consequently eliminates the laborious and expensive operations of securing those additional pieces to a metallic plate. There is no need with the instant support for any extra material or other means to prevent gouging of the forward edge of the support into the insole of the shoe. In the first place, the support being made of plastic, the gouging action will be less forceful than though the plate were made of metal. However, with the wedge shaped reinforcement 9, there will be no tendency of the support to gouge into the insole because, as pressure is placed upon the arch support, more and more of the wedge shaped reinforcement will come in contact with the insole of the shoe and the anterior edge of the arch support will thus be cammed forwardly and slightly upwardly so that it will pass smoothly over the insole.

In connection with the instant invention, it will be appreciated that, if so desired, the wedge shaped reinforcement 9 may be made separately from the remainder of the arch support and attached by cement or in an equivalent manner, but the preferred form of the invention is to have the wedge shaped lift molded integrally with the remainder of the support, especially if the support is made of plastic material.

From the foregoing, it is apparent that I have provided an arch support which may be made by the injection molding process of a suitable plastic material, and which is reinforced entirely therearound so that the body of the support may be of thinner and lighter material than otherwise would be the case. In actual use, supports of this character having more than sufficient strength and durability and possessing all of the requisite resiliency for comfortable use, may be made of a suitable plastic material so that one individual arch support will weigh only between 1 and 2 ounces. It will further be noted that the support is shaped to provide a form-fitting socket for the foot, seat snugly without gouging in a shoe, give added support to the metatarsal arch of the foot, and may be extremely economically manufactured.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claim.

I claim as my invention:

An arch support comprising a relatively rigid member of hard plastic material shaped to support the inner and outer longitudinal arches of a human foot and to define a heel seat portion, an integral upstanding margin on said member extending around all but the anterior edge thereof, said anterior edge being directed by the bottom of said heel seat portion into end edge con-

tact with the insole of an article of footwear adapted to receive the member, and a transverse reinforcement on the underside of the anterior margin of the member increasing in thickness rearwardly from said anterior edge and terminating adjacent the portion where said insole rises rapidly to the heel of said article of footwear for tending to fill the gap that would otherwise occur at the forward end of the member, said member when pressured sufficiently by the human foot being deflected to contact more of the reinforcement with the insole for camming said anterior edge forwardly and upwardly to pass smoothly over the insole.

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