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R. P. O'DONNELL

ARCH SUPPORT

Filed July 7, 1922

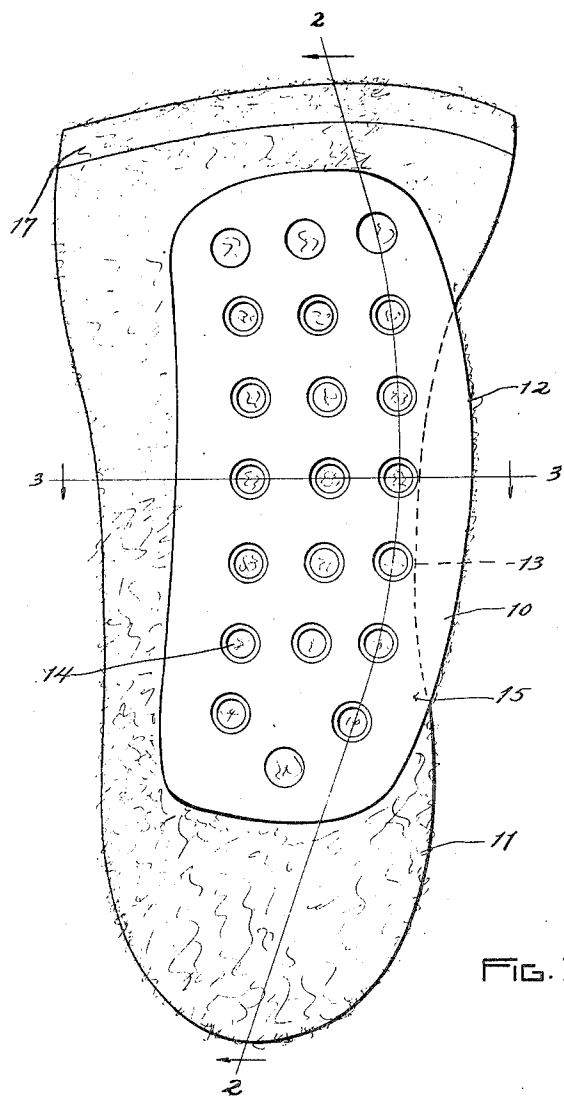


FIG. 1

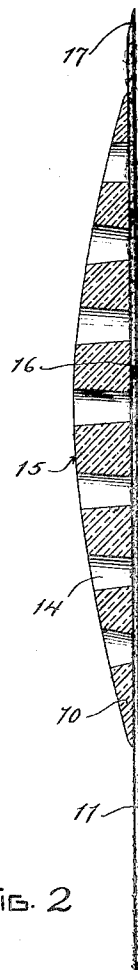


FIG. 2

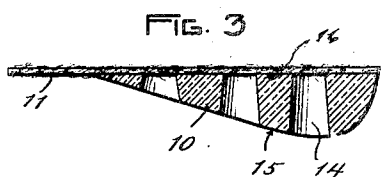


FIG. 3

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## UNITED STATES PATENT OFFICE.

RICHARD P. O'DONNELL, OF CHICAGO, ILLINOIS.

## ARCH SUPPORT.

Application filed July 7, 1922. Serial No. 573,253.

*To all whom it may concern:*

Be it known that I, RICHARD P. O'DONNELL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Arch Support, of which the following is a specification.

This invention relates to arch supports and has for its principal object the provision of a non-rigid resilient support of extremely light weight construction and very compact to take up the smallest possible space in the shoe consistent with proper supporting of the arch under all conditions. The support of the present invention in the respects mentioned departs considerably from present commercial forms of supports which commonly employ metal plates secured to leather or fibre backings which, of course, are relatively rigid, inflexible and non-conformable to the foot besides being of sufficient weight to be quite noticeable in wearing. Moreover, these prior forms of supports commonly have been of such proportions that the shoe would not fit the foot properly when the support was in place.

Present commercial forms of supports are further objectionable, due to their being relatively non-yielding and bulky, in that they chafe the foot and cause a crowding thereof in the shoe and thereby cause copious perspiration with its attendant discomforts. In the present invention these conditions are remedied by the provision of a relatively non-rigid resilient support employing a perforated molded sponge rubber pad having an imperforate backing of felt or other material having similar properties which, besides being comfortable for the wearer, serves to hold the support in proper position in the shoe and permit free circulation of air under and about the foot.

A further object is to provide a support of exceedingly simple construction and of a practical and durable character which can be manufactured at a nominal cost.

The invention embraces other objects and advantages to be brought out in the following specification. In the specification reference is made to the drawing wherein Figure 1 is an underside elevational view of the arch support, Fig. 2 is a longitudinal section taken on the line 2—2 of Fig. 1, and Fig. 3 is a transverse section taken on the line 3—3 of Fig. 1, both sections being taken looking in the direction indicated by the small arrows.

The support comprises a pad or cushion portion 10 and a backing 11. The pad is preferably made of sponge rubber or gutta percha or any suitable rubber or other composition having similar properties and is preferably molded of varying thickness as shown in Figs. 2 and 3, diminishing gradually from a portion of greatest thickness at the portion adapted to lie beneath the inner longitudinal arch of the wearer to a feather edge in front of the heel and in back of the ball of the foot and at the portion adapted to lie beneath the outer longitudinal arch of the wearer, it being the object to provide support for the arch at the point where it will be most beneficial, namely, at the inner longitudinal arch. The pads will in practice be provided in different sizes having proper consideration to proportions so that, as respects all sizes, the pad will be of a thickness beneath the arch only sufficient to render proper support but not sufficient to raise the foot itself in the shoe. In this way the foot is not crowded in the shoe and the objectionable features noted above are avoided.

The backing 11 is cemented or glued to the pad and is usually provided of a size larger than will ordinarily be necessary so that the dealer selling the support may trim the backing to the proper size to suit the needs of the customer. The necessity for carrying a large stock of odd sizes is in this way obviated as a variety of sizes may be produced with each support. The backing is cut to the general contour of the inside of the shoe as shown in Fig. 1, but preferably is of extended width across the insole portion beneath the inner longitudinal arch of the wearer as indicated at 12, the normal contour of the shoe being approximately that indicated by the dotted line 13. When the support is placed in the shoe, assuming, of course, that it has been trimmed to size, it will fit snugly therein over the insole portion thereof, but being oversize at the insole will tend to crowd. The portion 12 of the support will thereby be projected upwardly against the inner longitudinal arch of the wearer, thus rendering the best possible support for the arch.

The backing 11 is preferably of felt made of a special high grade wool the properties of which have been found to be particularly suited to this purpose. The most noticeable property of this material which makes it

preferable over most other materials of the same weight and character is that it will conform to the general shape of the bottom of the foot, while at the same time it does not tend to curl up or wrinkle. Furthermore, it has the proper degree of flexibility, at least sectionally or locally, so that it will give readily and will hardly be noticeable in wearing. On the other hand, it is relatively rigid lengthwise so that once trimmed to the proper size and fitted in the shoe it is not apt to curl up at the edges and be crowded to one side or the other, which has been found to be frequently the case with certain prior forms of supports. The chief function of the backing is therefore manifest; it serves to hold the pad in the proper position to render support for the arch. Aside from this, the backing serves as an intermediate lining so that the foot is not in direct contact with the rubber or other material of which the pad is formed. It also avoids all irregularities and renders the support comfortable to wear. A further advantageous property of the felt over most other materials is its great durability and the fact that it will not fray or present raw edges when trimmed to size.

The pad 10 is molded with perforations or holes 14 arranged conveniently in parallel series. These perforations are frusto-conical in form, being larger at the lower end 15 which lies against the insole of the shoe than at the end 16 presented to the backing 11. The particular form of the perforations renders them easy to produce in the molding operation for obvious reasons and furthermore tends toward lightness and greater resiliency of the pad. The perforations being smaller at the end presented to the backing, there is left a maximum surface area for the application of cement or glue whereby to secure the pad to the backing so that it will not be apt to become loose after continuous use. The principal function of the perforations, as will presently appear, is to permit and induce a circulation of air under and about the foot. Other important advantages, however, arise from the provision of these holes. They serve in a large measure to prevent the movement of the support about in the shoe especially in the action of walking, running and jumping, since the lower face of the pad is in the nature of a non-skid surface by virtue of the perforations.

In certain prior forms of supports employing backings of such materials as leather, fibre and the like which, of course, do not permit circulation of air therethrough, it has been common to provide openings registering with the openings in the pad used in conjunction therewith. The chief objection to such a provision, aside from the fact that such holes collect lint

and dirt, is that they are a source of considerable annoyance to the wearer because of the very great sensitiveness of the bottom of the foot which has been found to detect the presence of even very small holes of this kind. With the arrangement herein disclosed wherein the backing is relatively porous, it is feasible to employ a plain imperforate piece of material overlying the holes and presenting a regular and smooth surface pleasant to the feel while nevertheless a free circulation of air therethrough is permitted under and about the foot. This feature is particularly desirable since it permits the carrying away of the poisonous excretions from the pores of the bottom of the foot. In the prior forms of supports which employed leather such excretions could not be absorbed by the backing of the support as they may be in the use of the support of the present invention nor was sufficient ventilation afforded to evaporate them. As a consequence considerable discomfort was given the wearer because the feet in such condition are usually quite irritable. Frequently, also, bunions, callouses and the like have been found to result from wearing such supports.

The comfort derived through the use of the support of the present invention is partly attributable to the fact that in use it gives a rolling motion to the foot. Such a motion is impossible where the support has a tendency to move with respect to the foot. In the present device, however, the felt which has abundant nap clings very readily to the sock so that when once positioned in the shoe the support will cause the foot to ride upon the pad and the wearer will derive the full benefit of the support. The backing, particularly when subjected to the warmth and moisture from the pores of the foot, being of felt tends to conform more or less to the shape of the foot and thus becomes more comfortable to wear. The backing is preferably trimmed bevelled at the forward edge on its under side as shown at 17 so that when the support is in place in the shoe the bevelled end will lie down nicely across the sole of the shoe and, especially after the support has been in use for some time so that the backing has become properly conformed to the shoe and the foot of the wearer, it will not be apt to turn up when the shoe is removed from the foot. Furthermore, no projecting edge is presented which might otherwise cause chafing of the sole of the foot. The pad compares favorably with the other types of supports employing metal or other substances having similar properties, since it tends to assume its undistorted shape after each step and does not after a time become set in a distorted shape which would otherwise greatly impair its utility. The properties of

the felt backing, which have already been enumerated, together with the fact that it has fair absorbent properties and is relatively porous so that a free circulation of air about the foot is maintained, make this support highly desirable. A further advantage is that as compared with prior forms of supports the support of the present invention is far more durable and will stand up under continued use and can be produced at a nominal cost.

I claim as my invention:

1. An arch support comprising a pad portion of resilient pliable material having a plurality of perforations passing vertically therethrough, said pad portion being arranged to overlies the insole of the shoe beneath the inner longitudinal arch of the wearer, and a backing sheet of felt to the underside of which said pad portion is secured, said felt sheet being formed with a contour to fit within a shoe and thereby position the pad portion properly.

2. An arch support comprising a pad portion of non-rigid, resilient and pliable material having its greatest thickness at the

side edge of the pad which lies at the inner side of the wearer's foot, the thickness diminishing gradually toward the opposite edge of the pad and also toward the front and rear ends of the pad, the pad having a plurality of perforations passing vertically therethrough, and a backing sheet of pliable, porous and absorbent material to the underside of which said pad is secured, said backing sheet being cut to the general contour of the inner sole of a shoe and arranged to fit in the shoe above the insole and to position said pad with the thickest portion thereof beneath the inner longitudinal arch of the wearer, said backing and said pad being of extended or abnormal width at the middle of the support in proportion to the normal contour of a shoe sole whereby the crowding of the support down into the shoe when worn causes the thickest portion of the support to be flexed upwardly against the inner longitudinal arch of the wearer.

In testimony whereof, I have hereunto affixed my signature.

RICHARD P. O'DONNELL.