Jan. 24, 1933. G. D. HORNING 1,895,327

ARCH SUPPORT

Filed Aug. 26, 1927

Fig. 1.

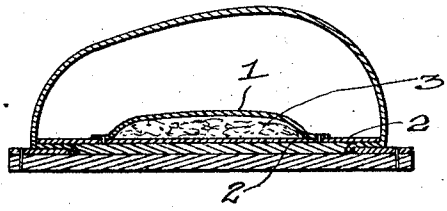


Fig. 4.

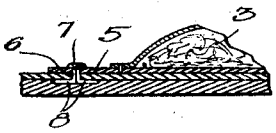


Fig. 2.

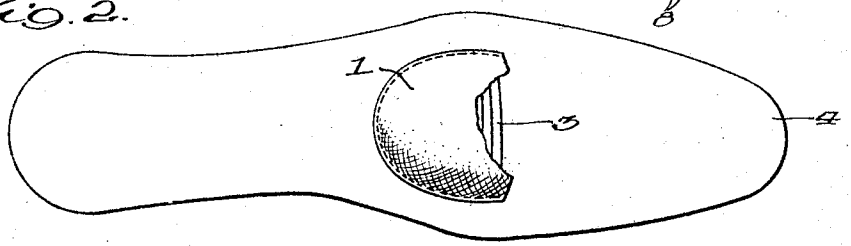


Fig. 3.

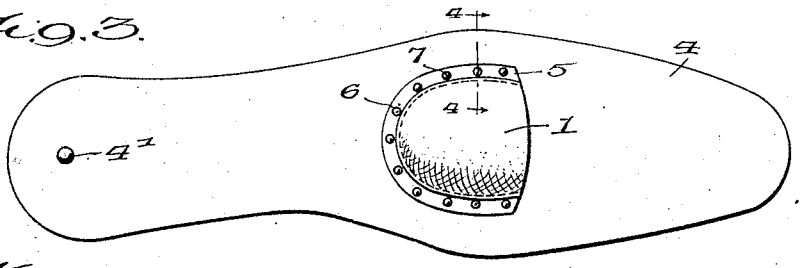


Fig. 5.

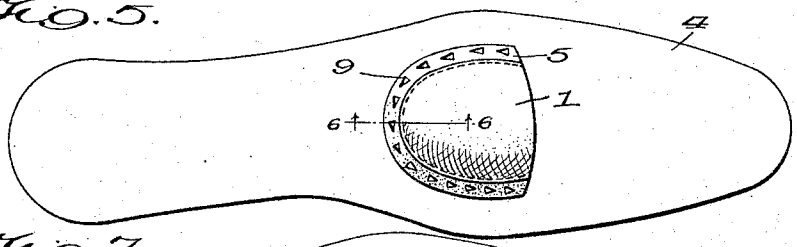


Fig. 7.

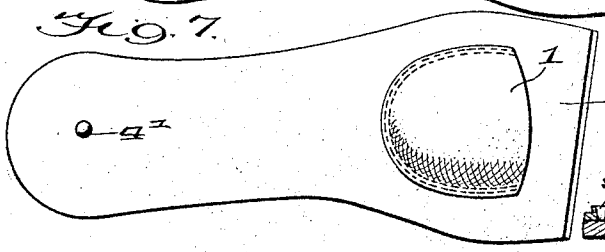


Fig. 6.

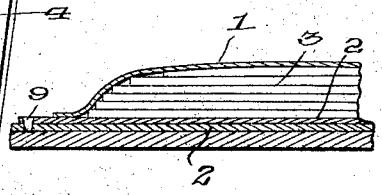
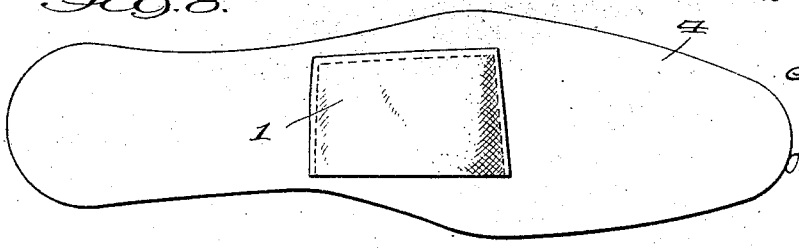


Fig. 8.



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UNITED STATES PATENT OFFICE

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ARCH SUPPORT

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This invention relates to arch supports.

The purpose of the invention is to provide means for the prevention, relief or correction of mechanical defects in the front, anterior, or metatarsal arch of the human foot.

Heretofore a large number of devices for the purpose have been proposed, but they are objectionable because of excessive cost, because of not being readily adaptable for use under different and changing positions and conditions of the defects to be treated or relieved, because of the impossibility of permanently retaining them in required positions, and for numerous other reasons. For instance, the entire sole of a shoe has in many instances been constructed with a view to furnishing a support or supports for defective parts of the foot. When this is done a very considerable expense is involved, and of course each sole so made is formed to give relief to only the foot for which it is designed. Further, even if the main portion of the support or supports are of rigid material and are, at the outset properly positioned, constant pressure in use will cause a yielding of the leather or the like by which the support is held, and the result is that the support loses its usefulness because of having its height lessened or its shape or position changed.

In the use of short supports composed of a separate body, wholly or partly of metal and shaped to fit the metatarsal arch of a user only, experience has shown that as they or the shoes in which they are placed, become worn or depressed, they lose their effectiveness and are liable to annoying displacement.

In some supports an inner sole of leather or other flexible material covering the whole or a part of the outer sole of the shoe, has been provided on its lower face with a protuberance, with the intention of having this protuberance, by indenting the inner sole or otherwise effecting its shape or height in parts to form on the upper face of the inner sole a supporting projection. This form of support fails of its purpose because, obviously, the upper face of the inner sole can not by this means be given the definite, clear cut shape which is required. In other supports, rigid plates or bodies of metal and of different shapes have been detachably secured to the inner face of the sole of a shoe. In this supporting means clearly, a very large number of the metallic plates or bodies, varying widely in height and shape must necessarily be on hand in order even approximately to be able to fit all the parts of feet presented for relief or treatment.

Many other ideas are involved in devices which have heretofore been produced for relief or cure of general or specific defects of the foot, of the character hereinbefore referred to, but none of them, so far as I am aware, are free from objections as serious as those recited in regard to forms which have been specifically mentioned.

The support which I have devised is of a form which insures against displacement when attached in position for use; affords means whereby the portion of a foot to be supported or relieved may accurately be fitted by a supporting protuberance; and whereby the original shape of the protuberance changed by wear or otherwise may readily be restored, or whereby the size, shape or location of the protuberance may be changed to correspond to changes taking place in the form of a foot subjected to treatment by the protuberance. Inasmuch as the support may be changed in form and location by a user, no cost is involved. It consists generally, of a sustaining base, which may be an inner sole, preferably removable and of a size to fit accurately to, or to be secured in, a shoe to which it is applied, and a support of a form to permit of changing its height and form, arranged on the upper face of the support. Further it consists of a support capable of having its position changed at will when necessary or desirable. In addition, the invention consists of various generically and specifically novel features of construction and arrangement of the employed parts, substantially as hereinafter described and claimed.

One form of embodiment of the invention is illustrated in the accompanying drawing, in which—

Figure 1 is a vertical section of a shoe with a support arranged for use in the shoe.

Figure 2 is a plan view of one form of sup-

port attached to a base or holding means, the upper portion thereof being broken away to show the filling of the support.

Figure 3 is a plan view of a support of a construction, and provided with such adjuncts as to permit the ready attachment to, and detachment of the support from its base.

Figure 4 is a vertical sectional view of the support, etc., shown in Figure 3.

Figure 5 is a plan view of a support of a somewhat modified construction, and having integral attaching means for securing it to a base.

Figure 6 is a vertical sectional view of the support shown in Figure 5.

Figure 7 is a plan view of a modified form of inner sole or base, adapted for the attachment thereto of a supporting projection.

Figure 8 is a plan view of modified form of support.

The support which is intended to contact with the sole of the foot of a user is preferably in the general form of a pocket or receptacle to receive material by which the size and shape of the support may be determined or changed at will. The upper face 1 of the pocket or receptacle which in use comes into contact with the foot of the user may be of any suitable material, such as thin leather, fabric, fibre or metal, and it is essential that it be flexible or yielding, enabling it to be readily raised, lowered or so shaped by the introduction or removal of a filling into or out of the pocket to impart the required shape and height to the pocket or receptacle. The upper face 1 of the pocket or receptacle is secured by sewing or otherwise to the upper exposed surface of a base 2, which may be, as herein shown, an inner sole. In this form the base forms the inner wall of the pocket or receptacle.

The required height and shape of the upper exposed face of the pocket or receptacle are imparted by introducing into it a filling 3 of any material suitable for the purpose. The preferred filling consists of strips or layers of material which is of a nature to retain its shape when subjected to the weight imposed by the foot of a user. In practice one or more strips or layers of leather, rubber, felt, cloth, metal, fibre or the like, of lengths and shapes suitable for giving the required height and shape to the upper face 1 of the pocket or receptacle, have proved satisfactory.

The support consisting of the upper face of the pocket or receptacle and the filling is attached to a suitable base or holding means, and herein I have shown an inner sole 2 for receiving and retaining the support. The inner sole which may be of leather, felt, fibre or other suitable material, is preferably of a size and shape to entirely cover and fit accurately to the sole of the shoe in which it is used, in order that when the support is attached the position of the latter may be securely maintained. If necessary or desirable, the inner sole may be nailed, cemented or otherwise permanently secured to the inner face of the outer sole of the shoe, as by a tack 4'.

Instead of making the base or inner sole of a size to cover the entire sole of the shoe, it may be of a length to extend only from the heel of the shoe to a point beneath the ball of the foot of a user, as shown in Figure 7.

The construction of the pocket or receptacle may be such as to permit of its being either permanently or detachably secured to its base. In the form shown in Figures 3, 4, 5 and 6 of the drawing the bottom of the pocket or receptacle is formed by a piece of material 5 to which the covering portion 1 is attached, and the bottom 5 projects beyond such covering portion forming a flange. In securing a support of this form to a base 2, such as an inner sole, any suitable attaching means by which the support may be either permanently or detachably secured may be employed.

In the attaching means shown in Figure 3, the flange of the bottom portion 5 of the support may be of leather, fabric, or some more rigid material, and is provided with a series of openings 6 extending through it. In securing in place a support having a bottom portion of this form, staples or similar fasteners 7 are introduced through the openings 6 in the flange and through the base to which the support is attached, and the ends 8 of the staples are bent to lie along the lower face of the base and thus to secure the support in place. This form of attaching means allows of the easy detachment of the support from its base, for the purpose of changing its position, if desired. Another form of support and attaching means which allows of rapid attachment and detachment of the support, to and from its base, is shown in Figures 5 and 6 of the drawing. In this form the bottom portion 5 of the pocket or receptacle is composed of metal, preferably thin and flexible and of a non-corrosive character. The flange portion of the metal bottom has stamped or otherwise cut in it a series of tongues 9, preferably of taper form, which may be turned at a right angle to the flange passed through the base 2, and then bent to lie along the under face of the base.

For general purposes where the location of the defect to be treated may accurately be determined, the pocket or receptacle may be formed of a single piece of material, and be attached to the base by sewing, as shown in Figure 2 of the drawing. If sewing is employed, the thread used is preferably disposed as shown, thus allowing it to be easily pulled out or cut, to facilitate ready detachment of the pocket or receptacle.

One side of the pocket or receptacle is preferably left open to permit of the ready

introduction or removal of the filling. This opening may be in the front or rear of the pocket or receptacle, or at the side thereof, as shown in Figure 8 of the drawing.

From the foregoing it will be clear that the pocket or receptacle may be secured either permanently to its base, when the portion of the foot when the defect or ailment to be treated is determined, or detachably, when experimenting as to the location of the trouble is necessary or desirable. Further, by reason of the ease with which the height and shape of the support formed by the pocket or receptacle may be changed by adding to, taking from, or changing the shape of the filling of the pocket or receptacle, it will be obvious that the support or relief of any affected part of a foot may be provided for.

In the production of the described support two objects of importance are attained. The article is very cheap in cost, so that a new one may be substituted for one becoming worn at trifling expense, and, inasmuch as a user may readily adapt the height and shape of the support to his foot by removing, introducing or changing the form of the filling of the pocket or receptacle, the expense of expert service is entirely dispensed with.

I claim:

1. A support of the kind described, comprising a base, a pocket, means for detachably securing the pocket to the upper surface of the base, and an insertable and removable filling for the pocket.

2. A support of the kind described, comprising a base, a pocket, means for detachably securing the pocket to the upper face of the base, and a filling for the pocket consisting of insertable and removable strips of material capable of retaining their shape under pressure arranged in the pocket.

In testimony whereof I affix my signature.

GEORGE D. HORNING.