Feb. 9, 1937. LE ROY V. HILES 2,070,404

METATARSAL ARCH SUPPORT

Filed June 17, 1936

Fig. 1.

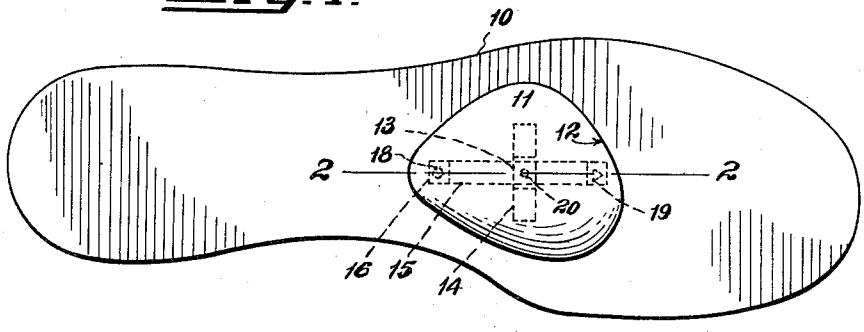


Fig. 2.

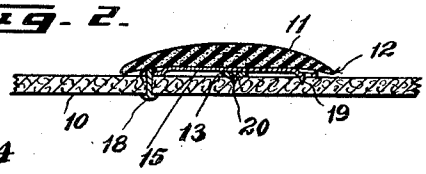


Fig. 3.

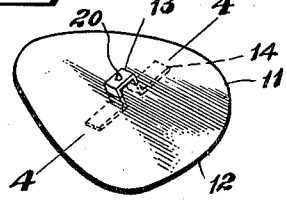
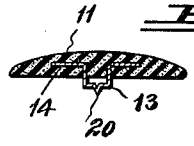


Fig. 4.



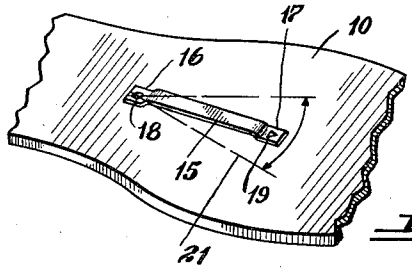


Fig. 5.

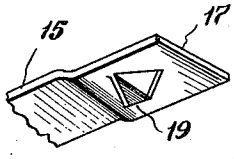


Fig. 6.

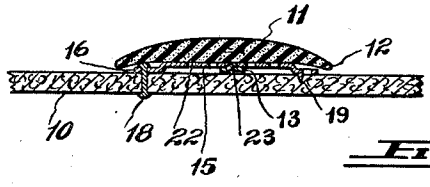


Fig. 7

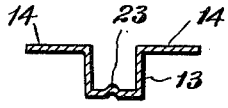


Fig. 8.

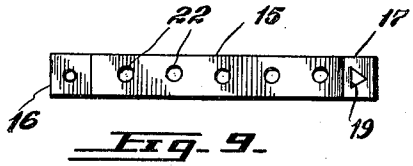


Fig. 9.

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METATARSAL ARCH SUPPORT

Le Roy Vivien Hiles, London, Ontario, Canada

Application June 17, 1936, Serial No. 85,655

7 Claims. (Cl. 36—71)

The primary object of the invention is to provide a serviceable and inexpensive metatarsal arch support incorporating mechanism whereby it may be readily adjusted to suit the metatarsal arch of an individual.

A further object of the invention is to produce a device of this nature that can be built into a shoe as a unit therewith, or can be applied to a shoe as an accessory or attachment.

It is recognized that the metatarsal arches of feet that are of the same over-all length may vary in lengthwise position: consequently, for a given size of shoe, it is necessary to provide a range of longitudinal adjustments for the pad sufficient to accommodate the location of the metatarsal arch. Also, there may exist a slight variation in the transverse curve of the metatarsal bones, which in some cases requires a certain lateral adjustment of the arch support to properly conform to the position of these bones.

A distinctive feature of the invention is that it is so constructed as to be adjustable both longitudinally and transversely of a shoe. A further feature is that the pad may be easily changed to suit a narrow or broad foot.

The invention consists essentially of a flat elongated bar pinned at an end either directly to the sole of a shoe or a separate sole insertable in the shoe. The bar may be shifted about its pinned end, and the other end carries a prong or the like by which it may be retained in a set position. The pad is supplied with a plate looped under the bar and slidable therealong. The plate has a tit by which it is secured in a predetermined position.

In the accompanying drawing Figure 1 is a plan view depicting the invention applied to a sole.

Figure 2 is a lengthwise sectional view taken on line 2—2 of Figure 1.

Figure 3 is a perspective view of the underside of the pad.

Figure 4 is a transverse sectional view of the pad taken on line 4—4 of Figure 3.

Figure 5 is a fragmentary perspective view of a sole depicting the bar attached to it.

Figure 6 is a perspective view of the prong end of the bar.

Figure 7 is a sectional view similar to Figure 2, but showing a slightly modified form of the invention.

Figure 8 is a sectional detail of the plate thereof that is carried by the pad, and Figure 9 is a plan view of the bar that is attached to the sole.

Like numerals of reference indicate corresponding parts in each of the figures throughout the drawing of the invention.

In the drawing the reference numeral 10 generally denotes a sole which may be the actual sole of a boot or shoe, or it may be a separate insole. For the sake of convenience the term "sole" will be used hereinafter as denoting either a shoe sole or loose sole insertable in a shoe.

The pad 11 has the usual convex upper surface and a substantially flat bottom face. The forward edge 12 recedes on a curved line to conform to the metatarsal bones. The pad is preferably composed of sponge rubber, however it may be obviously constituted of other material.

A plate 13 depends from the bottom face of the pad and is shown as a U-shaped member having means by which it is affixed to the pad. The means may take the form of wings 14 integral with the upper ends of the U-member and mouldably embedded in the pad. The plate thus provides a loop member of which its opening is receptive to the bar.

The bar, indicated generally by the numeral 15, is a flat elongated member having downwardly offset ends 16 and 17 that space the intermediate extent from the sole on which it rests. This spacing accommodates the thickness of the material of the plate. The bar is arranged lengthwise of the sole and has its rear end 16 permanently fastened to it by a rivet 18 or the like. The front end 17 carries an element 19 for detachably engaging the sole, this may consist of a point or prong struck down from said end so as to press into the sole and thus preclude shifting of the frontal end of the bar.

In use, the pad is attached to the bar by the plate and is free to slide therealong in order that it may be properly positioned to suit the metatarsal arch of an individual. With a view to retaining the pad in its determined location, the plate carries a depending spur or tit 20 that is pressed into the sole. In making adjustment of the pad, the frontal end of the bar is raised slightly to enable the spur or tit to be freely slid with the plate lengthwise of the bar. When the position of the pad has been predetermined, the bar and the plate are pressed down so as to engage the prong and the tit with the sole.

It will be gathered that by this construction the pad may also be capable of angular or transverse adjustment by using the rivet as a pivot so as to angularly shift the bar as indicated by the dash lines 21 in Figure 5.

The modification included in Figures 7, 8 and 9, discloses an alternate manner of securing the pad

against sliding movement on the bar. This consists of providing a longitudinal series of holes in the bar as at 22, and providing a struck-up projection or tit on the plate as at 23 whereby selective engagement of the tit in a hole prevents the pad from moving therealong. It will be appreciated that due to resiliency of the pad, it will press against the upper face of the bar and assist in maintaining engagement of the tit in an aperture of the bar.

Whereas the bar 15 is shown and described as having its rear end 16 permanently fastened to the sole, this bar could be reversed so that its front end is permanently fastened and the rear end detachably secured.

What I claim is:—

1. A metatarsal arch support comprising a pad, a bar for attachment to a sole, and means carried by the pad to enable it to slide along the bar and to be retained in determined locations therealong, said means including a plate having a tit adapted to seat itself in a relatively stationary element.

2. A metatarsal arch support comprising a pad, a plate secured thereto having an opening at the bottom face thereof, a bar for attachment to a sole, said bar being inserted through said opening to slidably carry the pad, and a tit carried by the pad and adapted to seat itself in a relatively stationary element.

3. A metatarsal arch support comprising a pad, a U-shaped plate depending therefrom forming a loop, means securing the plate to the pad, a substantially flat bar inserted through the loop, and a tit projecting from the plate adapted to be seated in a relatively stationary element.

4. A metatarsal arch support comprising a pad of formable material, a U-shaped plate depending therefrom to provide a subjacent loop, said plate having wings moldably embedded in the pad, a substantially flat bar inserted through the loop to provide a slidably interfitting engagement, and a tit adapted to be seated in a relatively stationary element to retain the pad in set position.

5. A metatarsal arch support comprising a pad, a plate secured thereto having an opening at the bottom face thereof, a bar for attachment to a sole, said bar being inserted through said opening to slidably carry the pad, and a point or tit depending from the plate for penetrating the sole to preclude movement of the pad along the bar.

6. A metatarsal arch support comprising a pad, a subjacent bar connected thereto, means for pivotally attaching an end of the bar to a sole so that it may be shifted in the plane thereof, and means providing a detachable connection for the other end of the bar whereby it is capable of angular adjustment.

7. A metatarsal arch support comprising a pad, a subjacent bar, means slidably attaching the pad to the bar, means for retaining the pad in several longitudinal positions on the bar, means for pivotally attaching an end of the bar to a sole so that it may be shifted angularly thereof, and means providing a detachable connection for the other end of the bar whereby it may be retained in angular adjustment.

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