April 7, 1936. D. R. SLATER 2,036,890

ARCH SUPPORT

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Fig. 1.

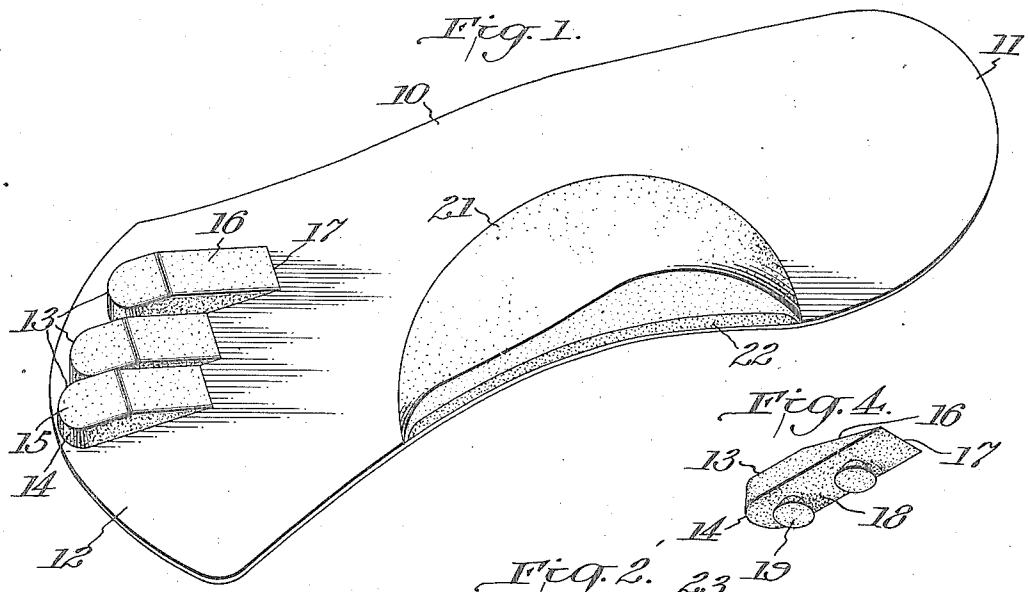


Fig. 4.

Fig. 2.

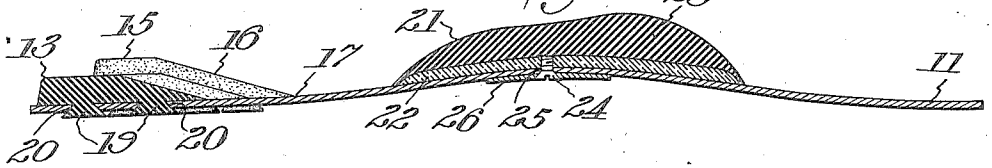
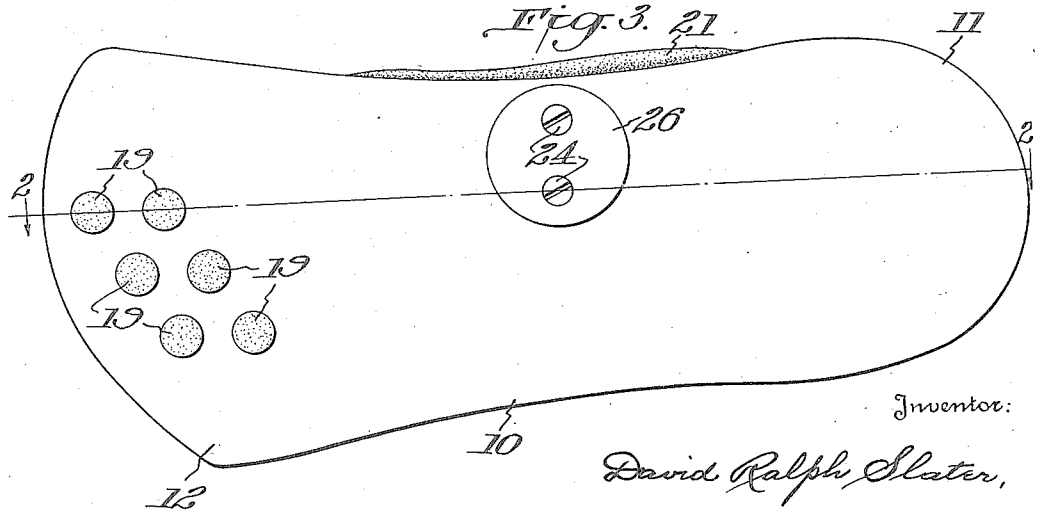


Fig. 3.



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ARCH SUPPORT

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10 Claims. (Cl. 36—71)

The present invention relates to improvements in arch supports.

Heretofore such supports have usually been constructed of leather, either braced with a rigid underlying metal plate or provided with pockets on the under face for the reception of pads. In the latter type, the intended purpose is to permit a building up of the support to meet individual needs. Such structures have failed to accomplish their purpose. Leather supports after being worn for a while invariably curl at the heel or sides, permitting shifting of the support to an improper position. The pocketed pad type of support, which is intended to provide for individual adjustment, possesses no means for meeting unusual foot conditions, such as varying lengths of bones, and at the most provides only for regulating the height to which the arch as a whole is raised. Metatarsal or longitudinal adjustments made below insoles warp down the soles of the shoe instead of raising the bones of the foot as desired.

In addition to providing inefficient and defective support, the use of the known types of arch supports often results in the cutting, breaking down or distortion of the shoe of the wearer.

With these and other defects of the known types of construction in mind, it is an object of this invention to provide a support which will permit precise adjustment for the tarsal or metatarsal structure regardless of the natural type of the individual foot.

Another object is to provide a support which, in the hands of a skilled fitter, in the manner described hereinafter, will result in the production of a support which precisely fits the foot for which it is made, providing correct adjustment of each of the metatarso-phalangeal joints individually, and staying in correct position in the shoe.

A further object is to provide for the ready removal and replacement of the elements of the support from time to time as the adjustment of the bones progresses.

These and other objects and advantages of the invention are attained through the use of my improved support which comprises a comparatively thin and relatively rigid insole member of suitable shape and size to fit within a shoe and provided on its upper surface with individual pads or cushions which are fastened on said insole member in predetermined position and relation to each other, the relative positions having been previously ascertained through the use of special calipers or foot measuring devices which form no part of the present invention.

An embodiment of my invention is illustrated in the accompanying drawing, wherein

Fig. 1 is a perspective view of a complete arch support,

Fig. 2 is a sectional view taken on the line 2—2 of Fig. 3,

Fig. 3 is a bottom plan view of the support shown in Fig. 1, and

Fig. 4 is a perspective view of one of the individual pads.

Referring to Figs. 1 to 4 of the drawing, the arch support proper consists of a body portion 10 in the form of an insole having a heel portion 11 and extending forwardly so that the forward end 12 will underlie the metatarsal arch of the foot of the user. The insole member is preferably made of a single piece of thin, relatively rigid material which is impervious to heat and moisture, such as a phenolic or other synthetic resin, or fibrous or laminated structures bonded by such resins.

The insole member is so shaped as to fit both the outline and the contour of the arch of a shoe, and when it is placed in position it will lie in contact with the customary insole of the shoe substantially throughout its entire area and will not raise the heel or any other portion of the foot to any undesirable extent.

A plurality of separate, interchangeable pads or cushion members 13 are mounted on the upper surface of the forward portion 12 of the insole member 10. These pads are preferably made of soft rubber, such as sponge rubber, and are formed with a rounded forward end 14 and a flat top area 15, and are tapered rearwardly from said flat top area as at 16 to terminate in a rear feather edge 17. The pads are formed with a flat bottom surface 18 (Fig. 4) provided with integral spaced attaching studs 19 formed with tapering sides to snugly fit the counterbored spaced openings 20 formed in predetermined positions, as will be hereinafter explained, in the insole member.

The holes 20 in the insole member are drilled after measuring the individual foot to be corrected so that each pad is mounted in precisely the proper position to support one joint without affecting the adjacent joint. The method of fitting will be explained in more detail later.

A cushion member 21 for the support of the tarsal or inner longitudinal arch is also mounted in predetermined position on the upper surface of the insole member 10. The cushion 21 may be formed with a relatively stiff base plate 22 and a resilient rubber pad 23 which forms the cushion

element and which is cemented or otherwise secured to the base plate. The cushion 21 is secured in position by screws 24 which pass through spaced holes 25 formed in predetermined position in the insole 10 and engage threaded openings in the stiff base plate 22. A metallic clamping plate 26 is placed on the under side of the insole member and the shanks of the screws pass through this plate so that when the screws are tightened, the insole will be firmly clamped between the plate 26 and the base plate 22.

According to the method of treatment in which the arch supports are to be used, the location of the several cushion sections is determined accurately for the particular foot to be treated. An insole blank of the appropriate size and shape is marked to show the location of each joint that is to be treated, and the twin holes 20 and 25 for mounting the pads are drilled, preferably with twin drills to insure accuracy.

Pads 13 of the proper thickness for initial arch adjustment are then buttoned in position in the holes 20 and a tarsal or os calcis pad is fastened in position by the screws 24.

Corrections must be made by degrees, as it is too painful to elevate dislocated bones more than a little at a time. The pads 13 are changed from time to time, being replaced by thicker pads until the final setting, for full correction, is reached. The replacement of the pads does not necessitate further foot measurement or fitting of a new support as the holes 20 insure that the new pads will always be properly located.

The devices illustrated are for the right foot; however, as will be obvious, the same structures with the parts reversed are used for fitting the left foot and it is not deemed necessary to duplicate the drawing and description to the extent of specifically illustrating the same.

While a preferred embodiment of the new support has been shown and described, it will be understood that the invention is not strictly limited to the details disclosed but that various modifications and changes in the details of construction and method of operation may be resorted to within the scope of the appended claims.

I claim:

1. An arch support comprising a comparatively thin and relatively stiff insole member having a portion extending beneath the metatarsal arch of a foot, and a plurality of resilient pads mounted on and exposed at the upper surface of said insole member in position to underlie selected metatarso-phalangeal joints of a foot.

2. An arch support for use in the individual treatment of a foot, comprising a relatively stiff insole member and a plurality of cushion members removably secured on the upper surface of said insole member, said cushion members being each positioned to support an individual metatarso-phalangeal joint of said foot when the arch support is in use.

3. An arch support comprising a relatively stiff insole member formed with pairs of spaced openings therein, a plurality of pads having spaced studs adapted to fit said openings to secure said pads in position on the upper surface of said insole, said pairs of openings being so positioned that each of said pads individually supports a metatarso-phalangeal joint of a foot to which said support is applied.

4. An arch support for use in the individual treatment of a foot, comprising an insole member and a plurality of individual pads secured to and exposed at the upper surface of said insole, said pads being positioned on said insole in the same relative position with respect to each other as are the metatarso-phalangeal joints of said foot.

5. An arch support for use in the individual treatment of a foot, comprising an insole member formed with a heel portion and a forward portion extending beneath the metatarsal arch of said foot, a plurality of cushion members mounted on the upper portion of the forward portion of said insole in the same relation to each other and to the heel portion as the corresponding metatarso-phalangeal joints of said foot, and a tarsal cushion member mounted on said insole in a position corresponding to the tarsal arch of said foot.

6. An arch support comprising an insole member and a plurality of metatarsal joint supports mounted on the upper surface of said insole member in spaced relation in accordance with the spacing of the corresponding metatarso-phalangeal joints of the foot to be treated.

7. An arch support comprising an insole member, a plurality of metatarsal joint supports mounted on the upper surface of said insole member in spaced relation in accordance with the spacing of the corresponding metatarso-phalangeal joints of the foot to be treated, and a tarsal cushion support mounted on the upper surface of said insole member in a position corresponding to the location of the tarsal arch of said foot.

8. An arch support comprising an insole member and a plurality of metatarsal joint supports mounted on the upper surface of said insole member in spaced relation in accordance with the spacing of the corresponding metatarso-phalangeal joints of the foot to be treated, each of said joint supports comprising a resilient cushion member formed with a rounded forward end portion and a flat top area and tapering rearwardly from said flat area.

9. An arch support comprising an insole member, a plurality of metatarsal joint supports mounted on the upper surface of said insole member in spaced relation in accordance with the spacing of the corresponding metatarso-phalangeal joints of the foot to be treated, each of said joint supports comprising a resilient cushion member formed with a rounded forward end portion and a flat top area and tapering rearwardly from said flat area, and integral attaching studs formed on the under surface of said cushion members, said insole member having openings formed therein for the reception of said studs whereby said cushion members are removably held in position.

10. An arch support comprising an insole member, and cushion means removably secured to said insole member and exposed at the upper surface thereof for contact with the foot, said cushion means including a plurality of sections each positioned beneath and individually supporting a metatarso-phalangeal joint of the particular foot to be treated.

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