May 6, 1930. C. A. FREE 1,757,904

SELF ADJUSTING ARCH SUPPORT

Filed Sept. 17, 1928

Fig. 1.

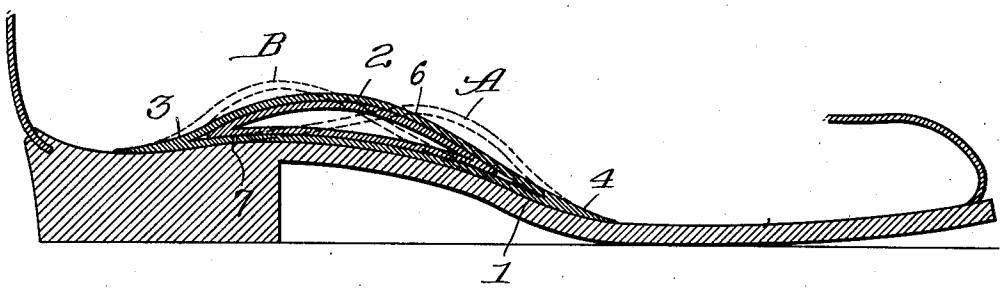


Fig. 2.

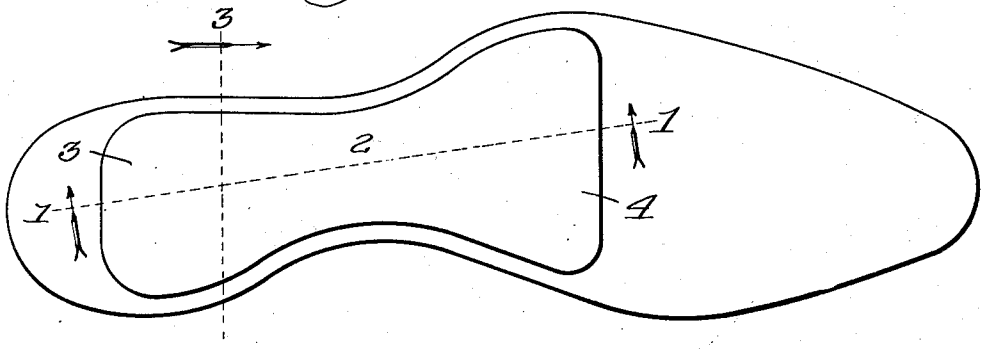


Fig. 3.

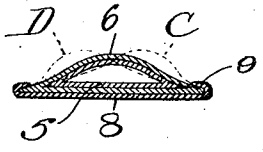
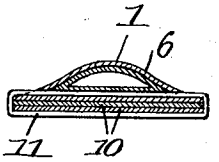


Fig. 4.



Inventor.
Chester A. Free,
By Dyrenforth, Dee, Chritton & Wills.
Attys.

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CHESTER A. FREE, OF ATTICA, INDIANA

SELF-ADJUSTING ARCH SUPPORT

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This invention relates to an arch-support, and more particularly to an air-containing pad type of arch-support.

One of the primary objects is to provide a support of simple and cheap construction which is self-adjusting in such a manner as to provide support for every portion of the arch during the walking operation or when the arch is at rest. Other objects and advantages will appear as the description proceeds.

The invention is described in the following specification and shown in the accompanying drawing, in which—

Figure 1 is a vertical sectional view of an air-containing arch-support embodying my invention, the section being taken as indicated at line 1 of Fig. 2 and the pad being shown as applied to the insole of a shoe; Fig. 2 is a plan view of the same; Fig. 3 is a sectional view, the section being taken as indicated at line 3 of Fig. 2; and Fig. 4 is a sectional view similar to that of Fig. 3, showing a modified arrangement in which lifts or inserts are used.

Referring to the drawing, 1 represents an air-containing pad, which may be made of molded rubber, or of any other suitable material. In the construction of pad 1, it is preferred to employ heavier rubber, or other material, for the construction of the bottom and a portion of the sides, while the top wall 2 is thinner and so constructed as to be more flexible. As illustrated, the rear portion 3 of pad 1 extends well back under the heel so as to form a seat therefor, and the front portion 4 extends a sufficient distance forward to contact with the ball of the foot.

Pad 1 may be molded in a single piece of rubber so as to provide stiff bottom and side portions and a flexible top portion 2. The air introduced into the pad or trapped therein during the molding operation (if more than sufficient to give the desired amount of cushioning support is reduced and the opening made for this purpose is sealed to prevent further escape of air. In this manner, there is held within the pad a pre-determined amount of air which will enable the flexible top portion of the pad to adjust itself to assume the contour of the arch when a slight pressure is applied to any portion of the pad. The top wall 2 will sag slightly when the contents of the pad are diminished by withdrawing air or other contents from it. It will be noted that in developing this condition on wall 2, a peculiar slackened surface is produced on the face of the pad which makes possible the self-adjustment feature of the arch-support.

It is obvious that materials other than air may be employed within the pad to give the desired adjustability to the support. Materials such as modelers' clay or liquids may be used. It is important that the contents of the pad be pliable or movable and that they be less than the full capacity of the pad chamber. The diminished contents produce a sagging face or wall which permits the periphery of the pad to be moved in different directions by external pressure, thereby accomplishing the desired adjustment to the arch.

As illustrated in Fig. 1, the flexible top portion 2 may assume the shape A or the shape B, or various other shapes, to accommodate itself to the movements and contour of the arch. Not only will the top portion 2 move in a forward and rearward direction, in the manner described, but it will also adjust itself in side directions, as illustrated in Fig. 3 by the dotted lines C and D.

Instead of employing a single molded rubber pad, an inner tube 5 of rubber or other flexible material may be used. The tube 5 may be protected and restricted to a desired range by a cover 6 of molded rubber, fabric, or the like. Cover 6 is constructed so as to be of the desired shape and size. In this type of construction, the inner tube 5 is supplied with the proper amount of air and may be inserted within cover 6 through the slit 7 on the bottom of the cover, or in any other desired manner. The cover 6 is provided, also, with a flexible top portion 2 and may, if desired, have reinforced side and bottom portions.

As illustrated in Fig. 3, a plate 8, which may be made of light metal, or other suitable material, is provided to support the pad 1. Plate 8 is provided with inturned flanges 9 which embrace the edges of pad 1 or cover 6. The shape of plate 8 is adapted to con-

form to the portion of the insole below the arch.

As illustrated in Fig. 4, inserts 10 may be employed under the pad to raise it to the desired height. These inserts are preferably held in position by an elastic band 11 which is secured to the bottom of the pad 1. If desired, a similar band may be employed to support the plate 8 in position.

In the operation of the device, the pressure exerted by the heel or ball of the foot, or by any other portion of the foot, will cause the flexible top wall 2 to assume the shape of that portion of the arch with which it makes contact, thus providing an even pressure which will support alike all parts of the arch. As the shape of the arch changes in the walking operation, the pressure exerted upon different parts of the pad will cause it, at each instance, to assume a shape conforming to the contour of the arch.

The foregoing detailed description has been given for clearness of understanding only, and no unnecessary limitations should be understood therefrom, but the appended claims should be construed as broadly as permissible, in view of the prior art.

What I regard as new, and desire to secure by Letters Patent, is:

1. In a device of the character set forth, a pad member adapted to contain fluid, said pad member being provided with a flexible top wall and having a pre-determined fluid content which permits ready readjustment of said top wall of the pad member under pressure, and inserts below said pad member and secured thereto by an elastic band.

2. In a device of the character set forth, a pad member adapted to contain movable material, said pad member being provided with a flexible top wall and having a pre-determined content which permits ready adjustment of said top wall of the pad member under pressure, inserts below said pad member, and means for releasably securing said inserts thereto.

3. In a device of the character set forth, a hollow pad member provided with a flexible top wall, a second pad member disposed within said hollow pad member and adapted to contain movable material and having a predetermind content which permits ready adjustment of said top wall of said first-mentioned pad member under pressure, inserts below said first-mentioned pad member, and means for releasably securing said inserts thereto.

CHESTER A. FREE.