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July 7, 1925. 1,544,547

G. S. BARKER

PNEUMATIC ARCH SUPPORT

Filed Oct. 30, 1923

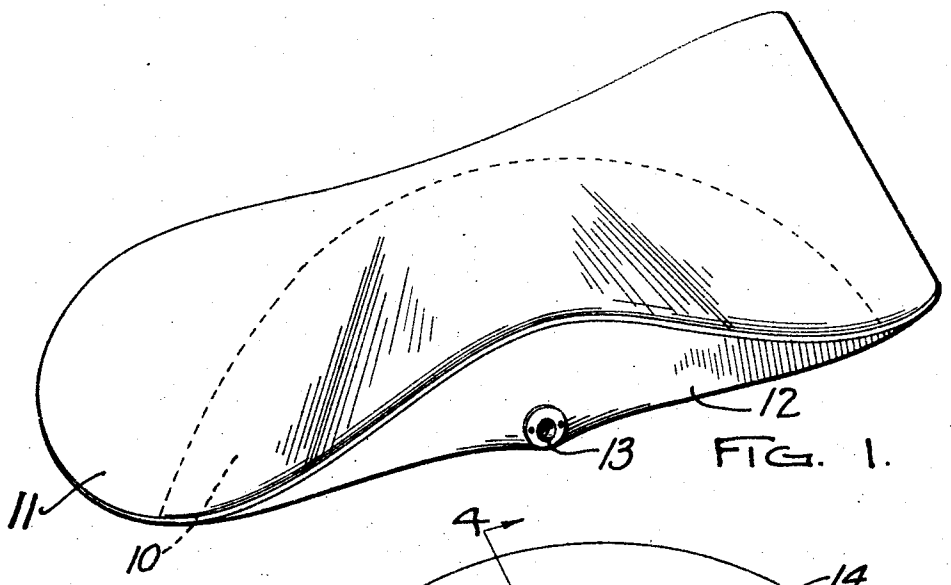


FIG. 1.

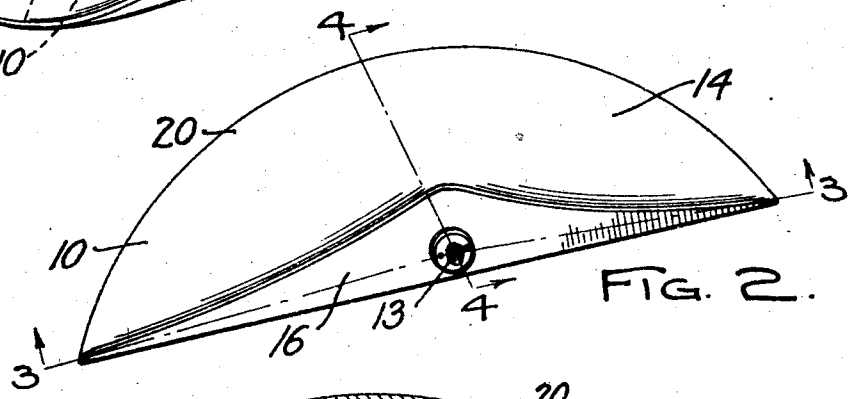


FIG. 2.

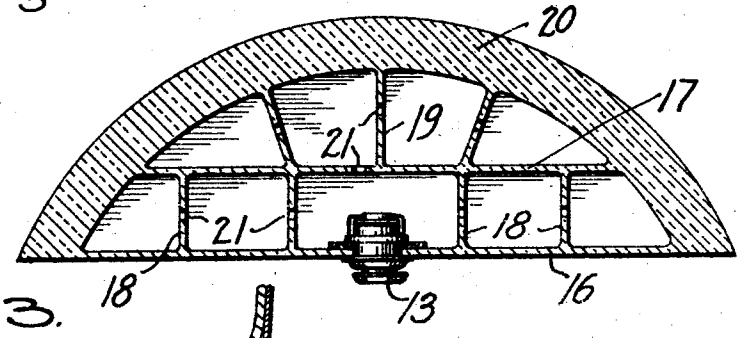


FIG. 3.

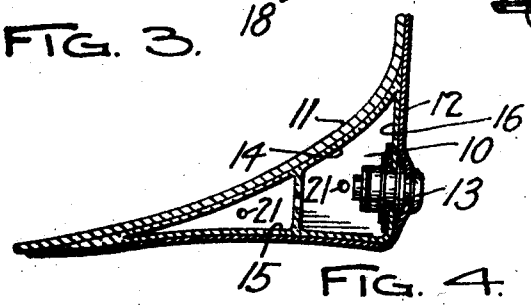


FIG. 4.

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Patented July 7, 1925. 1,544,547

UNITED STATES PATENT OFFICE.

GEORGE S. BARKER, OF DENVER, COLORADO.

PNEUMATIC ARCH SUPPORT.

Application filed October 30, 1923. Serial No. 671,728.

To all whom it may concern:

Be it known that I, GEORGE S. BARKER, a citizen of the United States, residing at Denver, in the county of Denver and State of Colorado, have invented certain new and useful Improvements in Pneumatic Arch Supports, of which the following is a specification.

This invention relates to pneumatic devices for supporting the arch of the foot and has for its principal object the construction of an arch support of this type in which it will be impossible for the weight of the user to distort the useful shape of the support by forcing air from that part of the support which is supporting the greater weight to those parts under less outside pressure, thereby defeating the primary purpose of an arch support.

When an arch support is placed under the foot of a person having fallen arches or what is commonly known as "flat feet," practically the entire weight of the person is brought to bear on the highest point of the arch support. This is necessarily so since the support is shaped to conform to the normal foot, which arches inward, while the wearer's foot has little or no inward arch and must therefore contact with the high point of the arch support. The purpose of the arch support is to force and hold the foot of the wearer in the normal arch to which the arch support conforms.

All types of pneumatic or fluid containing arch supports, of which the applicant is aware, fail to accomplish this purpose for the reason that when the pressure of the user is exerted, as above noted, the air will flow from that part of the support subjected to the first and greatest pressure, to-wit, the apex of the arch, to other parts of the support until the pressure is neutral at all points and the arch support has conformed to the fallen arch of the user instead of causing the user's fallen arch to conform to the normal arch of the arch support. This causes the support to swell, alternately under the heel and ball of the foot as the wearer is walking, where it accomplishes no useful purpose and causes great discomfort to the wearer. It is for this reason that pneumatic arch supports have not been a commercial success.

With applicant's invention it is impossible for the arch support to conform itself to the arch of the user to any perceptible extent and, as a result, the arch of the foot is forced to conform itself to the normal arch of the support.

Other objects and advantages reside in the detailed construction of the invention, which result in simplicity, economy, and efficiency, and which will become more apparent from the following description.

In the following detailed description of the invention reference is had to the accompanying drawing which forms a part hereof. Like numerals refer to like parts in all views of the drawing and throughout the description.

In the drawing:—

Figure 1 is a perspective view of the applicant's complete arch support.

Figure 2 is a perspective view of the pneumatic core used in the device.

Figure 3 is a horizontal plane section taken on the line 3—3, Fig. 2.

Figure 4 is a vertical cross section through the pneumatic core, taken on the line 4—4, Fig. 2.

The invention comprises a hollow pneumatic core 10, a relatively heavy sole 11, and flexible casing 12. The core 10 is provided with an air valve 13 which, however, forms no part of the present invention.

The principal object of the invention is accomplished by the novel construction of the core 10 acting in conjunction with the relatively stiff, formed sole 11.

Core 10 is a hollow air container of elastic material, such as rubber, having an upper wall 14 shaped to conform to the normal foot arch, a flat lower wall 15 and a flat side wall 16. The upper and lower walls 14 and 15 join along the side of the core in a knife edge 20. Running longitudinally through the approximate middle of the core 10 throughout the entire length thereof is a longitudinal partition 17.

Transverse partitions, 18, connect the longitudinal partition 17 and the side wall 16. Radial partitions, 19, connect the longitudinal partition 17 and the knife edge 20, of the core 10.

The partitions 17, 18, and 19, all firmly connect with both the bottom wall 15 and the top wall 14, and are preferably formed of a material having flexibility but little or no elasticity.

Small openings, 21, are formed in each of the partitions to allow the air from the valve 13 to reach all parts of the core. It

will be noted that the entire interior of the core 10 is divided into a series of small cells approximately equal in area.

In use the greatest outside pressure will come, as before described, over the middle cells. This will naturally tend to force the air through the openings 21 into the outer cells but, as the walls of the outer cells are all tied together by the inelastic partitions 17, 18, and 19, they can expand but slightly and will not distort and allow the support to conform to the shape of the applied pressure. The result is that the air pressure in the entire support will increase to support the outside pressure but the core will still conform to its original shape.

The upper wall 14 is prevented from bowing outward between the partitions by the stiff sole 11 against which it is tightly cemented. The lower wall 15 and the side wall 16 cannot bow outward as they are supported by the shoe of the user.

The sole 11 is of leather and is molded and shaped to conform to the shape of the core 10 before being cemented thereto.

After the core and sole are fixed together, the casing 12 of soft flexible leather is cemented around the side and bottom of the entire arch support completing the article.

While a specific form of the improvement has been described and illustrated herein, it is desired to be understood that the same may be varied, within the scope of the appended claims, without departing from the spirit of the invention.

Having thus described the invention, what is claimed and desired secured by Letters Patent is:—

1. In a pneumatic arch support, the combination of an elastic air container shaped to fit to the normal foot arch; a continuous vertical longitudinal partition extending the full length of said container and vertical transverse partitions connecting said longitudinal partition with the walls of said container, all of said partitions connecting both with the top and with the bottom of said container and each of said partitions being provided with an opening.

2. In a pneumatic arch support, the combination of an elastic air container shaped to fit to the normal foot arch; a vertical longitudinal partition extending the full length of said container and vertical transverse partitions connecting said longitudinal partition with the walls of said container, all of said partitions connecting both with the top and with the bottom of said container and being non-elastic and each of said partitions being provided with an opening.

In testimony whereof, I affix my signature.

GEORGE S. BARKER.