Oct. 8, 1946. M. MARGOLIN 2,408,792

ARCH SUPPORT

Original Filed Aug. 17, 1939

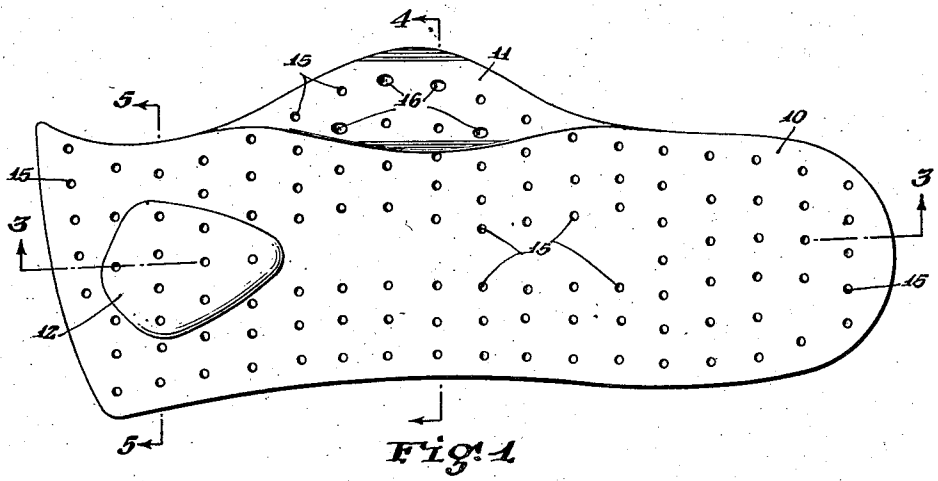


Fig. 1

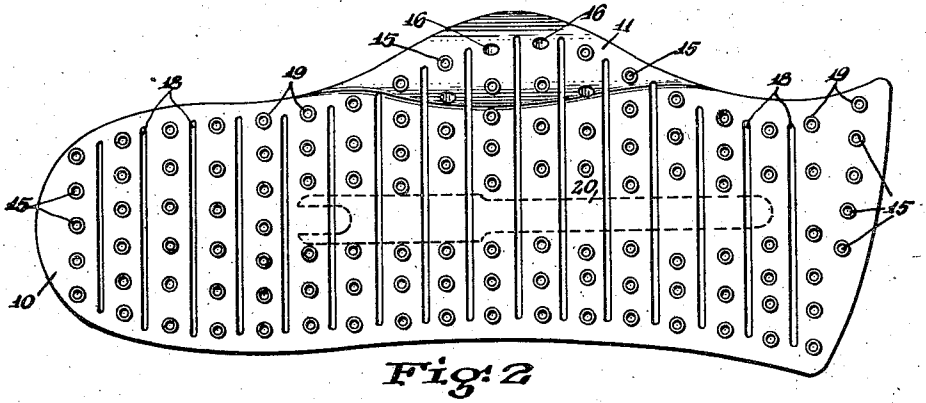


Fig. 2

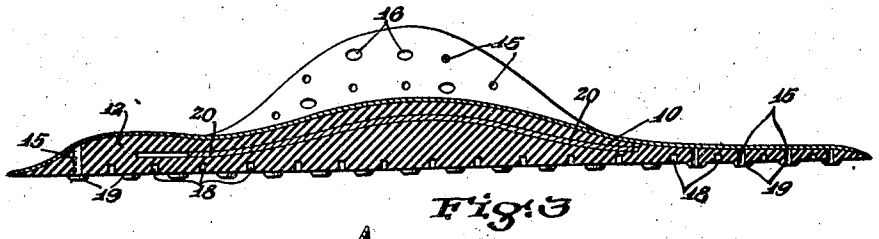


Fig. 3

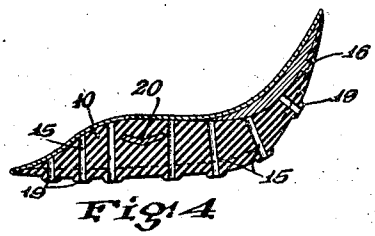


Fig. 4



Fig. 5

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UNITED STATES PATENT OFFICE

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ARCH SUPPORT

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Original application August 17, 1939, Serial No. 290,559. Divided and this application January 1, 1943, Serial No. 470,994

5 Claims. (Cl. 36—3)

1

This application is a division of application Serial No. 290,559, filed August 17, 1939 for Resilient breathing insole, now Patent No. 2,307,416.

My invention relates to an arch support and more specifically to an arch supporting device comprising expanded rubber which is provided with such construction as to make possible a constant and forced breathing in the shoe.

The arch support of my invention generally comprises an integrally molded resilient and flexible material which is highest along the center of its longitudinal axis and tapers down from there to a feather edge thickness at its periphery.

A rigid member may be employed along the longitudinal axis in order to provide the necessary rigid base support for the arch support. Across the areas of appreciable thickness in this device extend transverse grooves of substantial width having a substantially rectangular cross-section. When this device is employed in the shoe and is flexed in the act of walking, the grooves are alternately expanded and contracted to provide a forced breathing which forces air circulated thereby up through perforations which extend through the thickness of this arch support and which perforations are located over the entire areas of this arch support and spaced at a small distance one from the other.

The arch support above generally described may be given an upper cover of leather which is perforated in such a manner so that the perforations correspond to the perforations in the resilient material which comprises the arch support. In this way the breathing is not interfered with. The arch support is adapted to be placed within the ordinary shoe in order to correct the positioning of the arch of the wearer. It also acts as a resilient cushion to the foot of the wearer and may carry in the metatarsal region an arch support which consists in an integrally molded raised area of rubber.

At the side of my arch support and extending upwardly and around the long arch of the foot is an extension to afford support for the longitudinal arch. In order to gradually build up the support in this particular area, I provide recesses in the form of holes larger than the ordinary air perforations located in this area which are adapted to receive projections which are carried by cookies. These cookies may be added on to the arch support to build up the thickness to get additional height in this area. These cookies may be in the form of relatively thin resilient wafers which carry projections on their underside and recesses on their upper side so that a multi-

2

plicity of such cookies may be superimposed one upon the other in order to build up and provide the ultimate desired thickness in this particular area, as shown in my co-pending application Serial No. 272,364, now Patent No. 2,207,632.

In order to facilitate this forced breathing I may provide communicating grooves or arteries which connect the transverse grooves with the perforations through the arch support so that the air that is compressed and forced from these transverse grooves in the act of walking may be quickly and fully dispersed through said grooves or arteries, through said perforations and hence in contact with the foot of the wearer. These grooves or arteries may be in the form of grooves molded in the bottom surface of the resilient material such as rubber or they may be in the form of channels in the interior of the molded material, said channels extending through the molded material and connecting the respective grooves and perforations.

I have found that these channels may be from a commercial standpoint formed by molding them as grooves on the bottom surface. When I employ these connecting grooves or arteries, I may or may not use the reinforcing bosses at the ends of the perforations since with these grooves the bosses may not be necessary for proper breathing action.

Accordingly, it is the object of my invention to provide a novel arch supporting member for a shoe consisting of a resilient material such as expanded rubber, said arch support being provided with means for causing forced breathing therethrough.

It is a further object of my invention to provide a novel cellular rubber arch support with a rigid support positioned therein.

It is a further object of my invention to provide a novel arch support in which grooves are positioned on the flexible portions in order to provide forced breathing through perforations located through the arch support area.

Referring now to the drawing,

Figure 1 is a plan view of the molded arch support of my invention.

Figure 2 is a bottom view of the arch support of Figure 1.

Figure 3 is a cross section taken along the line 3—3 of Figure 1.

Figure 4 is a cross-section taken along the line 4—4 of Figure 1.

Figure 5 is a cross section taken along the line 5—5 of Figure 1.

Referring now more specifically to the draw-

ing, in Figure 1, 10 represents the molded resilient arch support of my invention. This arch support is adapted to be superimposed on the insole of a shoe to provide any desired support of the arch and is formed for example by molding expanded rubber of the configuration shown. 11 represents the U-turned long arch support and 12 represents an integrally molded metatarsal arch support. Perforations 15 are homogeneously spaced throughout the area of the arch support to provide proper breathing and air for the foot.

In the long arch support are recesses 16 which are adapted to receive mating projections by means of which the height of this arch support is increased in this particular area as shown in Figure 4.

In Figure 2 which shows the bottom of this arch support there are transverse grooves 18 which extend partially across the arch support and which, upon flexing, drive air through the perforations 15 to the area of the foot.

At the bottom of the perforations 15 are bosses 19 which increase the softness of the arch support and which assist in the passage of air from the groove 18 through the perforations 15.

As shown by dotted lines in Figure 2 a rigid metal support 20 may be employed, as by molding within the arch support, to assist in maintaining the resilient arch support in proper shape. The arch support construction of my invention makes possible an integrally molded resilient unit of expanded rubber by means of which the ordinary difficulties of accustoming the foot to an arch support are obviated. The resilient material of which this arch support is made makes the support extremely comfortable.

Hitherto, these supports have been made of a metal frame work covered with leather and such arch support is decidedly uncomfortable for the foot. A rubber support has been impractical largely because of the problem of foot comfort. By means of the system of forced breathing which I effect as shown by the grooves and perforations, I have obviated the difficulties hitherto experienced in this art. All portions of the base area of my arch support that are flexed carry the transverse grooves which, when flexed, force air through the perforations to the foot.

Thus it can be seen that my invention comprises a novel resilient arch support molded preferably from expanded rubber such as sponge rubber or closed cell rubber and I provide for comfort features in the form of the resiliency of the molded material which has the integrally formed metatarsal and long arch. By long arch I mean the arch which extends from the heel to the ball of the foot along the inner side of the foot.

I have shown many novel forms in which I can obtain the desired forced breathing effects which add so greatly to the comfort of my construction. It is this particular breathing action which makes practical the rubber arch support here shown since without this decided discomfort would result.

Although I have stated hereinbefore that the resilient arch support of my invention may be formed of resilient material and I have particularly mentioned expanded rubber, it is understood that I may use other types of resilient material and specifically by way of example, but not by way of limitation, I include cork, resilient fibrous materials, and resilient synthetic plastics, expanded or not.

I wish it to be understood that the many examples and modifications I have shown in my invention are for the purpose of broadly explaining the same and that I intend to be limited not by the specific construction by means of which I obtain the desired results but only by the appended claims.

I claim:

1. An arch support comprising a molded expanded rubber, perforations through said arch support, transverse grooves across the bottom of said arch support, and bosses at the bottom of said perforations.

2. An arch support comprising a molded expanded rubber, perforations through said arch support, transverse grooves across the bottom of said arch support, said grooves having terminating walls at each end so as to cause air to be pumped up through said perforations.

3. An arch support comprising a molded expanded rubber, perforations through said arch support, transverse grooves across the bottom of said arch support, said grooves having terminating walls at each end so as to cause air to be pumped up through said perforations, and bosses at the bottom of said perforations.

4. An arch support comprising a molded expanded rubber, a sidewardly and upwardly extending integral lap, perforations through said arch support, and transverse grooves across the bottom of said arch support, said grooves having terminating walls at each end so as to cause air to be pumped up through said perforations.

5. An arch support comprising a molded expanded rubber, a sidewardly and upwardly extending integral lap, perforations through said arch support, and transverse grooves across the bottom of said arch support, said grooves having terminating walls at each end so as to cause air to be pumped up through said perforations, and bosses at the bottom of said perforations.

MEYER MARGOLIN.