

C. H. DRUCKENMILLER.
 ARCH SUPPORT.
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1,241,832.

Patented Oct. 2, 1917.

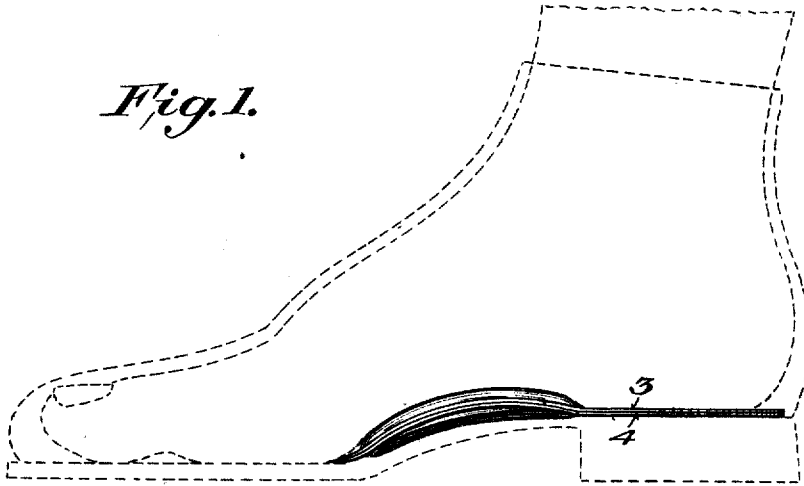


Fig. 1.

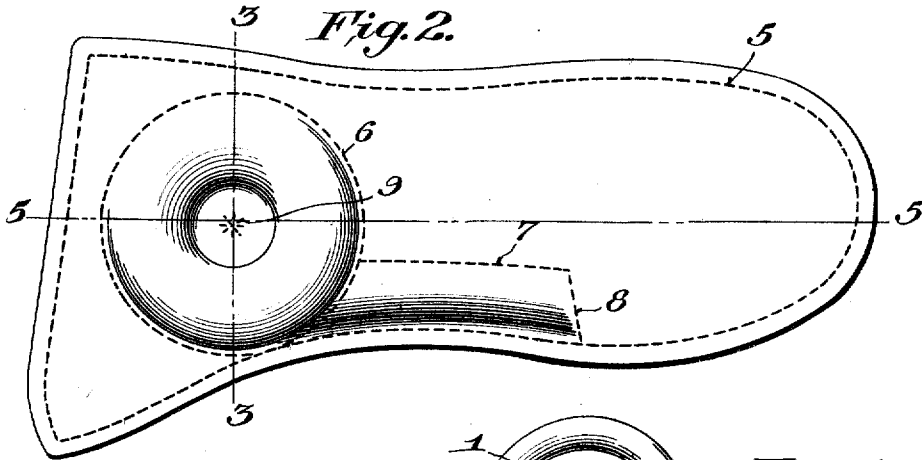


Fig. 2.

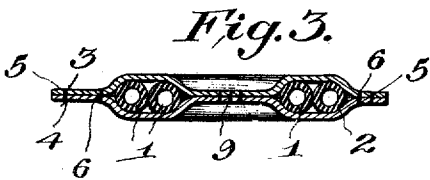


Fig. 3.

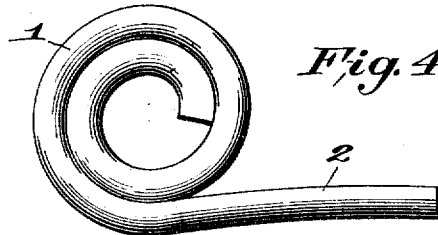


Fig. 4.

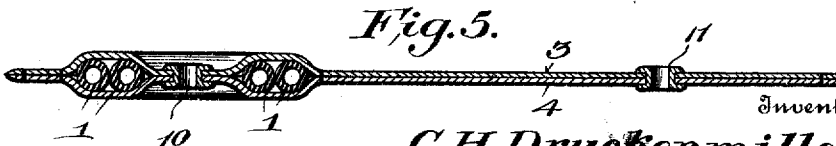


Fig. 5.

Witness

Chas. L. Grischauer.
A. A. Ege

Inventor
C. H. Druckenmiller,

By

W. J. Shepard,
 Attorney

UNITED STATES PATENT OFFICE.

CHARLES H. DRUCKENMILLER, OF CLARENDON, VIRGINIA.

ARCH-SUPPORT.

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To all whom it may concern:

Be it known that I, CHARLES H. DRUCKENMILLER, a citizen of the United States, residing at Clarendon, in the county of Alexandria and State of Virginia, have invented certain new and useful Improvements in Arch-Supports, of which the following is a specification.

This invention relates to arch supports and is designed to provide an elastic support for the arch portion only of the foot. While the present embodiment of the invention, as shown in the accompanying drawing, is that of an insole, the invention may be built directly in a shoe.

In carrying out the present invention, I employ an elastic tube as the arch supporting element. This tube is wound at one end into circular form having any desired number of coils, the other end portion of the tube extending rearwardly in a straight line from the coiled portion at one side thereof. The coiled portion is designed to be located immediately in rear of the ball of the foot, while the rear end of the tube terminates substantially at the front of the heel of the foot, whereby the entire support is located beneath the arch of the foot, and the weight of the user which comes on the heel and ball of the foot does not also come upon the improved arch support.

In the drawing,

Figure 1 is an edge elevation of an arch support constructed in accordance with the present invention and shown in its operative relation to a foot and shoe, the latter members being shown in dotted lines

Fig. 2 is a plan view of the arch support of the present invention embodied in the form of an insole.

Fig. 3 is a cross-sectional view on the line 3—3 of Fig. 2.

Fig. 4 is a detail view of the elastic tube removed from between the top and bottom plies of the insole.

Fig. 5 is a longitudinal sectional view on the line 5—5 of Fig. 2, showing a slight modification.

Like characters of reference designate corresponding parts in each of the figures of the drawing.

As hereinbefore indicated, the present invention involves the use of a rubber tube,

such for instance, as shown in Fig. 4 of the drawing, wherein it will be seen that one end portion 1 of the tube is wound in a flat circular coil, while the other end portion 2 extends in a straight line substantially tangentially with respect to the next adjacent coil of the tube. The ends of the tube may be open or closed, as desired. Good results have been obtained with both ends of the tube open.

The tube in the form shown in Fig. 4 is inserted between the upper and lower plies 3 and 4 of an insole of usual form. These plies are secured together in any suitable manner, for instance by means of stitching 5 extending around the entire periphery of the insole. It is unnecessary to have the insole the full length of the shoe, it being sufficient to have it extend from the heel to about the ball of the foot, so that it may be effectually held in place by the heel and ball of the foot. The coil 1 is located substantially midway between the opposite longitudinal edges of the insole and disposed slightly in rear of the front edge thereof so as to lie adjacent but immediately in rear of the ball of the foot, as clearly shown in Fig. 1 of the drawing, while the part 2 of the coil extends alongside the inner edge of the insole and terminates adjacent and slightly in front of the heel. The elastic tube may be held in place in any suitable manner, preferably by a row of stitching 6 extending around the coiled portion of the tube and a further row of stitching 7 extending along the inner side of the straight part 2 of the tube and thence across the rear end of the tube, as at 8. The stitching 6, 7 and 8, and that portion of the stitching 5 which runs alongside of the tube portion 2, produce pockets within which the tubing is confined, it of course being understood that the stitching extends entirely through the upper and lower plies of the insole but not through the tube, except where the circular row of stitching 6 passes across the forward end portion of the part 2 of the tube. A suitable fastening, such for instance as stitches 9, shown in Figs. 2 and 3, or a rivet 10, as shown in Fig. 5, may be located at the center of the coil 1 so as to complete the circular pocket for containing the coiled portion 1 of the tube.

If desired, the heel portions of the insole may be secured together by an eyelet 11, as shown in Fig. 5.

In practice, the device is inserted in a shoe, as shown in Fig. 1, with the heel portion of the insole lying in the heel of the shoe and the elastic tube lying across the arch of the shoe, whereby the heel of the wearer rests upon the heel of the insole while the ball of the foot of the wearer rests on the forward portion of the insole in front of the coiled portion of the elastic tube, whereby the insole is held in place, without other fastening devices, and the elastic arch support is thereby maintained in proper relation to the foot and supports the arch in a natural and effective manner. The coiled portion of the tube presents the necessary supporting area to the foot immediately in rear of the ball thereof, while the substantially straight or tangential portion 2 of the tube extends rearwardly beneath the higher portion of the arch of the foot at the inner side thereof, whereby the present support is disposed in proper relation to the arch of the foot so as to support the same at the places where the support is required. Inasmuch as the arch of the foot inclines transversely downward from the inner to the outer side of the foot, it is unnecessary to provide other tube portions alongside of the tube portion 2, as it has been found that the single tube portion 2 is an effective arch support at this point, and any additional tube sections alongside of the part 2 are uncomfortable and undesirable.

From the foregoing description, it will be noted that the insole does not constitute the arch support, but is used merely as a carrier or holder for the elastic support formed by the tube. The pressure of the ball of the foot and the heel of the foot does not come upon the elastic arch support, but does come upon the retaining flaps formed by the front and rear portions of the insole, whereby the arch support is effectually held in place.

Air pressure is not relied upon to form the elastic support, as it is merely the elasticity of the tube itself which gives the necessary elasticity to the support.

The device as positioned in Fig. 2 of the drawing is for the right foot. By inverting the device it can be used for the left foot. In other words, it is not necessary to make the device in rights and lefts, as either side of the device may be used as the upper side, and consequently any one of the devices may be used for either foot. However, from a commercial standpoint, it may be found desirable to give one side of the device such a finish as will insure an efficient frictional engagement with the bottom of the shoe, while the top surface may be given a smooth and soft finish so as to be comfortable to the foot of the wearer.

As best shown in Figs. 3 and 5 of the drawing, it will be seen that the tubing projects equally at opposite sides of a central plane extending longitudinally through the device, which also permits of the device being used either side up.

By employing tubing of different diameters and different thicknesses, the degree of elasticity may be varied to suit different requirements.

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

1. An elastic arch support comprising elastic tubing disposed in a flat coil, the length of the device being such that the front portion of the coil will lie adjacent and in rear of the ball of the foot, and the rear portion will lie in front of the heel of the foot.

2. An elastic arch support comprising elastic tubing disposed in a flat coil and a portion extending rearwardly from the coil, the length of the device being such that the front portion of the coil will lie adjacent and in rear of the ball of the foot, and the rear portion will lie adjacent and in front of the heel of the foot, substantially as and for the purpose described.

3. An elastic arch support comprising elastic tubing disposed to form a pad and having a tube portion extending rearwardly from the pad at one edge thereof, the length of the elastic arch being such that the forward portion thereof terminates adjacent but short of the ball of the foot and the rear end terminates short of and adjacent the heel of the foot.

4. An elastic arch support comprising elastic tubing disposed in a flat coil and a portion extending rearwardly from the coil, the length of the device being such that the front portion of the coil will lie adjacent and in rear of the ball of the foot, and the rear portion will lie adjacent and in front of the heel of the foot, a flap secured to the forward end of the elastic arch and adapted to lie beneath the ball of the foot, and another flap extending from the rear end of the arch support to lie beneath the heel of the foot.

5. An elastic arch support comprising elastic tubing disposed to form a pad and having a tube portion extending rearwardly from the pad at one edge thereof, the length of the elastic arch being such that the forward portion thereof terminates adjacent but short of the ball of the foot and the rear end terminates short of and adjacent the heel of the foot, a flap secured to the forward end of the elastic arch and adapted to lie beneath the ball of the foot, and another flap extending from the rear end of the arch support to lie beneath the heel of the foot.

6. An arch support comprising an insole including upper and lower plies, and elastic tubing disposed between the plies and coiled to form a pad lying adjacent and in rear of the ball portion of the sole, the rear portion of the pad terminating short of the heel portion of the insole.

7. An arch support comprising an insole, and elastic tubing included in the insole and disposed to form a pad located adjacent and in rear of the ball portion of the insole, there being a tube portion extending rearwardly from the pad and terminating short of the heel of the insole.

8. An arch support comprising an insole having top and bottom plies, an elastic tubing disposed between the plies and coiled to form a pad lying adjacent and in rear of the ball portion of the insole, there being a tube portion extending rearwardly from the pad along the shank of the insole and adja-

cent the inner edge thereof, said tube portion terminating short of the heel portion of the insole.

9. An arch support comprising an insole including upper and lower plies, elastic tubing disposed between the plies and wound to form a flat coil disposed adjacent and in rear of the ball portion of the insole, there being a tube portion extending rearwardly from the coil and along the shank of the insole adjacent the inner edge thereof, said tube portion terminating short of the heel portion of the insole, and stitching extending through the plies of the insole and following the configuration of the tubing and forming a pocket in which the tubing is contained.

CHARLES H. DRUCKENMILLER.

Witnesses:

E. W. SHEPARD,
A. A. EGE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."