

1,417,600.

Patented May 30, 1922.

Fig. 1.

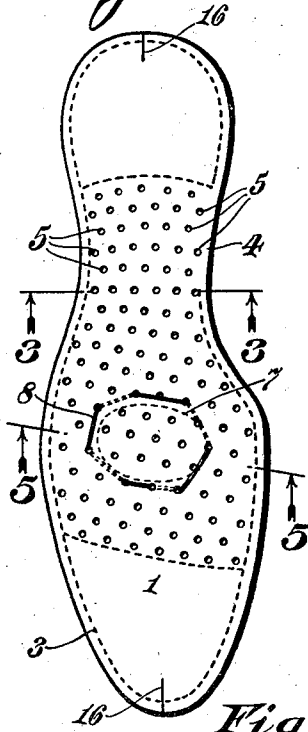


Fig. 2.

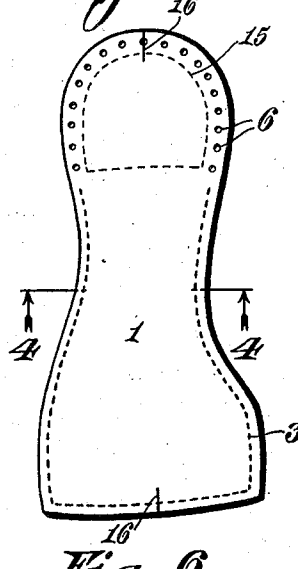


Fig. 3.

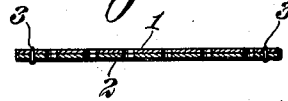


Fig. 4.

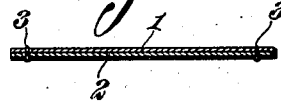


Fig. 5.

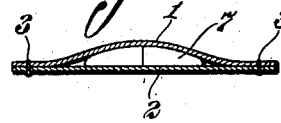


Fig. 7.

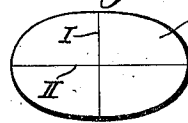


Fig. 8.



Fig. 9.



Fig. 10.



Fig. 11.

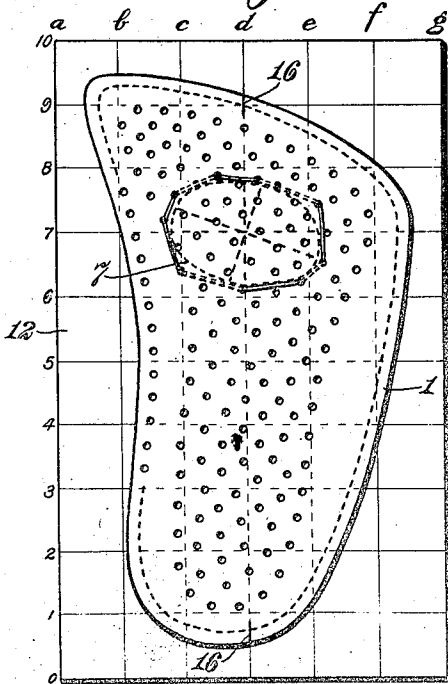


Fig. 6.

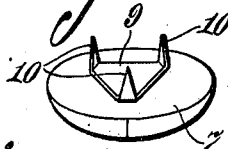


Fig. 12.

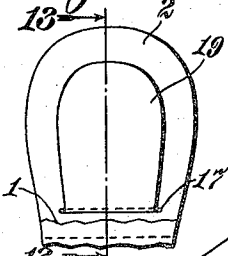
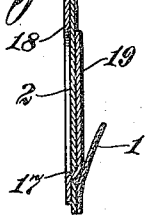


Fig. 13.



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# UNITED STATES PATENT OFFICE.

LUDWIG GUTMANN, OF ST. LOUIS, MISSOURI.

## ARCH SUPPORT.

1,417,600.

Specification of Letters Patent. Patented May 30, 1922.

Application filed June 11, 1917. Serial No. 174,017.

*To all whom it may concern:*

Be it known that I, LUDWIG GUTMANN, a citizen of the United States, and residing at St. Louis, Missouri, have invented the new and useful Improvement in Arch Supports, of which the following is a specification.

This invention relates to arch supports and more particularly to that type adapted to be inserted into a shoe and laid on the inner sole.

The failure of practically all wholesale arch supports can be attributed to the fact that for each given size, the corrections are made with the same support, the arch supporting pad being placed in the same position with only a certain limited amount of variation. It is a well known fact, however, that the bones of the foot of no two persons wearing the same number shoe, are alike either in width or in length; this is also true of the lengths of arches. The result is, therefore, that while a few may obtain relief by the arch support as bought and as corresponding to the size of shoe, in the vast majority of cases, a physician must be consulted.

A specialist makes an arch support to give the proper adjustment to the individual case. The specialist attempts not only to remove the pain, but also to bring the weakened or partly displaced bones into their normal positions. This cannot, of course, be done with the ordinary arch support as found on the market, since in the wholesale arch support, the position of the pad is predetermined and fixed.

One of the objects of this invention, therefore, is to provide an arch support in which the pad is capable of wide and unrestricted adjustment, so that this pad may be positioned to suit the particular case to be treated, as also to adapt the pad to the individual needs.

Further objects will appear from the detail description taken in connection with the accompanying drawing, in which,

Figure 1 is a plan of an insole of an arch support embodying this invention;

Figure 2 is a view similar to Figure 1, but showing another embodiment of this invention;

Figure 3 is a section on the line 3—3, Figure 1;

Figure 4 is a section on the line 4—4, Figure 2;

Figure 5 is a section on the line 5—5, Figure 1; showing the pad in position;

Figure 6 is a detail perspective view of one form of pad;

Figure 7 is a plan of another form of pad;

Figure 8 is a side elevation;

Figure 9 is a view of another form of pad;

Figure 10 is a view of still another form of pad; and,

Figure 11 is a view showing a chart.

Figure 12 is a detail showing means for attaching the insole to the shoe; and,

Figure 13 is a section on the line 13—13, Figure 12.

Referring now to Figures 1, 3, 5, 6, 7 and 8, the arch support as shown, comprises an inner sole embodying connected pieces 1 and 2, which are stitched on the dotted lines 3, to provide a pad receiving pocket of unrestricted area. The top piece 1 is preferably constructed of thin, soft leather, while the bottom piece 2 may be constructed of canvas or any other suitable material. The stitching is interrupted at one side, as shown at 4, to provide an opening adapted to receive the pad, while both pieces are provided with numerous perforations 5, for a purpose hereinafter to be described.

In the construction shown in Figures 2 and 4, the pieces 1 and 2, are left unperforated, and the line of stitching 3, is interrupted at the heel, but a line of perforations 6, continue the line of stitches around the heel. The insole is, furthermore, shortened, as it will be obvious that the front part omitted, extends beyond the arch, and a pad need never be placed at that point.

The pad 7 is constructed of leather, felt or any other suitable material, and of a shape depending upon the correction to be made. Thus, the pad shown in Figures 6 to 8, inclusive, forms a suitable support for one or more of the metatarsal bones; while Figure 9 shows an oblong pad suitable for the longitudinal arch. The pads are provided with reference lines I—II—III—IV, for a purpose hereinafter to be described.

After the pad has been inserted in the pocket formed by the connected pieces 1 and 2, the pocket may be closed by lacing through the perforations 5 or 6, in Figures 1 and 2, respectively. This lacing is preferably a soft, fine, but strong thread, so that it will not protrude above the face of the leather piece 1, and will, therefore, not chafe the

foot. The pad may be adjusted to any suitable position over the surface of the insole, and when in position, will be retained on account of the fact that it is located in a pocket, and movement of the foot over the foot engaging piece 1, can, therefore, not operate to shift this pad to any extent, especially since the pressure of the foot will soon cause the leather piece 1 to conform to the pad and pack around the same. This packing will, therefore, not only retain the pad in position, but also provide a gradually sloping surface from the face of the insole to the apex of the pad. In order, however, to securely retain the pad in position, a fine, soft, but strong thread 8, may be threaded through the perforations 5, around the pad in its adjusted position in the pocket, so as to provide a smaller and fixed pocket. As an alternative or in conjunction with the lacing means, the pad may, as shown in Figure 6, be provided with a small plate 9, having short prongs 10, adapted to engage the canvas piece 2, and thus securely hold the pad in position. Furthermore, the pad may, as an alternative, as shown in Figure 8, be provided with a rubber face 11, which may or may not be provided with an adhesive to securely retain the pad in position. The perforations 5 will, moreover, provide a ventilated insole.

The pocket formed at the heel may serve a further purpose of providing means for overcoming strains in the ankles, knees and hips, due to the defective position of the foot in the shoe, which causes a one-sided wearing of the heel. This strain is overcome by placing in the pocket at the heel, a pad 15, Figure 2, similar in section to that shown in Figure 10, but of less height, the high part being placed on the side where the heel runs over or tends to run over.

Figure 10 shows the pad comprising an envelope 13 of leather or any other suitable material, having a filling of paraffin treated sawdust, or any other granular or suitable body material which will adapt itself to the shape of the foot when the pad is in the pocket. A fibrous substance, such as sawdust, impregnated with a water-proof viscid substance, such as paraffin, gives the best results, as the impregnated substance is thereby itself rendered viscid free to yield and pack when in use. Where such a pad is used, the heat evolved from the foot while in the shoe, will act to soften the impregnation or paraffin, and will, therefore, cause the impregnated fibrous filling to pack in the shoe so as to conform itself in the shape of the hollow or projection immediately above this pad. Of course, as this impregnated filling becomes more and more packed, it will gradually conform itself to the proper shape, and the pocket filling will retain the final correct shape and will not then change, because of the confinement of the filling. In this con-

struction, therefore, the pad will adapt itself to the proper shape required, and after becoming packed, will retain that shape.

Figure 11 shows a chart 12, laid off on any suitable system of coordinates, as shown. On this chart may be impressed, laid off or drawn, the outline of the specific foot under consideration, and the position thereon indicated where the correction is to be made with relation to the lines on the chart. This impression can be obtained in any manner known to those skilled in the art. A good method or process for obtaining this impression is to use a viscous grease, such as tallow, which will make a clear outline, and will not "run" to any extent. In practice, the tallow is used in connection with a compound, such as graphite or crayon shavings and rubbed into the sole of the foot, and an impression made on the paper. This will not only give a clear outline of the foot, but will also show by the shade of the impression, where the correction is to be made.

The outline of the foot and the location of the defect having been indicated on the chart, the position of the pad may be readily determined. Figure 11 shows as an example, the insole and the pad, the insole being provided with suitable reference lines 16 for indicating it on the chart, the outline of the foot having, however, been omitted for the sake of clearness. It will be evident, however, that the position of the pad can be readily determined and expressed with respect to the insole, by means of coordinates common to both the reference lines on the pad and their relative location to the lines on the chart which reference location becomes essential when correction of pad position is desired, and the information must be communicated by correspondence. For instance, the insole, size #7 is shown placed on the chart with the center line 16 on *d*, Figure 11, between  $\frac{1}{2}$  and  $9\frac{1}{2}$ ; pad apex on *d* and 7, line 11 on *c* and *e*. This information is close enough for preliminary location, the final correction being made by directly placing the insole with pad in the position named under the foot.

Figures 12 and 13 show a novel means for attaching the arch support to the shoe. This means comprises a sheet 18 of any suitable material having a tongue 19 struck therefrom, the rim having applied to its lower face, any suitable cement. The piece 2 is provided with a transverse slit 17, adapted to receive the tongue 19. With this construction, the sheet 18 is secured to the insole at the heel, and when so secured, holds the arch support in position in the shoe. It will be noted that the insole is not retained merely at a single point, but as shown in Figures 12 and 13, the locking of the insole in position is on a line across the insole, so that the insole is secured by detachable means against shifting.

It is obvious that various changes may be made in the details without departing from the spirit of this invention. It is, therefore, to be understood that this invention is not to be limited to the specific construction shown and described.

Having thus described the invention, what is claimed is:

1. An arch support, comprising, an inner sole having an unrestricted pad-receiving surface, a pad adapted for unrestricted, universal adjustment over said surface, and lacing means adapted to secure said pad against shifting.

2. An arch support, comprising, an inner sole having an unrestricted pad-receiving surface, a pad adapted for unrestricted, universal adjustment over said surface, and means on said inner sole and arranged along the periphery of said pad, adapted to anchor said pad against movement on said inner sole.

3. An arch support, comprising, an inner sole embodying connected pieces constructed and arranged to provide an unrestricted pad-receiving socket, and a pad adapted for unrestricted, universal adjustment in said pocket

but retained in adjusted position therein, one of said pieces being perforated to receive securing means, substantially as and for the purpose set forth.

4. In an arch support, a pad comprising, an envelope having an impregnated viscid filling adapting the pad to conform to the shape of the foot.

5. In an arch support, a pad, comprising, an envelope, and a filling therein having a body of granular material and a viscid substance.

6. In an arch support, a pad adapted to become plastic by the action of the foot and adapted to retain the impression of the foot.

7. In an arch support, a pad adapted to become plastic by the action of the heat at body temperature and adapted to become hard when cold.

8. In an arch support, a pad having a filling of a fibrous material and a viscid substance.

In testimony whereof I affix my signature this second day of June, 1917.

LUDWIG GUTMANN.