F. S. LEWIS.

ARCH SUPPORT.

APPLICATION FILED APR. 30, 1918.

1,301,579. Patented Apr. 22, 1919.

Fig. 1.

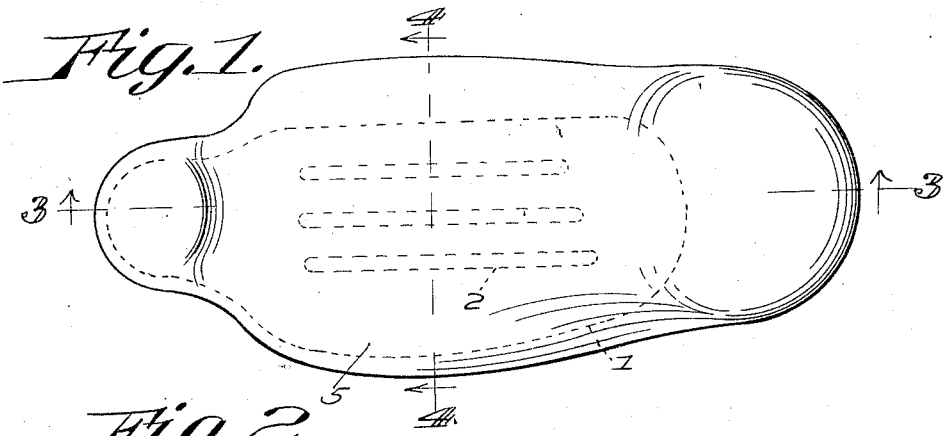


Fig. 2.



Fig. 3.

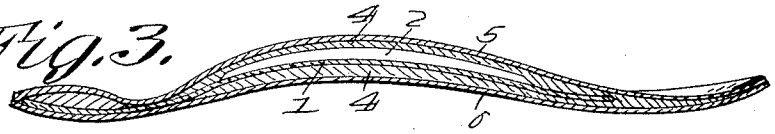


Fig. 4.

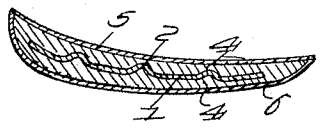
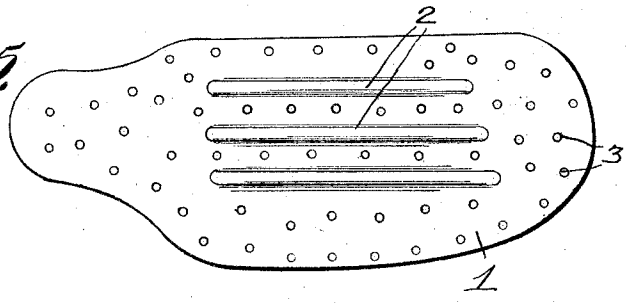


Fig. 5.



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ARCH-SUPPORT.

1,301,579. Specification of Letters Patent. Patented Apr. 22, 1919.

Application filed April 30, 1918. Serial No. 231,676.

To all whom it may concern:

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

The purpose of the invention is to provide an arch support which is relatively light in weight and yet durable and effective in use, maintaining its shape indefinitely.

A further purpose is the provision of an arch support reinforced by a corrugated metal sustaining member, the latter receiving a cementitious material in which it is embedded, thus providing for the forming of an arch support to conform to the shape of a plaster cast taken of the foot with which the support is to be used.

A still further purpose is to provide a metal sustainer having means for effectively receiving and holding the cementitious material in which it is embedded.

Still further and other purposes appear in the following detailed description.

To the exact construction in which it is shown and described, the invention is not to be restricted. The right is reserved to make such changes or alterations as continued use in practice may suggest, in so far as such changes or alterations may be comprehended in spirit by the subjoined claims.

In the drawings:

Figure 1 is a plan view of the invention,

Fig. 2 is a side elevation,

Fig. 3 is a longitudinal sectional view,

Fig. 4 is a transverse sectional view,

Fig. 5 is a plan view of the metal reinforcing plate.

Referring to the drawings, the primary element of the invention comprises the metal sustaining plate 1 which is made preferably of galvanized iron. Aluminum or like metal of strong resisting power may also be used for the purpose of making this plate. The plate is shaped preferably while cold to fit the plantar or longitudinal arch of the foot. In order to increase its rigidity, the plate is provided with two or more corrugations 2, the deepest of which is formed near that edge of the plate fitting the inside of the arch. The plate adjacent to the edges and between the corrugations is provided with the perforations 3 for the purpose later described.

Molded over the plate, both on the top and bottom faces thereof, there is a cementitious material 4, (constituting a solvent and preferably one of the modified forms of cellulose) this cementitious material filtering through the perforations, so that that on top of the plate is united with that on the bottom of the plate. This cementitious material contains a solvent to permit its easy working when being applied to the plate and to permit its filtering through the perforations therein. This solvent, however, evaporates after the application of the cement and the latter becomes exceedingly hard. The cement is water-proof and capable of standing a high temperature without becoming soft.

The plate and the cementitious composition applied thereto constitute what is called the filler of the support and this filler is covered on the top by a covering 5 preferably leather. On the bottom, the filler is covered with a suitable fabric 6, the latter being drawn around the edges of the filler and cemented on the top thereof, the leather top covering 5 being cemented down on top of the filler and on top of the edges of the fabric which are drawn over the edge of the filler on top.

The arch support is designed for the purpose of providing a device of this kind which can be effectively shaped to the arch of a foot which it is designed to support and the process of such shaping comprises the taking first of a plaster cast of the foot to be fitted. The plate 1 is then shaped by dies or by hammering to the proper conformation of this cast or as near this conformation as possible, allowance, of course, being made for the space to be taken up by the cementitious material both above and below the plate. After the plate has been shaped, the prepared or shaped side of the cast is first covered with a piece of cotton cloth or other suitable fabric which is fastened down at the edges by applying all around the edges a thin layer of cement. This cement is then allowed to cool or evaporate to the constituency of a thin putty whereupon a covering of the same is applied all over the arch sole from the toe to the heel inclusive. This covering is spread from one-sixteenth to one-eighth of an inch in thickness, the thicker portion being in the center of the arch between the toe and the heel. This layer is then permitted to dry; then the center receives another coat, after which the

metal plate 1 is placed in position and pressed into the cement where it is held until the cement adheres to it. The corrugations on the inner side are thus filled up with the evaporated cement. Then the outer or under side of the support is filled up and molded into shape, being left light on the external edges and bellied or built up in the center under the inner longitudinal arch where the greatest sustaining power of the support is required. The form thus produced is then allowed to dry and constitutes what is called "a core". If a lift or heel straightener is required, it is made of leather or other material and attached in place, preferably with cement. If a metatarsal lift is necessary, it is applied in the same way and extended to the proper position to the front of the arch. Both the heel and metatarsal lifts are well known orthopedic expedients and it is unnecessary to show them applied to the present construction of arch supports. It is obvious however that they may be readily applied to this support in the manner described.

The core after finishing is removed from the plaster cast and trimmed, the bottom thereafter being covered with the fabric 6 and the top with the leather covering 5. Prior to affixing this covering, however, the core receives a light coating of cement on the bottom, after which the fabric is stretched over the bottom and around over the top edges of the core. Then the top covering 5 of leather is applied after the application of a light coat of cement on the top of the cast.

In lieu of drawing the fabric 6 over the edges of the support and cementing it down on the top of the support, the fabric may be trimmed off flush with the edges of the support, the leather covering 5, after application to the top of the support also being trimmed off flush with the edges of the support.

It will be observed that the peculiar construction herein shown provides for a metal reinforcing plate having longitudinal corrugations and these longitudinal corrugations besides strengthening the plate providing for securing the cementitious material in place inasmuch as the corrugations resist any force tending to move such material—either above or below the plate—laterally across the same. The corrugations, therefore, act as an additional securing means for the cementitious material by serving to offset strains that the material itself could not resist solely through the agency of that part of the material passing through the perforations and uniting the two sections of the material carried above and below the plate.

The leather and fabric covering employed also assist in maintaining the cementitious material against the plate and thus serves a useful purpose other than that of providing a finish for the support.

The invention having been described, what is claimed as new and useful is:

1. An arch support comprising a metal plate having longitudinal corrugations and provided with a plurality of uniformly spaced perforations, a cementitious compound applied on either side of the plate and secured in place thereon by the perforations through which it filters, the said compound being of a character to permit its drying, and forming a solid mass, whereby a core is formed, and top and bottom coverings adhesively secured to the core.

2. An arch support comprising a metal plate formed with longitudinal corrugations and provided with a plurality of perforations and a cementitious compound applied to the plate on opposite sides thereof, the compound embedding itself in and between the corrugations on the two sides of the plate and uniting through the perforations in the plate for the useful purpose herein specified.

3. An arch support comprising a sustaining member formed with corrugations, and a cementitious compound applied on opposite sides of the said sustaining member, the compound being embedded in and between the corrugations on the two sides, the sustaining member having openings formed therein through which the compound on the two sides unite, whereby the said compound is effectively secured to the said support in the manner herein specified.

4. An arch support comprising a reinforcing member formed with corrugations, a cementitious compound applied to the reinforcing member on opposite sides thereof, the said compound being embedded in and between the corrugations on the two sides, the reinforcing member being formed with openings through which the compound on the two sides unite, and a flexible covering adhesively secured on the outer face of the compound on each side.

In testimony whereof I affix my signature.

FRANK S. LEWIS.

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