June 23, 1931. E. FREI 1,811,787

FOOT ARCH SUPPORT

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Fig. 1.

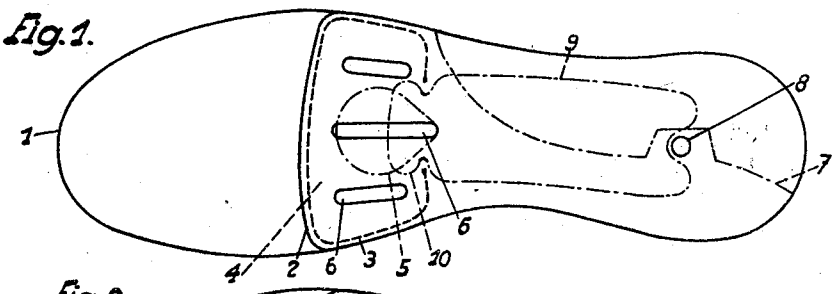


Fig. 2.

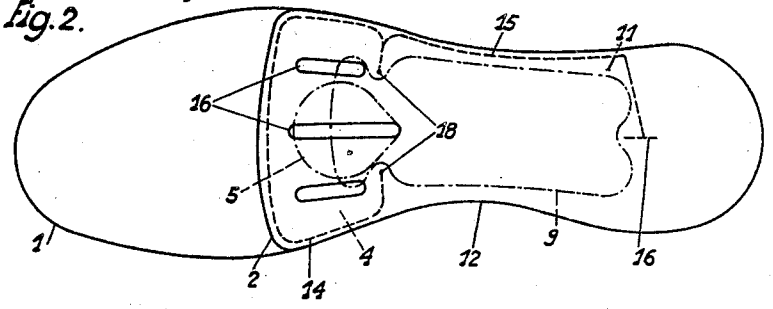


Fig. 1a.

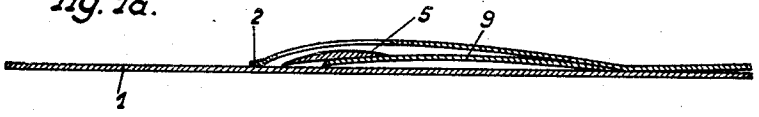


Fig. 3.

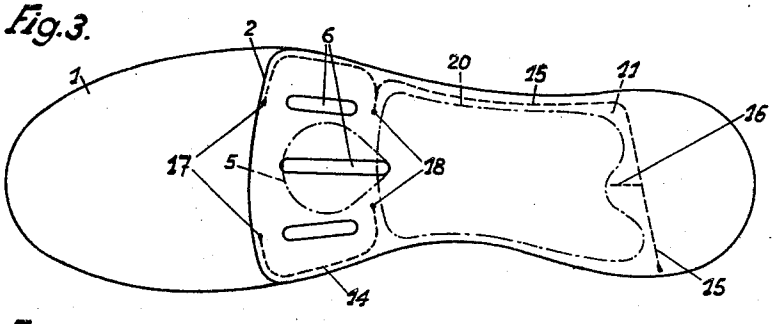
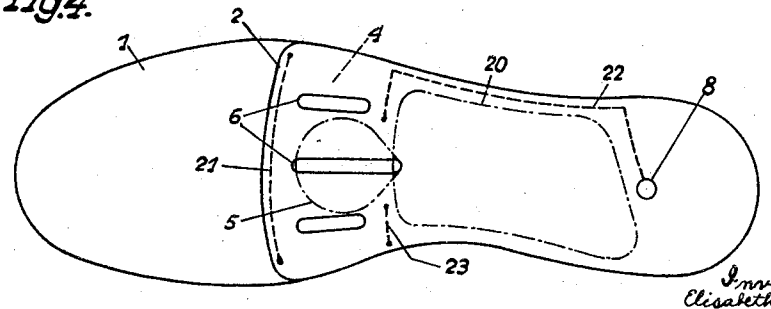


Fig. 4.



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Fig. 5.

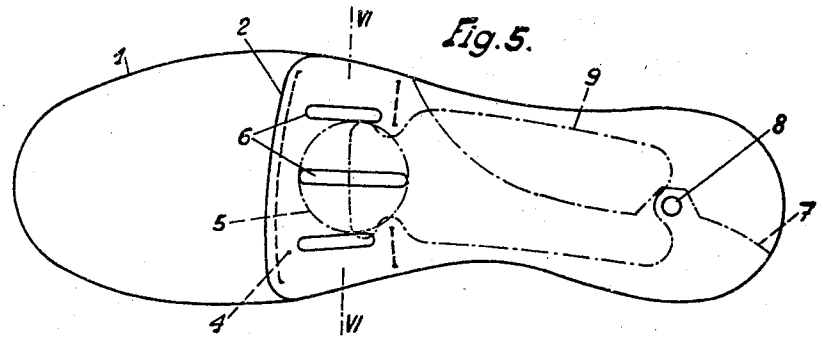


Fig. 7

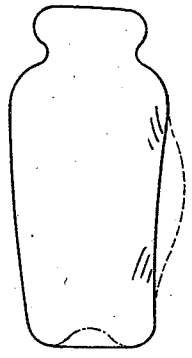


Fig. 10.

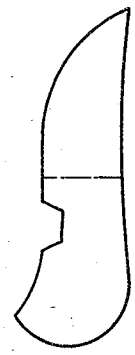


Fig. 8.

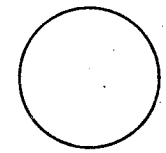


Fig. 9.



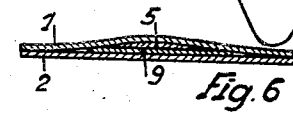
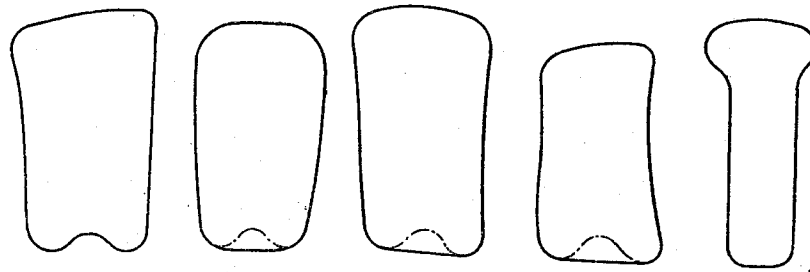


Fig. 6

Fig. 11.



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UNITED STATES PATENT OFFICE

ELISABETH FREI, OF ZURICH, SWITZERLAND

FOOT ARCH SUPPORT

Application filed January 27, 1930, Serial No. 423,821, and in France January 28, 1929.

This invention relates to improvements in arch supporters of the type adapted to be inserted in a boot or shoe and serve as a support for the foot.

The object of the invention is to provide a longitudinal foot arch supporting device which may readily be constructed in a simple and efficient manner of material that can be easily cut, bent and united and comprising a series of packing members housed in separate pockets and adapted to be assembled together in direct contact with each other in different combinations and in different positions relatively to one another and to the device as a whole so that the manufacturer or the user can easily modify the shape and dimensions of the arch. The packing members according to the invention may be variously constituted and may be associated with retaining means such that they can be altered in position. Or the packing members may be adapted to be clamped together in any position in which they may be assembled; or the packing members may be so formed or provided with means that after being assembled one upon another in required position they are automatically locked against lateral movement until purposely separated.

A further object of the invention is to provide a leather body structure and adjusting pads such that the device may be readily and accurately adjusted to suit the requirements of the wearer, and such that all parts will be simple, inexpensive, and easily made and assembled.

The invention consists in upper and lower members connected to form one or more pockets, there being a plurality of superimposed pads to fit in said pocket, and means engaging said pads, and one of said members for joining said pads detachably to form a filling member adjustable to variable thickness by addition or removal of pads and to retain the pads in their correct position.

A still further object of the invention is the provision of an insole extending over the whole length of the foot from the bearing part of the heel to the toes, which insole while firmly supporting the instep arch the metatarsal arch or any portion of the foot retains full flexibility and allows the free and natural movement of the foot when walking.

While the invention will be described in detail in particular application to an all-flexible insole, it will be apparent that some of its features may be employed in other arch supports; that in its broader aspects it is not limited to the specific materials referred to; and that embodiments of the invention may be made, within the scope of the appended claims, in many and varied forms of detail.

In the accompanying drawings several preferred modes of construction are shown by way of examples.

In the drawings,

Figs. 1 to 5 show five flexible insole-supports embodying the invention each being in a plan view,

Fig. 1*a* is a sectional view taken longitudinally of the device shown in Fig. 1,

Fig. 6 is a cross section on line VI—VI of Fig. 5.

Figs. 7 to 11 are detail views of different detachable fillers or pads.

As shown in Figs. 1 and 1*a* my improved device comprises a sole 1 extending approximately over the entire length and breadth of the foot and a cover piece 2. The sole 1 consists of soft flexible leather, canvas or similar material shaped to conform to the shape of a shoe. The cover piece 2 consisting of soft and flexible material such as leather, canvas etc. conforms in shape to the sole, but is shorter and extends from the heel to the roots of the toes. Both parts 1, 2 are stitched together as at 3 leaving a pocket 4 therebetween adapted to receive pads 5, which may be inserted through slots 6 provided in the cover piece 2. Besides the pad 5 shown in Fig. 1 other pads may be inserted which preferably overlap each other. The hind portion of the sole is open marginally to permit the parts 1, 2 to be spread apart for the insertion of intervening fillers 7. At the heel at 8 the two parts 1 and 2 are united by a rivet. Between the two parts 1, 2 an insert 9 of stiff material, for instance of pressed leather, metal, celluloid or any other suitable material is arranged, which insert abuts on said rivet with one end and its front end 10 projects into the

pocket 4, overlapping with its front end the pad 5. The insert 9 is retained in position by the ends of the course of run of stitching 3 and by the said rivet 8 which passes through a notch of said insert 9. The latter is shaped to conform to the shape of the arch of the foot to be supported. The fillers 7 are removably and adjustably held by the said rivet 8 and by the parts 1, 2 exerting a clamping action on said fillers. The fillers may be made of any suitable material hard or soft such as leather, rubber, metal or artificial material. Several fillers may be superimposed to give the desired elevation to the cover piece and the desired degree of support at any part of the area under the cover 2 from the heel to the toes. There is no one part which cannot be supported in the desired degree.

In Fig. 2 a slightly modified construction is shown. The body of the device comprises upper and lower members 1, 2 made of soft leather, canvas etc. constituting respectively a cover piece 2 and a base 1, these being connected permanently together in such a manner as to form effective pockets 4 and 11. The pocket 11 is open marginally at 12 to permit the insertion of the bridging piece 9 of metal or any suitable other material. The base 1 is shaped to conform to the inside of a shoe so as to approximately fill the heel and shank portion thereof and extend to the toes. The cover 2 extends to the metatarsals. The connection between the parts 1, 2 is effected by stitching 14 such stitching following two courses 14, 15 to unite not only the parts 1, 2 but to form the two pockets 4 and 11. The pocket 4 opens at 18 towards the pocket 11, for the reception of the head of the insert 9 inserted in the pocket 11 which opens marginally. The course of run of stitching 15 follows the outer edge of the parts 1, 2 and extends to the middle of the heel portion where stitches 16 not only unite the parts 1, 2 but form an abutment for the insert 9. The cover 2 at the pocket 4 is provided with slits 6 to allow the pads to be inserted. Only one pad is shown in Figs. 1 and 2 but any number may be inserted as required. Moreover more than one insert may be inserted in the pocket 11 the inserts may be superimposed and fastened together or to one of the parts 1, 2. The parts 1, 2 may be spread apart at the heel portion for the insertion of fillers at any desired point.

The form of construction illustrated in Fig. 3 differs from that shown in Fig. 2 in that the pocket 4 is provided with a second opening 17 opposite the opening 18 said opening affording access to pocket 4 and facilitating the insertion of a plurality of pads 5, only one of which is shown. The insert 20 is shorter than insert 9 of Figs. 1 and 2 and is not provided with the described head portion engaging the pocket 4 (Figs. 1, 2). The shortened insert 20 extends however below the centre pad 5. The stitching 15 running across the parts 1, 2 extends from one side edge to the other and restricts the opening of pocket 11.

The device shown in Fig. 4 includes a pocket 4 open at the opposite lateral sides, the stitching running as denoted by the lines 21, 22, 23. A rivet 8 is provided to unite the parts 1, 2.

Figs. 5 and 6 show a support similar to that shown in Fig. 1, but having the pocket 4 open at its two opposite lateral sides.

Figs. 7 to 11 show inserts, fillers or pads of different shapes. The said parts which are used singly or combined may consist of hard, semi-hard, flexible or of pliable material such as metal, wood, bone, fibre, leather, celluloid, rubber, felt or any suitable artificial material. If hard material is used for the inserts the edges may be covered by suitable material to prevent excessive wear or the wearing-off of the parts 1 or 2, by the edges of the inserts. The inserts may be initially pressed or equivalently treated to produce a bulge which approximates the shape of the arch to be supported.

In all the different types shown and described the means of adjustably supporting the foot arch are readily removable and any adjustment may be rapidly done by the wearer himself. The resiliency and the flexibility of the insole may be made to suit the requirement.

In all the types described above wherever metallic insets are used the edges thereof may be covered with a thin layer of any suitable material, so-called vulcanized fibre, vulcanite, rubber etc.

It is obviously advantageous that an instep arch support be readily adjustable to the foot of the individual user and this desideratum is subserved by the construction described. Manifestly the fillers and insets may be readily detached from the position in use and may be easily formed to the desirable curvature to fit the highest part of the instep arch. When proper adjustment is made the insert may be readily slipped back into its pocket, and is retained against accidental displacement by the positioning means described. If desired the parts 1 and 2 may be sold in conjunction with a plurality of differently arched auxiliary fillers, so that the user may select the auxiliary plate of conformation best suited to his feet.

While I have herein described several embodiments of the invention it will be apparent to those skilled in the art that changes may be made in the details thereof without departure from the spirit of the invention, as defined in the appended claims.

What I wish to secure by U. S. Letters Patent is:

1. A foot arch support comprising a lower part adapted to cover the whole foot area, an

upper part adapted to cover the whole area of the foot from the heel to the metatarsal bones, stitching uniting the said two parts to form three pockets, a transverse pocket adapted to accommodate pads to support the metatarsal bones, a second pocket adapted to receive a longitudinal arch supporting insert and a heel pocket to accommodate cushioning pads, the said insert projecting into said transverse pocket.

2. In a foot arch support as defined in claim 1 at least one pocket extending from the heel to the toes and over the whole breadth.

3. In a foot arch support as defined in claim 1 a plurality of packing pieces spread over the whole area to be supported and overlapping each other, said plurality of pieces forming a flexible composite body of variable size and shape.

In testimony whereof I affix my signature.

ELISABETH FREI.