W. M. SCHOLL.

INSTEP ARCH SUPPORT.

APPLICATION FILED APR. 25, 1914.

1,146,597. Patented July 13, 1915.

Fig. 1

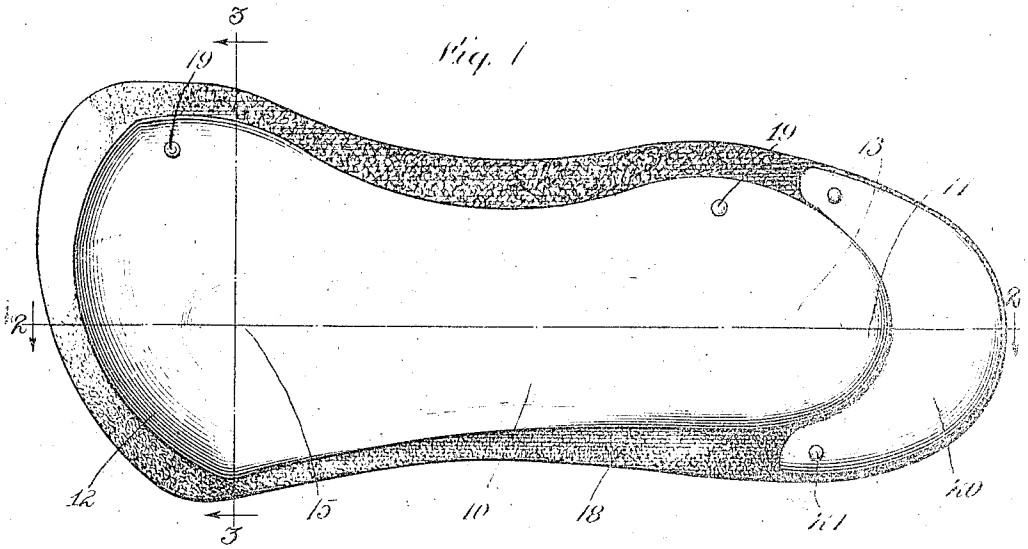


Fig. 2

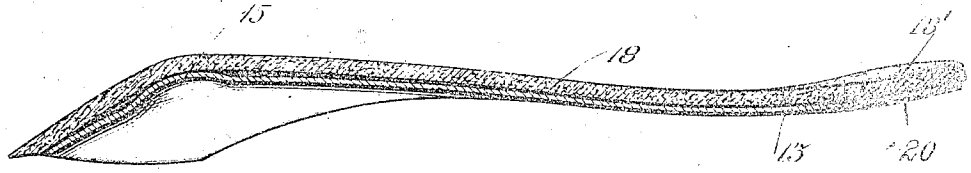


Fig. 3.



Witnesses:

Robert H. Weir

Arthur W. Carboy

William M. Scholl.

by Foree Bain & Foree

Attorneys

UNITED STATES PATENT OFFICE.

WILLIAM M. SCHOLL, OF CHICAGO, ILLINOIS.

INSTEP-ARCH SUPPORT.

1,146,597. Specification of Letters Patent. Patented July 13, 1915.

Application filed April 25, 1914. Serial No. 834,440.

To all whom it may concern:

Be it known that I, WILLIAM M. SCHOLL, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Instep-Arch Supports; of which the following is a specification.

My invention relates to improvements in instep arch supports and in some of its features more particularly to arch supports operating to elevate the transverse arch of the metatarsal bones for correction of "Morton's toe", or the result of a breaking down of such transverse arch.

In most arch supports that involve a metal supporting element, made of one or more parts, and a leather cover piece, the metallic support does not extend clear to the heel extremity of the cover piece. There are many apparent reasons for this shortening of the metallic supports, of which one of the most obvious is that in different shoes there is such variation in the angular relation of the inner surfaces of the shank and heel of the shoe as to make shaping of the metallic plate structure to conform to such variations a matter of difficulty.

One of the objects of my invention is to provide an improved structure wherein the metallic elements extend flexibly clear to the rear end of the cover piece, for purposes described; and in general to provide an arch support, particularly adapted for the correction of a broken transverse arch of the metatarsal bones.

In the drawings Figure 1 is a bottom plan view of an arch support embodying my invention; Fig. 2 is a longitudinal section on line 2—2 of Fig. 1; Fig. 3 is a transverse section on line 3—3 of Fig. 1.

In the particular embodiment of my invention shown I have illustrated the metallic main element 10 as a single plate, which, generically speaking, is one well known form of metallic supporting element. It will be apparent, however, that some of the features of my present invention may be applied to other forms of arch supporting elements without departure from the spirit of my invention and within the scope of the appended claims.

The plate 10, as herein shown is of a length to extend from a rear bearing point 11, which preferably lies about centrally beneath the heel of the wearer's foot, forward to a point approximately alining with the heads of the metatarsal bones, and affording relatively wide front bearing at its end 12. The arch plate 10 is longitudinally curved to span the shank of the shoe and receive bearing only at its ends. The rear end 11 is preferably curved substantially in semi-circle, and is preferably dished as at 13 in approximate conformity with the under curvature of the heel. The front end 12 is preferably curved on a line substantially conforming with the line of the foot defined by the heads of the metatarsal bones. In the particular construction shown the supporting function of the plate is affected mainly adjacent to its front end. In addition to the general curvatures of the plate that give it substantial conformity to the contiguous portions of the foot, a hump or node 15 is provided, located to underlie the metatarsal bones of the foot between the first and fifth, and in the particular construction shown such hump or node is made in the single plate 10. Such supplemental hump, 15, pressing against the flesh and ligaments of the foot and transmitting its pressure to the metatarsal bones, tends to raise the center of the transverse arch of the foot, restoring the foot to its normal condition in which the weight of the person is carried substantially on a tripod bearing afforded by the os calsis and the first and fifth metatarsal bones. The action of such hump elevates the intermediate metatarsals, or such thereof as it underlies, and through its action on the ligaments tends to draw down or inward somewhat the first and fifth metatarsals, thereby so to position the bones that pressure, in walking, is not applied to the heads of the second, third and fourth metatarsal bones, and so that the pain caused by the breaking down of the transverse arch is obviated.

It will be apparent that any form of arch support involving the supplemental hump support of the transverse arch must be accurately positioned in the shoe for proper effect. If the hump is too far back, its effect is seriously decreased and adequate support is not given to the affected bones and ligaments. Furthermore, it will be manifest that such auxiliary hump construction gives to the arch support a special tendency to creep rearwardly in the shoe on account of the sharp inclination of the front end of the hump 15.

In the arch support shown, as is common in most arch supports, a leather cover piece 18 secured to the plate by means of rivets 19 is provided, shaped to interfit with the bottom surface of the shoe from the heel to the ball thereof, and having its front end skived for comfort. The rear end of such cover piece is customarily relied upon for positioning the arch support lengthwise of the shoe; but in practice it is found that the leather is apt to soften under the heat and moisture of the foot and the arch support structure is liable to creep rearwardly, buckling the leather under the heel, causing the leather either to curl up in the back of the shoe or to form ridges under the heel of the wearer; and in any event, detracting from the usefulness of the appliance and causing great discomfort to its wearer.

In the practice of my invention I apply to the extension 18′ of the leather cover piece which projects in rear of the main plate 10, a metallic positioning plate 20, secured to the leather cover piece, independent of and flexibly movable with respect to the metallic arch supporting member 10, said heel plate 20 extending from a rearmost point substantially conforming with the rear extremity of the cover piece to a point or points of contact with the rear end of the main arch plate. Part 20 thus forms a positioning brace, as it were, between the heel counter of the shoe and the main arch plate 10, but without detracting from the ability of said main arch supporting structure to take the position in the shoe that is required by the relative curvatures of the shank and heel seat.

The plate 20 in the specific construction shown, is preferably made of aluminum or other light metal substantially of the same thickness as the contiguous plate portion of the main arch supporting element, and dished for conformity with the heel of the wearer. It is preferably shaped for substantial conformity throughout its edge with the end curvatures of the leather cover piece 18 so that it may conform approximately to the curve of the shoe counter and at its forward edge it is curved in substantial conformity with the rear end 11 of the plate 10. The plate 20 thus takes a crescent shape having a chord from tip to tip greater than the width of the heel part of the main arch plate. Rivets 21, preferably located in the tips of the crescent, secure the plate 20 to the leather cover piece 18 independently of the main arch plate 10, the flexibility of the leather of course permitting the heel plate 20 to lie on the heel seat whatever position the main plate 10 may take in effecting its two point bearing at its opposite ends, spanning the shank of the shoe. Also it will be observed that in practice the two portions of the metallic structure afford substantially uniform bearing to the whole heel of the foot, so that no uncomfortable "break" in the leather occurs. The rear bearing afforded by plate 20 prevents the hump 15 from shifting rearwardly, and the dished heel socket provided jointly by the portions 13—20 of the structure tends to prevent displacement of the foot with respect to the structure.

While I have herein described in some detail a particular embodiment of my invention it will be apparent to those skilled in the art that changes in the details thereof might be made without departure from my invention.

Having described my invention what I claim is:—

1. In an arch support, a leather cover piece arranged to interfit in a shoe and to extend from the rear extremity of the shoe to in front of the shank thereof, a main arch structure secured to said cover plate, arranged to underlie the shank of a human instep and terminating at its rear end in front of the rear extremity of the cover piece, and a metallic heel plate attached to said cover piece independently of said main element, and extending from a point of contact with the rear end of said main element to substantially the rear e tremity of the cover piece.

2. In an arch support the combination of a leather cover piece arranged to fit snugly in the shank and heel of a shoe and to extend forward to substantially the ball there of, a metallic arch supporting structure secured to said cover piece, having general surface curvatures to span from the heel of the wearer to about the lines of the heads of the metatarsal bones and having at its front portion a hump above said general curvature for affording support to the metatarsal bones, to correct "Morton's toe" and a metallic heel plate, separate from the main arch supporting structure secured to said cover piece and extending from a point of contact with the main arch supporting element to substantially the heel extremity of the cover piece, for positioning the main structure against displacement rearwardly.

3. In a device of the character described, the combination of a leather cover piece, an arch support element having a curved rear end 11, and a front hump 15, and a crescent shape heel plate 20 secured to said cover piece at the ends of the crescent and extending from said curved end of the main arch support to substantially the rear extremity of the cover piece, said plate 20 and the rear end of the arch-support element having jointly a dished heel-socket.

4. In an arch support, a leather cover piece arranged to interfit in a shoe and to extend from the rear extremity of the shoe to in front of the shank thereof, a main arch

structure secured to said cover plate, arranged to underlie the shank of the human instep and terminating at its rear end in front of the rear extremity of the cover piece, the rear end of the main arched structure being curved, and a crescent shaped heel plate secured to said cover piece at the ends of the crescent and extending from said curved end of the main arch structure to substantially the rear extremity of the cover piece.

In testimony whereof I hereunto set my hand in the presence of two subscribing witnesses.

WILLIAM M. SCHOLL

In the presence of—
GEO. T. MAY, Jr.,
MARY F. ALLEN.