May 3, 1949. O. M. PICK ET AL 2,468,944

SHOE CONSTRUCTION

Filed Sept. 8, 1947

Fig. 1

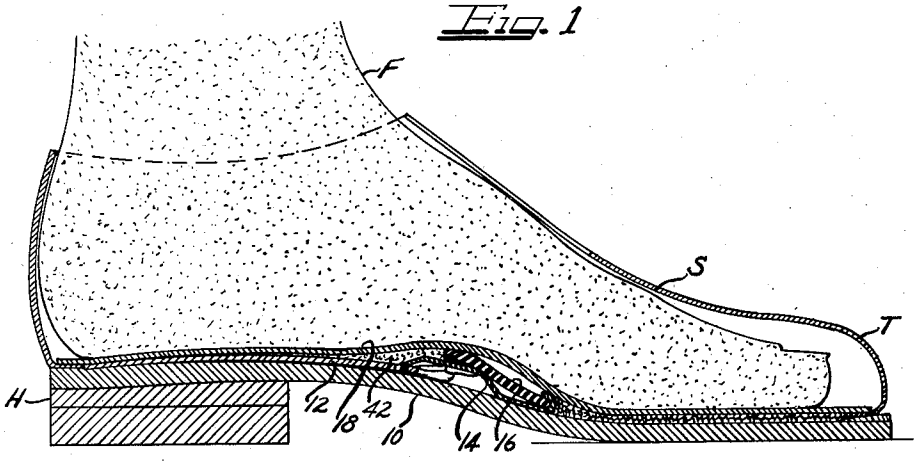


Fig. 2

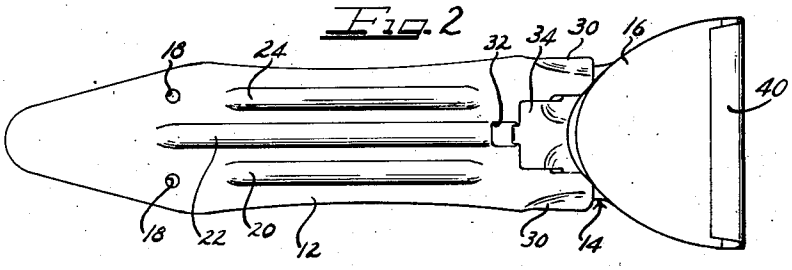


Fig. 3

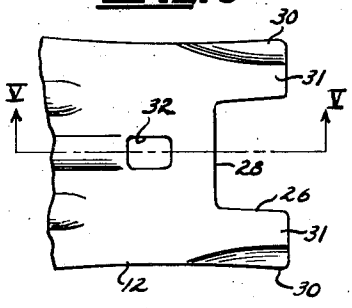


Fig. 4

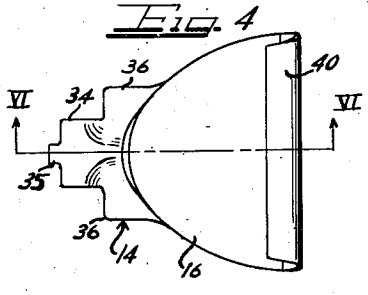


Fig. 5

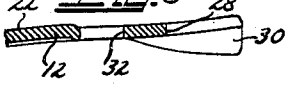
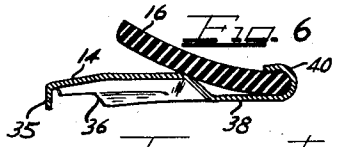


Fig. 6



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SHOE CONSTRUCTION

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9 Claims. (Cl. 36—76)

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Our invention relates to a shoe construction and more particularly to an improved arch supporting device for curing foot ailments including prevention and correction of a large number of various disabilities and weaknesses commonly referred to as fallen arches.

In one method of prevention and cure of fallen arches, an upwardly extending dome is placed at the bottom of the shoe in a position centrally located in the longitudinal and transverse directions relative to the metatarsal arch of the wearer. When the heel is placed upon the ground the device affords the navicular bone, the first, second and third cuneiform and cuboid bones a considerable measure of support by cantilever action. When the weight is transferred toward the front part of the foot, the toe is brought into supporting relation with the ground at which time both the tarsus and the metatarsus are supported by beam action, the primary support from the arch being through the dome.

In accordance with the present invention an improved arch support structure for providing this action is achieved by use of a lengthy plate extending along the bottom of the shoe from the heel to a point where the dome is desired. This plate is provided with a centrally disposed notch at the forward edge thereof together with an opening near the foot of the notch to receive a cooperating support member. The support member is provided with a backwardly extending tongue to be received in the notch and a downwardly extending tongue to enter the opening and fix the position of the support member relative to the plate. A cushion of rubber or similar material is pressed underneath the forward edge of the support member which is bent back for the purpose and extends backwardly thereover to form a cushion for the dome over the parts.

It is accordingly a general object of the present invention to provide an improved shoe having an arch support for the prevention and cure of the maladies commonly referred to as fallen arches.

Another object of the present invention is to provide an improved shoe having an arch support for the prevention and cure of the maladies commonly referred to as fallen arches and in which the separate cooperating parts are held in fixed relation relative to each other.

Yet another object of the present invention is to provide an improved shoe having an arch support having a dome for the prevention and cure of fallen arches and in which the dome is provided with a suitable cushion for the support of the wearer with a maximum degree of comfort.

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Still another object of the present invention is to provide an improved arch support that is readily assembled to provide resistance to downward flexure but which is free to execute limited upward flexural movements and has no tendency to make noise during walking.

Our invention further resides in features of construction, combination and arrangement whereby a comfortable, inexpensive, dome type arch support having a maximum degree of simplicity is provided.

The novel features which we believe to be characteristic of our invention are recited with particularity in the appended claims. Our invention itself, however, both as to its organization and method of operation will best be understood from the following description taken in connection with the accompanying drawings.

On the drawings:

Figure 1 is a phantom view showing a shoe equipped with the structure of the present invention and showing that structure in axial cross section;

Figure 2 is a top plan view of the structure of the present invention;

Figure 3 is an enlarged view of the end portion of the plate portion of the present invention showing the notch and opening provided to engage cooperating parts of the support member;

Figure 4 is a top plan view of the support portion of the structure; and

Figures 5 and 6 are cross sectional views through axes 5 and 6, respectively, of Figures 3 and 4.

As shown on the drawings:

Referring to the phantom view of Figure 1, the foot of the wearer is shown at F and the shoe indicated at S. The latter comprises a heel portion H from which the heel of the wearer is supported above the supporting surface and a toe portion T which supports the toe of the wearer at a closer point to the supporting surface. An outsole 10 extends along the bottom of the shoe to form a wearing surface for the bottom thereof.

The plate 12 rests upon the outsole portion 10 of the shoe S and extends from the heel H forwardly to a point centrally located relative to the metatarsal arch of the foot F. A support plate member 14 is located at the forward end of the plate 12 and the cushion 16 rests upon the upper surface of this plate to provide a resilient dome to support the foot of the wearer at a point centrally disposed longitudinally and trans-

versely relative to the metatarsal arch. An insole 18 is located between the plate 12, the cushion 16 and the foot F to provide a neat appearance and to give the wearer further protection against any edges in the plate 12 or the cushion 16.

The general structure of the plate 12 will best be understood by reference to the top plan view of Figure 2. As is evident from this figure, the plate 12 is provided with a plurality of holes 18 to accommodate nails or other devices to attach the plate to the shoe. A plurality of longitudinally extending ribs 20, 22, and 24 are pressed into the plate to provide added rigidity in the horizontal direction. At the front end, the plate 12 is notched as shown in Figure 3, the notch being of generally square shape as indicated at 26 with bottom portion 28. Turned down edge portions 30 of plate 12 are positioned in alignment with the notch and form a support for the two side tongues formed thereby. The structure of these portions will further be evident from the side view of Figure 5.

In addition to the foregoing elements, the plate 12 is provided with a rectangular opening 32 centrally disposed relative to the axis thereof at a point close to the bottom 28 of notch 26. This opening receives a corresponding downwardly extending tongue in member 14 to prevent shift of the latter.

The structure of the support member 14 is best seen in the top plan view of Figure 2 which shows it in cooperating relationship with the plate 12 and the top and cross sectional views of Figures 4 and 6 which show this member and the cushion 16. As will be evident from these figures, the member 14 is provided with a rearwardly extending tongue 34 of transverse dimension slightly less than that of the notch 26 to be received therein as indicated in Figure 2. As will be apparent from the cross sectional view of Figure 6, this tongue is of substantially flat shape and has at its rear end a downwardly extending tongue 35, this latter tongue being of lateral dimension to fit in the opening 32 provided in the forward end of the plate 12.

The support member 14 is further provided with two depressed portions 36 adjacent the root of tongue 34 and which lie underneath and inside the turned down edge portions 30 at the forward end of the plate 12, thus providing support for member 14 against downward flexure relative to plate 12.

On its forward end, the support member 14 comes down to a flat portion 38, Figure 6, which is bent back upon itself in the upward direction to wrap around the forward edge of the cushion 16 as indicated at 40. This portion is pressed down tightly over the cushion 16 to hold that cushion securely relative to the other portions of the mechanism.

The cushion 16 is of resiliently deformable material such as rubber composition to rest over member 14 and forms a dome with the desired degree of resistance to flexure. It is of generally semi-circular shape with the forward edge shaped to be gripped by the forward edge 40 of member 14 and extending backwardly over the member 14. Preferably the cushion 16 is of relatively soft resilient material, such as soft rubber, although harder materials such as relatively harder rubber may be used if less resilience is desired.

In the assembled position the support member 14 is located with its tongue portion 34 extending backwardly into the notch 26 of plate 12 and with its edge portions 36 passing underneath the edge portions 30 of the plate 12 as shown in Figure 2. The downwardly extending tongue 35 is dropped into the opening 32 of the plate 12, thereby forming a tongue and opening connection which holds member 14 in fixed position relative to the plate 12 and opposes relative shifting thereof. The plate 12 is then fastened to the sole 10 by driving nails through openings 18 or similar means, the entire unit covered with cement (42, Figure 1) and the insole 18 attached. The cushion 16 then extends upwardly over the support member 14 to form the resiliently deformable dome directly under the metatarsal arch of the wearer.

The downwardly extending tongue 35 and the backwardly extending tongue 34 of member 14 fix the position of that member against shifting relative to the plate 12. Member 14 and plate 12 further oppose downward flexure because of the engagements between the overhanging edges of tongue 34 and the portions of plate 12 immediately thereunder and the engagements between the edges 36 of member 14 and the forwardly extending tongues 31 of plate 12. However, there is no opposition to limited upward flexure of the plate 12 relative to member 14, and thus there is no tendency to create noise as the walking takes place.

While we have shown a particular embodiment of our invention, it will of course be understood that we do not wish to be limited thereto since many modifications both in the elements disclosed and their cooperative structure may be made without departing from the spirit and scope of our invention. We, of course, contemplate by the appended claims to cover all such modifications and alternative constructions as fall within the true spirit and scope of our invention.

What we claim as new and desire to secure by Letters Patent of the United States is:

1. An arch support for a shoe comprising in combination; a lengthy plate to extend from the heel portion of the shoe to a point under the metatarsal arch of the wearer, said plate having a substantially rectangular notch at its forward end and an opening near the bottom of said notch, the tongues formed by said notch being bent down at their edges to form a support for the forward portion of said plate; a support member having a rearwardly extending tongue to fit in said notch and a downwardly extending tongue to be received in said opening, said support member further having depressed portions adjacent the root of said rearwardly extending tongue to fit under said first tongues to resist downward flexure of said plate relative to said member, said member further having a bent over forward edge portion; and a substantially semi-circular cushion member disposed between said bent over forward edge portions and extending over said support member to form a dome to support the metatarsal arch of the wearer.

2. An arch support for a shoe comprising in combination; a lengthy plate to extend from the heel portion of the shoe to a point under the metatarsal arch of the wearer, said plate having a substantially rectangular notch at its forward end and an opening near the bottom of said notch, the tongues formed by said notch being bent down at their edges to form a support for the forward portion of said plate; a support member having a rearwardly extending tongue to fit in said notch and a downwardly extending tongue to be received in said opening, said sup-

port member further having depressed portions adjacent to the root of said rearwardly extending tongue to fit under said first tongues to resist downward flexure of said plate relative to said member.

3. A plate to form an arch support with a support member having a rearwardly extending tongue and a downwardly extending tongue at the end thereof, said plate comprising a lengthy body portion with a substantially rectangular notch at its forward end to receive said rearwardly extending tongue of said support member and an opening near the bottom of said notch to receive said downwardly extending tongue of said support member, the tongues formed by said notch being bent down at their forward ends to provide support for the forward portions of said plate.

4. A plate to form an arch support in connection with a support member having a rearwardly extending tongue and a downwardly extending tongue at the end thereof, said plate comprising a lengthy body portion with a notch at its forward end to receive said rearwardly extending tongue of said support member and an opening near the bottom of said notch to receive said downwardly extending tongue of said support member.

5. A support member to form an arch support with a plate member having a notch at its forward end and an opening close to the bottom of said notch, said member having a rearwardly extending tongue to fit in said notch and a downwardly extending tongue located at the end of said first tongue to be received in said opening.

6. A support member to form an arch support with a plate having a notch at its forward end and an opening close to the bottom of said notch, said member having a rearwardly extending tongue to fit in said notch and depressed portions adjacent the root of said tongue to fit underneath said plate to oppose downward flexure relative thereto, said member further having a downwardly extending tongue located at the end of said first tongue to be received in said opening and to oppose shifting of said member relative to said plate.

7. A support assembly to form an arch support

with a plate of the type having a notch at its forward end and an opening close to the bottom of said notch, said assembly comprising a member with a rearwardly extending tongue to fit in said notch and depressed portions adjacent the root of said tongue to fit underneath said plate to oppose downward flexure relative thereto, said member further having a downwardly extending tongue located at the end of said first tongue to be received in said opening and oppose shifting of said member relative to said plate, said member also having a bent over forward portion, and a substantially semi-circular cushion member disposed between the bent over portions of said forward edge and extending over said support member to form a dome to support the metatarsal arch of the wearer.

8. An arch support having a rigid support plate with a bent over portion along its foward edge and a cushion member of resiliently deformable material disposed beneath said bent over portion and extending backwardly to form a dome to support the metatarsal arch of the wearer.

9. An arch support comprising an elongated flexible plate, a rigid support member hinged to the forward end of said flexible plate, said support member having a rear raised portion and a forward bent-over portion, and a pad of resilient material disposed at the forward end of said support member under said bent-over portion and supported adjacent its rear end on the raised portion of said support member, providing a flexible support for initially absorbing the load transmitted through the metatarsal arch.

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The following references are of record in the file of this patent:

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