Sept. 30, 1947. D. ROLES 2,428,244

FLEXIBLE ARCH SUPPORT

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Fig. 1.

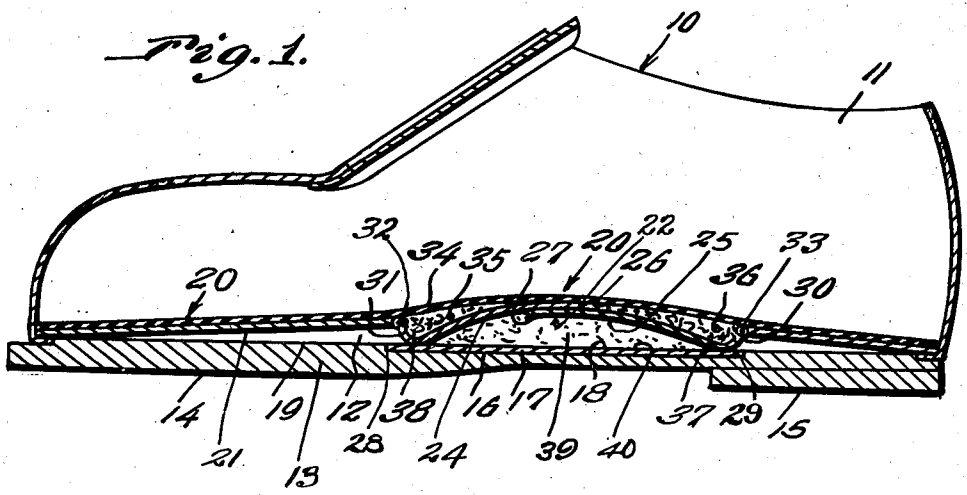


Fig. 2.

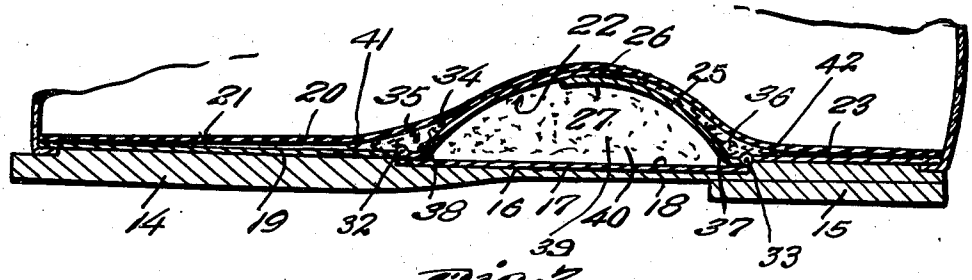
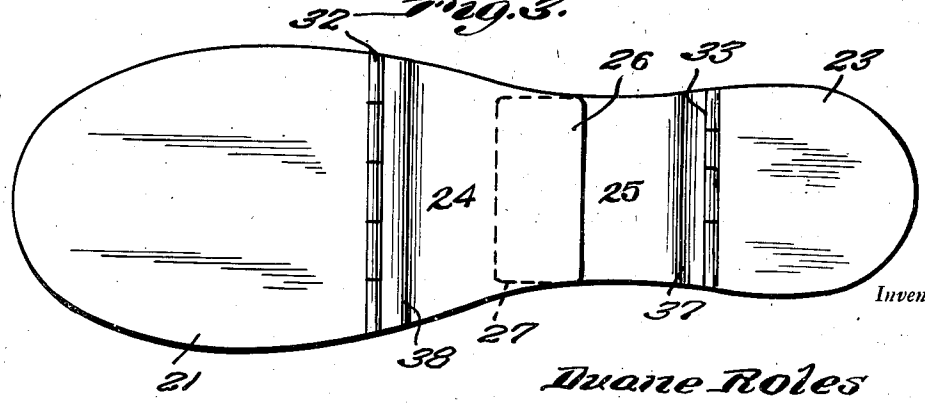


Fig. 3.



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FLEXIBLE ARCH SUPPORT

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15 Claims. (Cl. 36—71)

1

My invention relates to shoes and has for its object to provide a combined flexible sole and arch supporter.

Another object of the invention is to provide an anti-shock foot supporting insole.

Another object of this invention is to provide an arch support formed of a pair of slidably connected plates.

A further object of this invention is to provide a shoe insole formed of a series of hinged connected members.

A still further object of my invention is to provide a lever actuated arch support.

Another object of this invention is to provide in an arch support means for withdrawing the support from the arch of the foot when at rest.

And still another object of my invention is to provide an arch supporting and relieving shoe.

Other features and advantages will become more readily apparent from the following description and the accompanying illustrative drawings in which:

Figure 1 is a longitudinal sectional view of a shoe embracing my invention,

Figure 2 is a similar view broken away and the parts shown in operative position, and

Figure 3 is a detail plan view of an insole arch supporter minus its casing.

In the above drawings as well as in the specification to follow, the same characters of reference indicate the same parts throughout.

While one embodiment of my invention is illustrated in the above referred to drawings, it is to be understood that they are merely for the purpose of illustration and that various changes in construction may be resorted to in the course of manufacture in order that the invention may be utilized to the best advantage according to circumstances which may arise, without in any way departing from the spirit and intention of my device, which is to be limited only in accordance with the appended claims. And while I have stated the primary field of utility of my invention it remains obvious that it may be employed in any other capacity wherein it may be found applicable.

My arch supporting shoe consists of the shoe 11, in which the inner surface 12, of the permanent sole 13, between the tread 14, and the heel 15, is provided with a recess 16, within which is seated a metal plate 17 (or wood or plastic may be used) the upper surface 18, of which is on a common plane 19, of the sole 13.

Seated within the shoe is an insole 20, formed of sections 21, 22 and 23, which together conform to the size and shape of the sole 13. The section 22, of the device is formed of a pair of resilient normally arcuate plates 24 and 25, convexed outwardly and having their free ends 26 and 27, slidably seated upon one another. The outer ends 28 and 29, of these plates are curved upwardly

2

to form levers 30 and 31, the terminal edges of which are hingedly connected as at 32 and 33, to the respective sections 21 and 23. Secured over the entire insole 20, is a taut rubber cover 34, having two primary functions, first to draw down upon the ends 26 and 27, when pressure is relieved from said lever ends 30 and 31, and second to protect the foot of the user from the sliding action of the members 26 and 27. This cover has still another function—that of forming a retainer for the sponge rubber fillers 35 and 36, seated in the respective recesses 37 and 38, formed by the contour of the said plates 24 and 25. A similar cushioning filler 39, is provided in the space 40, under said plates.

From the foregoing it will be seen that the arch of the wearer's foot is firmly but flexibly supported in walking or standing, the arch supporter section 22, acting with every movement of the foot. When members or sections 21 and 23, are pressed down by the weight of the wearer in either walking or standing, the action of the said weight upon members 21 and 23, causes the ends 41 and 42, to pull down upon lever ends 30 and 31, of the plates 24 and 25 to be pressed down at their curved upturned ends 26 and 27, forcing the outer ends of plates 24 and 25, up, causing them to press up the arch of the wearer and upon reverse movement the arch will come down gently upon the section 21, which will give freely and avoid shock to cuboid, schaphoid and internal cuneiform bones of the foot and which would not be the case in using a rigid arch supporter. The means of relieving the instep from pressure of the section 21, when the foot is at rest is a very important function of this invention, which relief is not to be had through the use of any arch supporter I have been able to learn of.

I wish to stress the fact that my device is designed and constructed not only as an arch supporter but primarily to reduce foot shock in walking and to cause the foot muscles to react to the constantly repeated stimulation induced by the co-action of the entire insole of my device.

It is thought that persons skilled in the art to which the invention relates will be able to obtain a clear understanding of the invention after considering the description in connection with the drawings. Therefore, a more lengthy description is regarded as unnecessary.

Changes in shape, size and rearrangement of details and parts such as come within the purview of the invention claimed may be resorted to, in actual practice, if desired.

Having now described my invention that which I claim as new and desire to procure by Letters Patent is:

1. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, each having a lever end adjacent said

hinges, said arch plates being arcuate and resilient, means for depressing said last plates, consisting of a rubber cover for the insole, resilient cushion fillers between the cover and the arch plates and a similar cushion below said arch plates.

2. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, each having a lever end adjacent said hinges, said arch plates being arcuate and resilient, means for depressing said last plates, consisting of a rubber cover for the insole, and resilient cushion fillers between the cover and the arch plates.

3. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, each having a lever end adjacent said hinges, said arch plates being arcuate and resilient, and means for depressing said last plates, consisting of a rubber cover for the insole.

4. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, each having a lever end adjacent said hinges, said arch plates being arcuate and resilient, and means for depressing said last plates.

5. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, each having a lever end adjacent said hinges, and said arch plates being arcuate and resilient.

6. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of plates overlapping at their inner ends, each having a lever end adjacent said hinges, and said arch plates being arcuate.

7. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, said overlapping being substantially at the center of the arch, and each having a lever end adjacent said hinges.

8. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, said support consisting of a pair of overlapping plates, and each having an upturned lever end inwardly of said hinges.

9. An insole comprising a toe plate, an arch support and a heel plate, all hingedly connected, and said support consisting of a pair of upwardly arched overlapping plates one hinged at its front end to the rear of the toe plate and the other hinged at its rear end to the front of the heel plate.

10. An insole comprising a toe plate, an arch support and a heel plate, and all hingedly connected, and said support consisting of a pair of raised concavo-convex overlapping plates having their outer ends curved upwardly adapted to be pressed down in the center and up at their free ends when in use, to press up against the arch of the wearer to support the arch of the foot and to move down when pressure is removed and the arch support raised in the center.

11. An insole comprising a toe plate, an arch support and a heel plate, the arch support being hingedly connected at its outer ends to the inner ends of the toe and heel plates, said support consisting of a pair of plates slidably overlapping at their inner ends, each having an upturned outer end adjacent said hinges and each of said arch plates being arcuate upwardly.

12. An insole comprising a toe plate, an arch support and a heel plate, said support consisting of a pair of upwardly arched plates overlapping at their inner ends transversely of the arch support, one plate being hinged at its front end to the rear of the toe plate and the other hinged at its rear end to the front of the heel plate, a flexible elastic cover over the toe plate, arch support and heel plate to press down on the hinged ends when pressure is relieved from the arch and to move upwardly upon downward pressure on the arch under the weight of the wearer with the foot pressing thereon.

13. An insole comprising a toe plate, an arch support and a heel plate, said support consisting of a pair of upwardly arched plates overlapping at their inner ends transversely of the arch support, one plate being hinged at its front end to the rear of the toe plate and the other hinged at its rear end to the front of the heel plate, a flexible elastic cover over the toe plate, arch support and heel plate the entire inner length of the insole, to press down on the hinged ends when pressure is relieved and soft cushion fillers between the front and rear of the overlapping plates and the cover and under the overlapping plates of the arch support.

14. An insole comprising a toe plate, an arch support and a heel plate, said support consisting of a pair of upwardly arched plates overlapping at their inner ends transversely of the arch support, one plate being hinged at its front end to the rear of the toe plate and the other hinged at its rear end to the front of the heel plate, a flexible elastic cover over the toe plate, arch support and heel plate the entire inner length of the insole, to press down on the hinged ends when pressure is relieved from the arch, and sponge rubber fillers between the front and rear of the overlapping plates and the cover, a flat plate under the arch support adapted to be seated in a recess in a sole at the arch portion thereof between the tread and heel portions thereof.

15. An insole comprising a toe plate, an arch support and a heel plate, said support consisting of a pair of raised convex overlapping plates having their outer ends curved upwardly convex at the bottom and concave at the top, pressed down in the center and up at the free ends thereof when in use to support the arch of the foot of the wearer, a flexible elastic cover over the toe plate, arch support and heel plate, a flat plate under the arch support and on which the upturned ends thereof bear and fulcrum, and soft cushion fillers between the cover and the upturned ends of the arch support plates and between the arch support and the flat plate.

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