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CUBOID SUPPORT AND HEEL RETAINER

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Fig. 1.

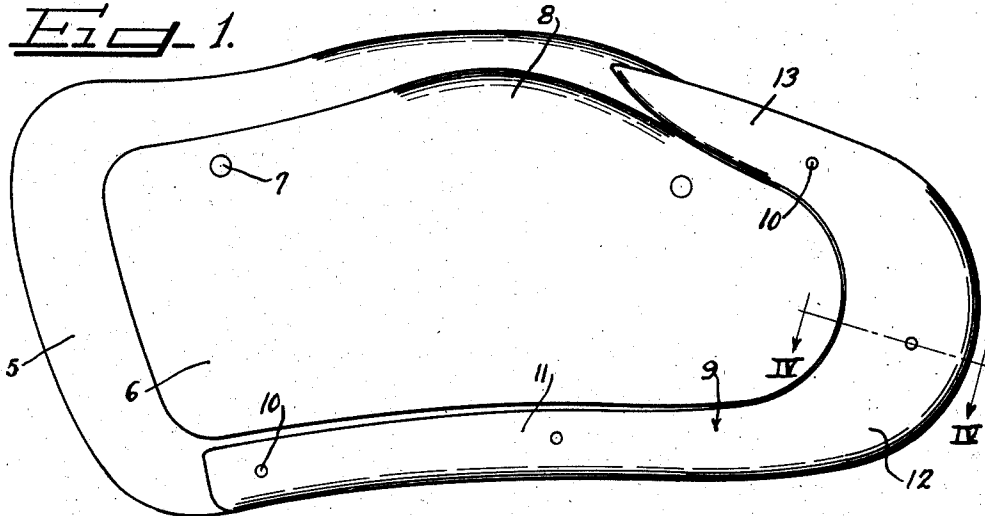


Fig. 2.

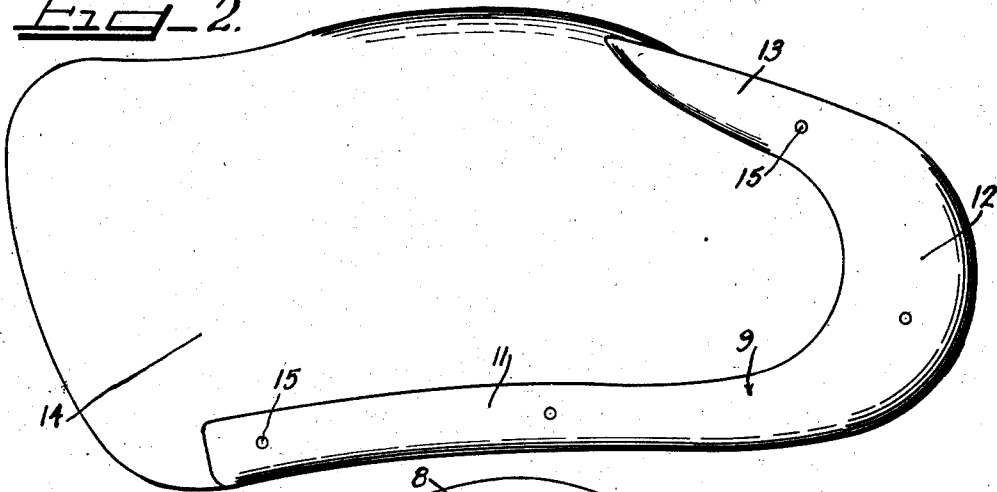


Fig. 3.

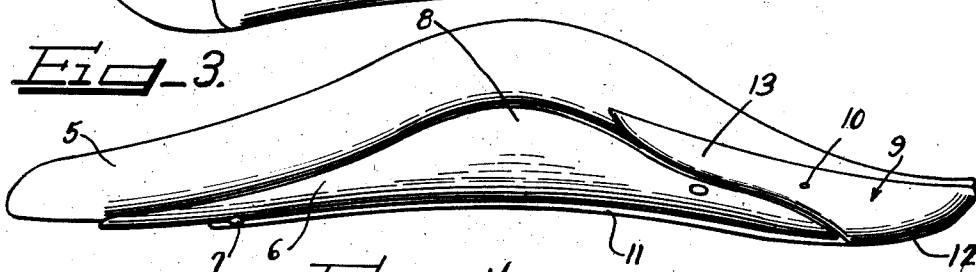
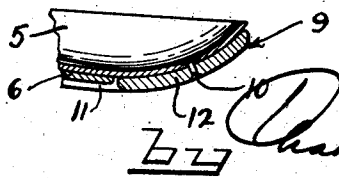


Fig. 4.



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CUBOID SUPPORT AND HEEL RETAINER

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3 Claims. (Cl. 36—71)

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This invention relates to improvements in a cuboid support and heel retainer, and more particularly to a foot supporting device designed to lend support to the os calcis and cuboid, which support may be easily positioned within an article of footwear, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

In the past, many and various types of foot supporting devices and appliances for insertion in an article of footwear have been developed. Frequently, these devices have been developed to perform a specific function, that is, each device was made to lend supporting aid or pressure to or remove objectionable pressure from one or more specific parts of the foot, and consequently the supports were of various designs. Of these formerly known devices, I am not aware that any of them was especially designed to lend support to the outer segment of the longitudinal arch and at the same time maintain the os calcis in correct position.

Accordingly, it is an important object of the instant invention to provide a foot supporting device designed to align the os calcis and astragalus on the inner border, and align the cuboid and os calcis on the outer border.

It is also an object of this invention to provide a foot supporting device capable of eliminating strain on the internal lateral ligament.

Still another object of the instant invention is the provision of a foot supporting device which, by acting more directly against the os calcis and the cuboid and the articulation therebetween, maintains the tarsus of the foot in its true relationship to the weight transmitting bones of the leg.

It is also a feature of this invention to provide a foot supporting device of the character set forth herein which is extremely light in weight, and takes up but a negligible space in an article of footwear.

Another object of the instant invention is the provision of a foot support of the character set forth herein which may be used independently of any other foot supporting device, or associated with substantially any other foot supporting device, and especially with a standard arch support.

Still a further feature of the instant invention

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resides in the provision of a foot supporting device shaped to substantially circumscribe the tuberosity of the os calcis and tend to prevent malposition of that bone.

While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawing, in which:

Figure 1 is a bottom plan view of a standard arch support equipped with a cuboid support and heel retainer embodying principles of the instant invention;

Figure 2 is a bottom plan view of an insole equipped with a cuboid support and heel retainer embodying principles of the instant invention;

Figure 3 is a side elevational view of the structure of Figure 1; and

Figure 4 is a fragmentary vertical sectional view taken substantially as indicated by the line IV—IV of Figure 1, looking in the direction of the arrows.

As shown on the drawings:

The main function of the instant invention is to maintain the os calcis or calcaneum in proper position against inward tilting or other malposition. While performing this function, the invention is also designed to lend support to the calcaneo-cuboid articulation and maintain that articulation in proper alignment against tilting of the os calcis and consequent rotation of the cuboid. At the same time the device also lends positive support to the articulation between the fifth metatarsal base and the cuboid and so aids in directly supporting the outer segment of the longitudinal arch. In addition, the instant invention maintains the os calcis and astragalus in proper alignment on the inner border of the foot through the sub-astragalo joint to provide the proper freedom and diversity of motion in the astragalo-scaphoid joint, thus giving the required flexibility to the inner segment of the longitudinal arch. The thrust and stress of weight bearing from the head of the astragalus is thereby transmitted properly to the scaphoid and in turn properly transmitted to the cuneiform bones so that the tarsus of the foot is held in true relationship to the weight transmitting bones, the tibia and fibula, of the leg and undue strain on

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the internal lateral or deltoid ligament is eliminated. I am not aware that in the past any foot correction device has been provided for the special purpose of performing the above functions and providing the above mentioned results.

The instant invention may be used alone or in conjunction with other foot supporting devices. To illustrate this I have shown the instant invention associated with what might be termed a "standard" arch support in Figures 1, 3 and 4. This standard arch support includes a top covering member 5, which may be of leather, fabric, or other suitable material, and an upwardly bowed spring element or plate 6 secured to the cover member in any suitable manner such as by rivets 7. The plate 6 may be made of metal, plastic, or other suitable material capable of withstanding the body weight, giving slightly when that weight is placed upon the plate, and resuming its original shape immediately upon release of the weight. The illustrated support is for disposition beneath the plantar surface of a right foot, and both the plate and cover are provided with a high mid-region 8 on the inside of the foot to correspond with the elevation of the inner segment of the longitudinal arch. The instant invention does not interfere in any manner with the arch supporting functions of the device just above described, and vice versa the arch support does not interfere with the instant invention performing its functions.

The illustrated embodiment of this invention includes a one-piece structure generally indicated by numeral 9 and which may be attached to the cover 5 of the arch support in any suitable manner such as by rivets 10. The arch support is shaped to underlie the plantar surface of the foot from the rear of the fleshy part of the heel up to approximately the metatarsal arch. The support 9 is preferably flush with the outside edge of the cover 5 and surrounds the supporting plate 6 to lend support to the border portions of the foot. As seen best in Figure 1, the anterior portion of the support is relatively narrow and extends from a point adjacent the fifth metatarsal head rearwardly beneath the articulation between the base of the fifth metatarsal and the cuboid, beneath the calcaneo-cuboid articulation, and then this narrower part, designated by numeral 11 merges into a wider portion 12 which curves around the os calcis. This portion 12 is also cup-shaped as seen clearly in Figures 3 and 4 to provide a curvate heel seat for the fleshy part of the heel to lend better stability to the foot as a whole, and aid particularly in preventing malposition of the os calcis. This wider portion 12 merges into a narrower portion 13 along the inner border of the foot, part 13 also elevating as seen in Figure 3 in keeping with the normal shape of a human foot. This part 13 may terminate, as illustrated, adjacent the astragalo-scaphoid articulation so as to lend some support to the fleshy part of the foot in that region.

The support 9 may be made of any suitable material, such as impregnated paper fiberboard, plastic sheets, phenolic resin laminates, cellulose acetate, or some other suitable thermosetting plastic material. The structure might even be made of metal, if so desired.

It will be noted that when the device is in position the tuberosity of the os calcis preferably seats just off the wider posterior portion 12 and the fleshy parts of the foot on each side and

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to the rear of the os calcis are supported by the device, as above explained. Consequently, the os calcis is maintained against malposition, the deltoid ligament is free from strain, and the tarsus of the foot is held in true relationship to the weight transmitting bones of the leg, as above explained.

In Figure 2 I have illustrated the use of the instant invention by itself. In this instance, it is desirable to cover the support 9 with a suitable leather or fabric insole member 14 preferably shaped in accordance with the normal plantar surface of a foot. The support may be secured to the insole member in any suitable manner, such as by the rivets 15. When the structure of Figure 2 is placed within an article of footwear, the support 9 functions in the manner above described.

It will be appreciated from the disclosures herein that the instant invention may function with other types of foot supporting elements, such as a metatarsal support, a lift for the astragalo-scaphoid junction, toe straightening attachments, etc.

From the foregoing, it is apparent that I have provided a simple, economical, and relatively lightweight foot support highly desirable for preventing weak foot or flatfoot by maintaining the os calcis against malposition and lending support to the associated foot bones and articulations to maintain the tarsus in proper relationship to the weight transmitting bones of the leg. It will also be noted that the device is simple to use, highly durable, and affords no discomfort to the wearer.

It will, of course, be understood that various details of construction may be varied through a wide range without departing from the principles of this invention and it is, therefore, not the purpose to limit the patent granted hereon otherwise than necessitated by the scope of the appended claims.

I claim as my invention:

1. In a foot supporting device, a flexible cover member, and a single-piece weight supporting member attached to the underside of said cover, said member having a relatively narrow portion extending only along the outer margin of said cover from the fifth metatarsal head rearwardly beneath the calcaneo-cuboid articulation of a foot to merge into a wider portion in the form of a curvate heel seat to underlie the posterior process of the os calcis, and another relatively narrow part extending only along the inner margin of said cover to underlie the foot adjacent the astragalo-scaphoid articulation.

2. In a foot supporting device, a flexible cover to underlie the plantar surface of a foot, and a marginal weight supporting member attached to the underside of said cover, said member underlying only a marginal part of said cover and being relatively narrow throughout its length, said member including a narrow part to underlie the outer longitudinal arch of the foot extending from the fifth metatarsal head rearwardly to merge with a wider part passing around the heel which in turn merges with a narrower part extending forwardly sufficiently to align the os calcis and astragalus.

3. In a foot supporting device, a cover, a spring plate secured to the underside of said cover to support the longitudinal arch of the foot and underlie the os calcis bearing point, and a weight supporting member relatively narrow throughout and separate from said spring plate secured to

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the marginal portion of said cover outside said spring plate, said member extending from approximately the fifth metatarsal head around the heel to a point substantially opposite the inside of the calcaneo-astragaloid articulation.

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