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ARCH SUPPORT MEANS

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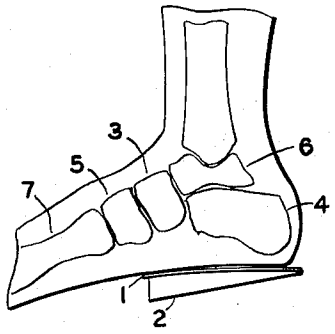


FIG 1

FIG 3



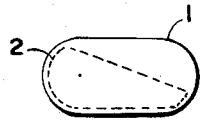


FIG 2

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ARCH SUPPORT MEANS

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1 Claim. (Cl. 36—71)

This invention relates to arch support means for the foot, and more particularly to such means for the support of the long arch by reenforcement of the scaphoid area to promote thereby the proper functioning of the foot.

The foot has two main arches; one from front to back, referred to as the long arch; the other across the broad part of the foot, referred to as the metatarsal arch. These arches normally are held in correct position by ligaments and muscles. The so-called flat foot and weak ankle conditions are due generally to weakness in the proximal ligaments and musculature, such weakness being caused mostly by ill fitting shoes and ill fitting arch supports.

The present invention directly supports the rear portion of the long arch and indirectly supports the front portion by placing the device under the heel bone and the scaphoid bone, which articulates with the heel bone. Thus the device is designed to hold back the heel and scaphoid bone, and, consequently, with them, the whole foot including the ankle, in correct position.

The present invention differs from the prior arch support in that it does not extend under the front portion of the long arch; it extends only to the proximity of the cuneiform bones, and then abruptly terminates at approximately the center of the arch. Prior arch supports usually extend the full length of the arch; rising at the center and tapering toward each end and to the outer side. The tapering of the front portion often does not conform properly to the configuration of the metatarsal bones, which are situated directly over it. This misconformation prevents the metatarsal bones and phalange bones from coming down to form in the metatarsum a firm front pillar for the long arch. The misconformation induces or aggravates disintegration of the metatarsal arch, which is comprised of the metatarsal bones and phalange bones. This brings on or aggravates collapse of the long arch. This causes the foot to roll and to slide forward into the front end of the shoe, cramping the toes and resulting in painful hammer toes, corns, callouses and bunions and general breakdown of the foot. When that occurs the ankle joint, too, collapses, and causes "weak arches," "weak ankles" and "flat foot."

Also, the prior arch support, mainly because of its bulk, often presses the top side (dorsum) and the underside (plantar) of the foot uncomfortably and improperly against the instep and sole of the shoe and sole of the arch support, holding the foot in an inflexible and in an unnaturally rigid position. This improperly causes impingement on the nerves, bones, muscles and blood vessels there and tends to cut off circulation so necessary to the person suffering from foot trouble.

The present invention is designed to prevent such interference with the muscular, vascular, nerve, bone and skin structures.

The present invention is more simply and compactly constructed than the conventional arch support; it is more adaptable to the foot and to the shoe and it can bring no impairment of the normal correct functioning of the foot.

The present invention permits and promotes the healthy and ideal development and strengthening of the foot in the exercise of the foot's natural activities.

The present invention may be referred to as a segmental arch support, a scaphoid-tarsus arch support, scaphoid reenforcement means, or loosely an ankle-arch support.

The present invention comprises a flexible flat member, which may be of leather or other appropriate substance,

and a resilient wedge member, which may be of rubber or other appropriate substance, fastened by, for instance, cementing, to the underside of the flat member. The flat member is rounded at the front and rear and straight on the other sides. The greatest thickness of the wedge is at its front inner side; it tapers to the heel and toward the outer side of the foot. The wedge has a straight longitudinal inner edge, and rounded front edge. Its outer edge follows an oblique line to the inner edge meeting it at the heel. When the two members are fastened together the device's rounded rear end fits into the heel of the shoe, and its rounded front end fits under the foot in the proximity of the cuneiform bones which articulate with the scaphoid bone.

Accordingly, a principal object of the invention is to provide new and improved arch support means.

Another object of the invention is to provide new and improved scaphoid and ankle support means, adaptable to fit any size of men's, women's or children's shoes.

Another object of the invention is to provide new and improved arch support means which reenforce the scaphoid area and consequently support the whole arch to thereby permit correct articulation of the bones forming the arch and to promote exercising and strengthening of the muscles and ligaments of the arch.

Another object of the invention is new and improved means for supporting the arch so that the foot will not slide forward as it does on the conventional arch support.

Another object of the invention is to provide new and improved arch support means comprising a flexible, flat member said flat member being rounded at front and rear and straight at the other sides, extending from the heel to a point just forward of the scaphoid bone; and a resilient wedge member attached to the underside of said flat member, said wedge tapering in both longitudinal and transversal directions and having its greatest thickness at its front inner side, said wedge member and fastened flat member terminating abruptly at the front end whereby the proximal bones may articulate correctly with the scaphoid bone.

These and other objects of the invention will be found in the following specification and drawings, of which—

FIG. 1 is a side view of an embodiment of the invention illustrating its position with respect to the foot bones, of right foot, inside view.

FIG. 2 is a plan view of the embodiment of FIG. 1, and

FIG. 3 is a front elevation of the embodiment of FIG. 1.

Referring to the figures, the invention generally comprises a flexible flat member 1 which may be of leather or other appropriate material such as plastic and a resilient wedge member 2 which is attached to the underside of member 1, by for instance cementing. In certain applications it may be desirable in order to add height to add additional resilient wedge member 2*a* under the wedge member 2. Wedge member 2 tapers from its thickest part at the front inner portion to the rear and toward the outer side of the foot. The member 1 will be shaped to the foot and member 2 by use. Member 1 is designed to overhang by 3/16" the front end and inner side of member 2.

The present arch support terminates abruptly at a point longitudinally about the middle of the average arch. The present device is designed to reenforce the scaphoid area, and is placed under the rear portion of the arch. This permits a natural unobstructed articulated movement of the bones in the forward portion, thereby exercising the muscle and ligaments which normally help to hold the arch bones in the proper configuration.

More particularly, the present arch support extends from underneath the heel bone to a point just forward of the front of the scaphoid bone 3.

The present arch support is designed not to extend to the forward portion of the arch. There is no tapering part under the forward portion to cause the foot to slide forward. The present invention is designed to hold the foot back in proper place and to permit and induce correct articulation of the bones to support the arch. As the wearer walks, the arch is free to flex and thereby to exercise and strengthen the ligaments and muscles and at the same time to hold the arch in proper configuration. The unobstructed area in front of the abrupt termination of the arch support members **1** and **2** frees the bones of the arch, including the astragalus **6**, the scaphoid **3**, calcaneum **4**, the first cuneiform bone **5** and first metatarsal bone **7** to articulate correctly with the proximal bones. The weight of the body transferring from the ankle bone, astragalus, **6** is mostly at the rear (scaphoid) of the arch; that weight is fully supported by arch support means **1** and **2**.

The present invention provides arch support means for the foot which are adapted to reenforce the rear of the arch which means terminate abruptly at about the longitudinal center of the arch, leaving unobstructed the forward portion and permitting the bones there to articulate correctly and thereby to induce exercise and strengthening of the proximal ligaments and muscles and thus to hold the arch in proper position.

The present invention is designed to reenforce the scaphoid area which usually is the site of the greatest weakness. The present device fits just forward of the scaphoid bone. It conforms to the ideal foot structure, is designed to hold the heel back in proper place, to prevent rolling of the foot and consequent friction, callouses, etc., and is designed to prevent the foot sliding toward the toe end of the shoe. It does not hold the foot in an unnatural rigid position such as conventional arches do but allows flexibility of the various joints of the foot. It does not press the instep against the top of the shoe and does not in any way impair the blood circulation of the foot which is so essential to the persons with foot trouble. The thickness of the rubber wedge is subject to adjustment for different wearers. However a thickness of approximately 1/16 of an inch at front inner side has been found preferable as a starting dimension. For ease of adjustment additional thicknesses of rubber wedges may be cemented together. The thickness of the rubber wedges is subject to adjustment to suit different wearers. However, for men's shoe sizes 10, 10½, 11 a desirable thickness would be a tapering of 1/16" at its front inner side to about 1/16" at the rear inner side. The tapered transversal thickness would be about 1/16" near the front outer side and about 1/16" at its front inner side. The invention may be made in various sizes for

men's, women's and children's shoes. The support, **1**, **2** extends substantially across the foot.

The present invention is designed, when placed under the heel bone and scaphoid bone, to hold the heel and thereby the whole foot including the ankle in correct position. This is done by the wedge tilting the scaphoid bone up toward the ankle (astragalus) bone back toward the heel bone (calcaneum) and in toward the cuboid bone. These bones together with the cuneiform bones articulate to form the tarsum, the long arch's rear pillar. The scaphoid bone serves as the rear spring stone of the arch. Mostly, the body's weight bears directly on this pillar which is connected to the leg bones (tibia and fibula).

The present invention is designed to thrust the stress upward and forward and distribute it over the long arch as the line of gravity shifts in walking, etc. Besides serving as a springstone the scaphoid bone also directly supports the astragalus (ankle). When the scaphoid falls through injury or weakness of the proximal ligaments and/or musculature of this bone or its articulated bones the ankle must fall with it. Hence "weak ankles."

The present invention is designed to remedy or prevent this trouble by reenforcement of scaphoid area to restore elastic natural-like movement of scaphoid and astragalus bones.

Many modifications may be made by those who desire to practice the invention without departing from the scope thereof which is defined by the following claim.

I claim:

Arch support means for the foot comprising a flexible flat member adapted to extend from the rear end of the heel to a point just forward of the scaphoid bone, a resilient wedge attached to the underside of said flat member said wedge linearly tapering in both longitudinal and transversal directions to the heel and outer side and having its greatest thickness at its front termination and inner side with respect to the foot, said flat member and wedge member terminating abruptly under the longitudinal center of the long arch, whereby the proximal bones may articulate properly with the scaphoid bone.

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