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J. KATZ ET AL

2,468,264

FOOT SUPPORT

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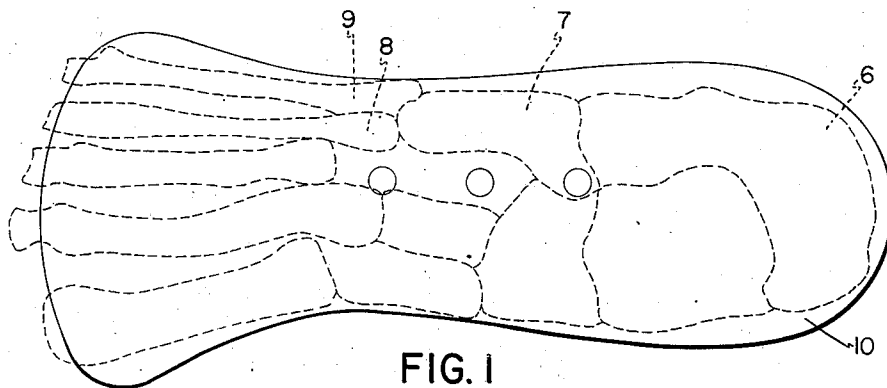


FIG. 1

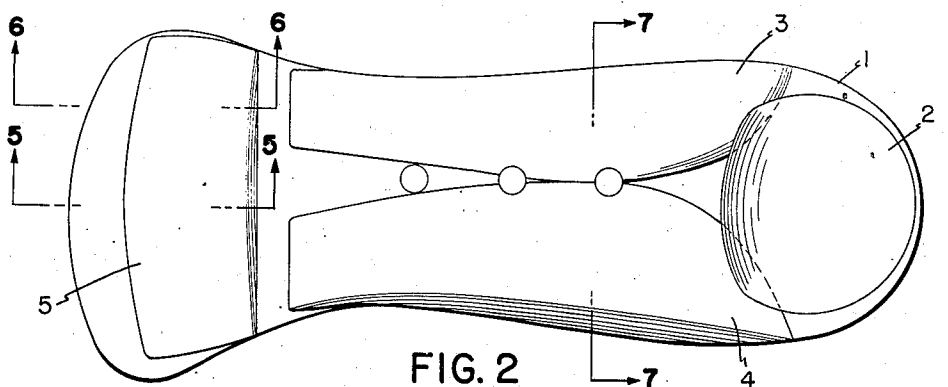


FIG. 2

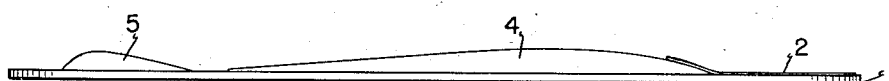


FIG. 3



FIG. 4



FIG. 7

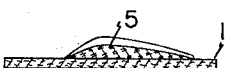


FIG. 5



FIG. 6

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FOOT SUPPORT

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1 Claim. (Cl. 36—71)

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The present invention relates to a foot support to be used within a shoe on the innersole for the purposes of relieving the foot from excessive pressures which may come in certain regions of the sole and heel and also to effect corrective measures in certain types of foot ailments.

In the structure of the foot, the anterior-posterior arch has at one end the heel bone or os calcis and at the other end the metatarsal bones. The bones of the leg known as the tibia and fibia are articulated to the foot through a bone called the astragalus which forms the key of the anterior-posterior arch. Between the metatarsal bones, on one end of the arch, and the astragalus and the os calcis, on the other end, are a group of bones by means of which the metatarsal bones are articulated to the ankle. These comprise a bone known as the cuboid which articulates with the fourth and fifth metatarsal bones and three other bones known as the cuneiform bones which articulate with the first, second and third metatarsal bones. These cuneiform bones are known as the external, middle and internal bones, the internal bone being in line substantially with the metatarsal bone of the great toe. The three cuneiform bones are connected with the key bone of the arch, the astragalus, by means of a bone known as the scaphoid, which is situated between the cuneiform bones and the astragalus. The transverse arch, which is the arch running substantially perpendicular to the anterior-posterior arch, includes the cuboid bone, the cuneiform bones and the scaphoid bone, which also form the arch portion of the anterior-posterior arch.

Arch supports to be used in a shoe frequently attempt to build up or support the external side of the arch and ordinarily neglect the condition which quite frequently prevails when the interior side of the transverse has been weakened and falls. Under conditions of this general nature, the scaphoid bone and the inner cuneiform bone are very apt to fall and instead of serving as structural elements in both the anterior-posterior and transverse arches, sag so that proper articulation between the various bones of the foot, which permits foot flexure in walking or other foot movements is greatly impaired.

The article according to the present invention has for its purpose the proper relative support of the scaphoid bone in the inner side of the foot, the cuboid on the outer side of the foot, and the metatarsal bones on the forward part of the anterior-posterior arch. The objects and merits of the present invention will be more readily un-

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derstood from consideration of the specification below when taken in connection with the drawings illustrating an embodiment of the invention, in which:

Figure 1 shows the foot support in plan with the relative bones of the foot illustrated in approximate positions in dotted lines.

Figure 2 shows a plan view of the same article of Figure 1 with the cover portion removed.

Figure 3 shows a side view of the article of Figure 2 as viewed from the bottom of Figure 2 looking upward.

Figure 4 shows an end view of the article of Figure 2 as viewed from the left.

Figure 5 shows a section taken on the line 5—5 of Figure 2.

Figure 6 shows a section taken on the line 6—6 of Figure 2, and

Figure 7 shows a section taken on the line 7—7 of Figure 2.

In the device shown in the figures, the base 1 may be composed of leather, fabric or suitable yielding composition which may be soft, thin leather or its equivalent. The base is shaped like the inner sole but extends forward only in the region beneath the metatarsal bones. On this base at the right end is mounted a heel pad 2 of thin, soft, yielding material, as for instance, a soft suede leather or some soft fabric. At each side of the base there are mounted two elongated pieces 3 and 4, the element 3 being positioned on the outer side of the foot and the element 4 on the inner side of the foot. These individual pieces are each composed preferably of a cork material or its equivalent. These elements and transverse forward piece 5 should all be of substantially the same material having a comparatively soft surface but substantially not compressible and capable of holding a permanent shape. The material should also be light and preferably moisture absorbent of such a nature as cork usually is.

The three separate pieces 3, 4 and 5, have particular shapes and positions on the sheet 1 for the functions for which they are to serve, these positions and shapes being related specifically to the foot structure and more particularly to the bones forming the foot arches.

The piece 3 lies under a portion of the os calcis bone 6, the cuboid bone 7, and if desired, to some extent under the near end of the fourth and fifth metatarsal bones 8 and 9. This piece 3 is wedge-shaped transversely as is indicated in Figure 7, with the thickest portion on the outside edge of the base 1. It will also be noted that the piece 3

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is narrower in the forward portion toward the metatarsal joint position and that the wedge gradually reduces in thickness in both longitudinal directions from a high point extending under the position of both the cuboid and os calcis bones.

The piece 4 complements the piece 3 on the other side of the base or sole piece 1. This piece 4 is wedge-shaped transversely sloping toward the middle of the base 1 with the highest portions coming under the position of the scaphoid bone and sloping both in a forward and rear direction to the first metatarsal and internal cuneiform bones at the forward end of the arch and the os calcis at the rear of the arch respectively. This piece 4 is wider than the piece 3 and higher than the piece 3 at corresponding points and also not as sharply sloped toward the middle of the base as the piece 3 so that the piece 4 actually in many cases may contact quite fully the scaphoid bone. It will also be noted that the piece 4 at its widest part is about twice its narrowest width at its forward end.

The cross bar or piece 5 falls under the middle or rear portions of the five metatarsal bones, being higher under the fourth and fifth bones than under the first, second and third. As seen from Figure 4, the cross bar slopes inward in a comparatively long wedge across the metatarsal bones, being highest under the two outer metatarsal bones.

It will also be noted that the side pieces 3 and 4 slope rearward to provide a hollow to permit the support of the os calcis bone in the position of the soft pad or circle 2. A soft thin cover 10 covers the entire support and the central section of the article has a number of holes to permit ventilation.

The support of the foot by the two side pieces and the cross bar as above set forth, causes the pressure to be evenly distributed, so that the various bones of the foot, particularly when the arches have fallen, will not unduly be under excessive pressure.

In the present case, particular attention is paid to raising the inner side of the arch under the scaphoid and inner cuneiform bones, and to compensate the outer side under the cuboid bone so as to balance the foot pressure over the sole of the foot while the cross bar raises the meta-

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tarsal bones to tilt the foot and equalize the pressure between the forward and rear end of the longitudinal arch.

Having now described our invention, we claim:

A foot support to be worn in the inner sole of the shoe, comprising a sole piece of uniform yielding sheet material, a heel cup pad of soft material attached on the face of said sole piece in the position of the ball of the heel, a continuous elongated piece of cork material having a flat face surface attached to the sole piece and extending lengthwise thereof from the heel pad forward to a position under the fourth and fifth metatarsal joints, said cork piece being raised along its outer edge and sloping transversely to the surface of the sole piece in the longitudinal central region thereof short of the middle line of the sole piece with the broadest section of the cork piece located under the cuboid bone, a second continuous elongated piece of cork material similar to said first piece positioned along the inner side of the sole piece sloping transversely from the edge thereof to the surface of the sole piece extending from the heel pad forward to a position under the first and second metatarsal joints, and extending over the middle line of the sole piece in the region of the scaphoid bone and being higher in said region than otherwise along its length and higher than said first elongated piece, and a cross piece of cork material located forward of the metatarsal points spaced from the ends of said elongated pieces.

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