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H. E. HUKILL

2,486,653

BASIC ARCH FOUNDATION

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FIG. 1.

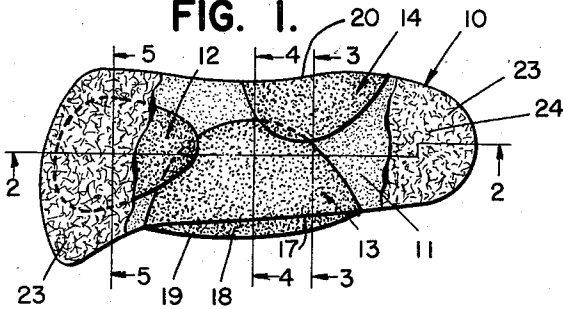


FIG. 2.

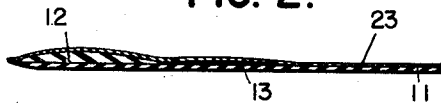


FIG. 3.

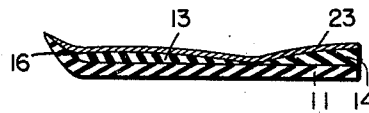


FIG. 4.

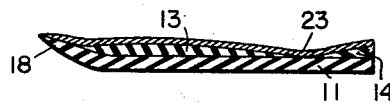


FIG. 5.

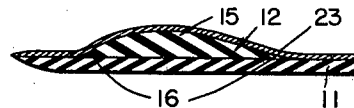


FIG. 6.

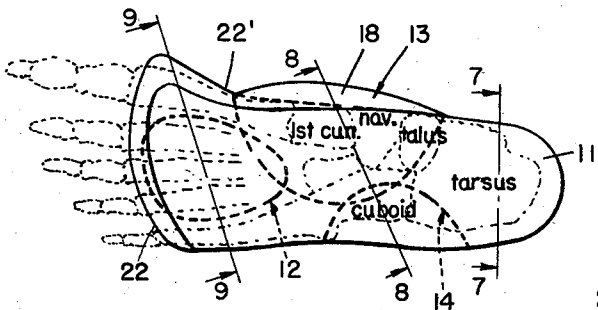


FIG. 7.

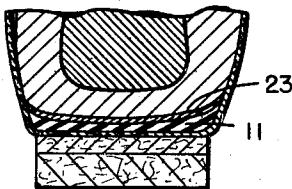


FIG. 9.

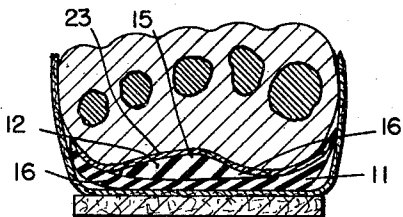
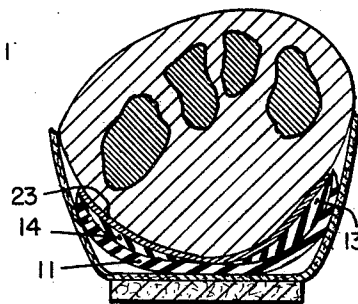


FIG. 8.



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BASIC ARCH FOUNDATION

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2 Claims. (Cl. 36—71)

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This invention relates generally to devices known as arch supports commonly used in shoes for supporting and strengthening muscles of the foot.

Many so-called arch supports, consisting usually of variously shaped pads, function only to support the arches of the foot and to my knowledge prior devices of this character have been ineffective to correct the trouble or improve the condition of the foot. In some instances this is due to the fact that the shape and contour of the supporting area of the support is improperly designed and also to a large extent to the fact that such areas or pads fail to possess the proper degree of resiliency necessary to properly massage the muscles of the foot and thereby restore tone and elasticity to the muscles.

It is a primary object of this invention to provide a new and improved device which is a basic arch foundation for wear in a shoe for use in treating a foot to assist nature in restoring tone and elasticity to the muscles by exerting a massaging action on the muscles while at the same time giving support to the foot.

It is a particular object to provide a resilient member having bone and arch supporting and massage portions of different degrees of resiliency, the degree of resiliency of each portion being proportioned to the particular function that that portion is designed to perform.

It is also an object of this invention to provide a device for use in shoes which supports the foot against slippage and tends to lock the heel and adjacent portion of the foot in correct position to prevent rotation or roll thereof.

It is a particular object to provide a flat resilient sole member having resilient raised padded areas thereon designed and positioned to support and massage certain areas of the foot as will become apparent from a description of the device.

These and other objects will be apparent from the accompanying drawing and following description. Referring to the drawing, which is for illustrative purposes only:

Fig. 1 is a plan view of an arch foundation device embodying the invention;

Fig. 2 is a longitudinal section on line 2—2 of Fig. 1;

Fig. 3 is an enlarged cross section on line 3—3 of Fig. 1;

Fig. 4 is an enlarged cross section on line 4—4 of Fig. 1;

Fig. 5 is an enlarged cross section on line 5—5 of Fig. 1;

Fig. 6 is an inverted plan view of the arch

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foundation device of Fig. 1, showing the relation of the device to the bone structure of a foot;

Fig. 7 is a cross sectional view taken through a shoe and foot therein with the device positioned in the shoe taken in a plane approximating that indicated by the line 7—7 of Fig. 6;

Fig. 8 is a cross sectional view similar to that of Fig. 7 but taken on a plane approximating that indicated by the line 8—8 of Fig. 6; and

Fig. 9 is a cross sectional view similar to Fig. 7 but taken on a plane approximating that indicated by the line 9—9 of Fig. 6.

Referring to the drawing for a more detailed description of the invention, reference numeral 10 generally indicates an arch-supporting and muscle-massaging device embodying the invention. This device will be termed an arch foundation or support although it is to be understood that as heretofore indicated the device not only acts as a support but also massages the muscles of the foot, aiding in restoring elasticity and tone to the muscles.

The device 10 comprises principally a resilient flat sole member 11, which may be formed of a sponge rubber or other soft resilient material, and three pads or arch supporting elements including a forward pad 12, an intermediate pad 13 and a rear pad 14. These pads may be mounted on the upper surface of the sole 11 by means of suitable cement or otherwise secured thereto, or the sole member and pads may be molded together in one piece. The pads are preferably made of sponge rubber, although some other material of similar characteristics might be used, and vary in resiliency.

The forward pad 12 is shaped substantially egg-shaped in plan or in the form of a triangular area with rounded corners having a relatively thick central section 15 and tapering gradually to thin edge sections 16. The pad is located medially of the forward end of the sole 11, as indicated in Fig. 1. Preferably this pad is the softest and is designed to underlie the intermediate portions of the second, third and fourth metatarsal bones posteriorly of the heads thereof.

The intermediate pad 13 is formed thinner and stiffer than the forward pad and, in the form of the invention shown, is substantially semi-circular in form, the straight edge 17 thereof lying along the inner edge of the sole 11. Intermediate the ends of the sole 11 and substantially centrally located, there is provided an upwardly extending lip 18 having an outer convexly arcuate surface 19. The intermediate pad is designed to underlie the navicular, first cuneiform and base of the first metatarsal bones of a foot.

Somewhat rearwardly of the intermediate pad and at the opposite side of the sole is mounted the rear pad 14 which preferably is slightly thicker than the intermediate pad and is substantially semi-circular in form with a substantially straight side 20 extending along the outer side of the sole. This pad is designed to underlie the cuboid bone and partially underlie the tarsus bone of a foot thereon and is preferably firmer than either of the other pads.

The sole member 11 is preferably tapered to a thin edge section at the forward end and along its inner edge to the heel portion, as indicated by numerals 22, 22' in Fig. 6. A cover or top sole element 23 is provided to form a suitable surface for engagement with the foot. This top sole may be a thin sheet of leather or similar material cemented to the pads and the bottom sole 11.

In Figs. 6-9 the device is shown in position in a shoe with relation to a foot. Referring particularly to Fig. 6, it will be apparent that the arch support is so proportioned as to extend from the heel of the foot up to just short of the toes in such a manner that the forward pad 12 forms a support for the metatarsal arch, underlying the intermediate portions of the second, third and fourth metatarsal bones posteriorly of the heads thereof. Due to the soft resilient nature thereof, in action, this pad massages the muscles of the foot in the region of the metatarsal arch thereby tending to restore elasticity of these muscles.

The intermediate pad 13 and the lip 18 of the sole tend to support the inner longitudinal arch of the foot, the pad 13 underlying the navicular, first cuneiform and base of the first metatarsal bones of the foot, as shown in Fig. 6. On the opposite side of the sole, the rear pad 14 underlies the cuboid bone and partially underlies the tarsus. In action the rear pad supports the tarsus and tends to move it, up to raise the cuboid bone into proper position with relation to the tarsus while at the same time exercising the muscles in the region of these bones. In addition, the sole 11 in the region of the heel portion indicated by numeral 22, being of a soft sponge rubber or similar material, forms a pocket for the heel of the foot, the heel portion extending up and around the sides and the back of the heel. This tends to lock the tarsus and the navicular bones into position and to prevent rotation or roll thereof, termed "pronation."

It is to be understood that the device is designed to be worn in a shoe and when so worn the three raised areas or pads and the sole portion of the device cooperate to lend proper support to the metatarsal and longitudinal arches of the foot, and when the foot is in action, the device, by reason of its shape and resiliency, massages the muscles of the foot to restore their tone and elasticity.

It is, of course, contemplated that various changes and modifications can be made in the particular form of the invention shown and described without departing from the scope of the invention as set forth in the claims.

I claim:

1. In a device of the type described, comprising a sole formed of resilient material having a resilient egg-shaped forward pad on said sole medially of the forward portion of the sole tapering from a high relatively thick central portion to thin edge portions, said pad being adapted to underlie the second, third and fourth metatarsal bones of a foot thereon, a semi-circular resilient intermediate pad intermediate its ends with its straight side at the inner margin of said sole in a region to underlie the navicular, first cuneiform and base of the first metatarsal bones of a foot thereon, and a semi-circular resilient rear pad with its straight side at the outer margin of said sole disposed slightly rearwardly of said intermediate pad in position to underlie the cuboid and partially underlie the tarsus bones of a foot thereon, said forward pad being relatively wide in comparison with its length and being disposed with its longitudinal axis inclined with respect to the longitudinal axis of said sole and in the direction of said rear pad, said forward intermediate and rear pads having overlapping areas of limited extent.

2. In a device of the type described, comprising a sole formed of resilient material having a resilient egg-shaped forward pad on said sole medially of the forward portion of the sole tapering from a high relatively thick central portion to thin edge portions, said pad being adapted to underlie the second, third and fourth metatarsal bones of a foot thereon, a semi-circular resilient intermediate pad intermediate its ends with its straight side at the inner margin of said sole in a region to underlie the navicular, first cuneiform and base of the first metatarsal bones of a foot thereon, and a semi-circular resilient rear pad with its straight side at the outer margin of said sole disposed slightly rearwardly of said intermediate pad in position to underlie the cuboid and partially underlie the tarsus bones of a foot thereon, said forward pad being relatively wide in comparison with its length and being disposed with its longitudinal axis inclined with respect to the longitudinal axis of said sole and in the direction of said rear pad, said forward intermediate and rear pads having overlapping areas of limited extent, and a thin, flexible cover sole shaped to correspond to said sole overlying said sole and the pads thereon.

HARRY E. HUKILL.

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