

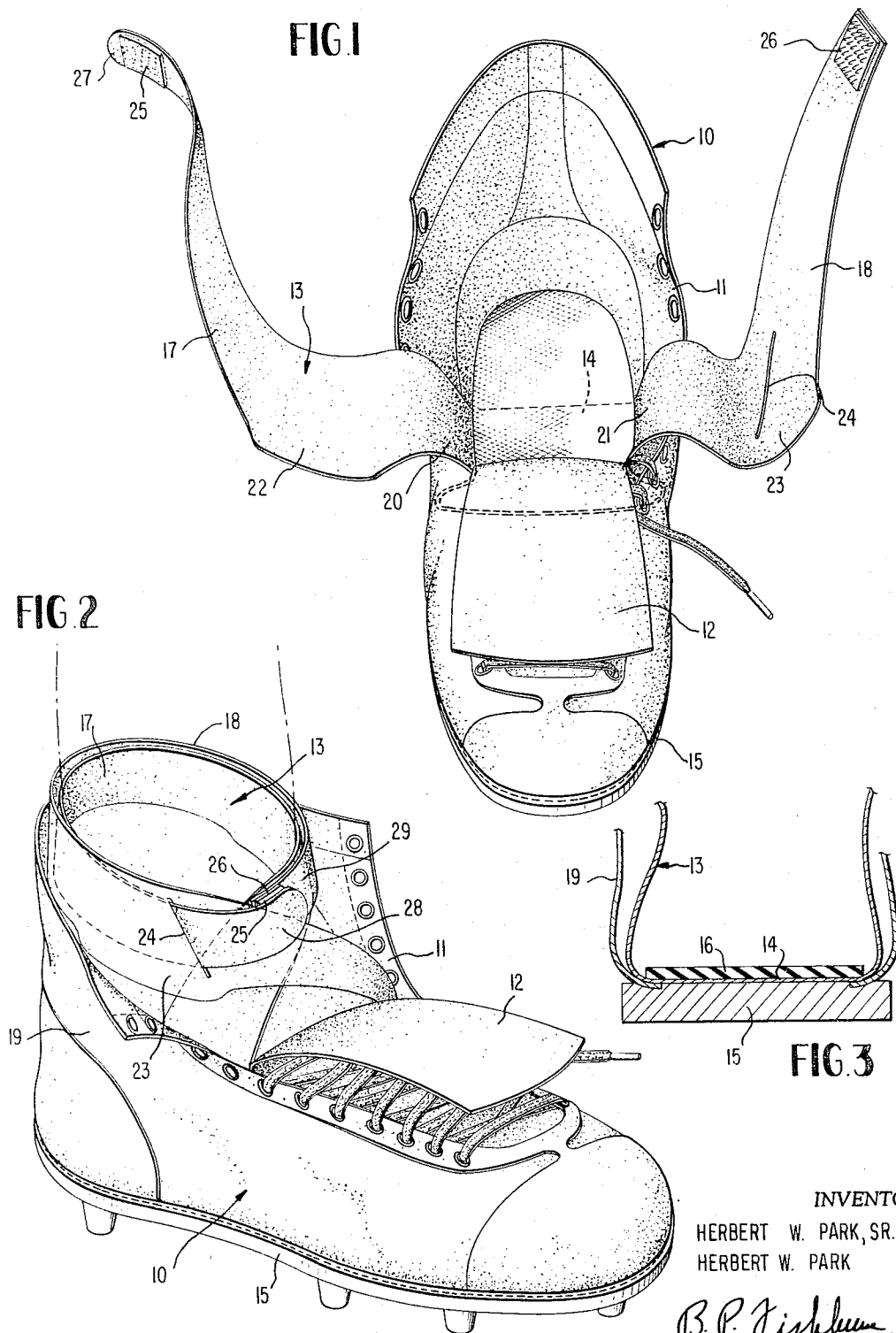
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ATHLETIC SHOE WITH INTEGRAL FLEXIBLE ANKLE SUPPORT

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ATHLETIC SHOE WITH INTEGRAL FLEXIBLE ANKLE SUPPORT

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ABSTRACT OF THE DISCLOSURE

A flexible ankle brace for a shoe, said brace being attached to the shoe sole beneath the arch of the foot and including extensions on opposite sides of the sole of sufficient length to encircle the ankle and that portion of the leg immediately above the ankle, the extensions having terminal end fastener means.

Experience has proven that athletes are continually hampered and their careers are shortened because of unstable ankles resulting in frequent ankle injuries. Once the stability of the ankle mortise is compromised, there is limited likelihood for the injured individual to return to strenuous athletics. Ankle strapping, taping and the use of high top shoes are of some assistance in stabilizing the ankle. However, such means are not completely effective and do not satisfactorily control the problem of ankle injuries in sports such as football and basketball.

Accordingly, the main object of this invention is to provide an effective ankle support which will greatly increase the stability of the collateral ligamentous structure of the human ankle.

Another and more specific object is to accomplish the above aim by utilizing a flexible strap-type support which is firmly anchored to the sole of the shoe so as to provide a substantially rigid reaction member beneath the foot at all times. This, in conjunction with a unique method of wrapping the strap-type support around the lower leg (distal fibula-tibia area), has been found to lend the maximum possible support and stability to the ankle and, in fact, renders turning of the ankle and serious straining thereof almost impossible, even in heavy contact sports such as football. The brace or support of this invention gives stability to the deltoid and fibulo-talar and talocalcaneal ligaments without significantly restricting physiological movement. It therefore serves well in preventing ligamentous sprains and tears in active sports.

A further object is to provide an integrated shoe and ankle brace structure which will find broad utility in sports, medicine (prevention and treatment of weakness or injuries of the ankle) and the armed services (especially paratroopers).

Other objects and advantages of the invention will become apparent during the course of the following detailed description.

In the accompanying drawings forming a part of this application and in which like numerals are employed to designate like parts throughout the same,

FIGURE 1 is a perspective view of a shoe embodying the ankle brace structure of the invention, looking essentially at the top of the shoe and with the shoe closure opened and the flexible ankle brace extended;

FIGURE 2 is a perspective view of the invention looking essentially at the side of the shoe and having the brace applied to the ankle prior to closing the shoe; and

FIGURE 3 is an enlarged fragmentary transverse vertical section through the shoe and brace structure showing the attachment of the latter to the shoe sole.

In the drawings, wherein for the purpose of illustration

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is shown a preferred embodiment of the invention, the numeral 10 designates an athletic shoe of the high top class, such as a football shoe, hockey shoe or the like. The athletic shoe 10 has a conventional lace-type closure 11 and tongue 12, as indicated in the drawings.

The ankle brace or support embodying the main feature of the invention comprises an elongated flexible strap member 13 having a central relatively wide portion 14 thereof firmly and permanently anchored to the top face of the shoe sole 15 and extending for substantially the entire width thereof, as best shown in FIGURE 3. The particular means of anchoring or fastening the ankle brace to the shoe sole may vary according to the invention. The elements may be adhesively joined by a strong bonding cement, as shown, or the strap portion 14 may be nailed, riveted or otherwise fastened to the sole in any known manner. The strap portion 14 is preferably disposed between the outsole of the shoe and a suitable insole 16.

The flexible ankle brace 13 includes approximately equal length branches or sections 17 and 18 extending upwardly from the opposite sides of the shoe sole 15 and the lower portions of these sections 17 and 18 are inside of the shoe upper 19, FIGURE 3, until they emerge through the open lace closure, as shown in FIGURE 1. The sole-attached portion 14 of the brace is disposed approximately below the arch of the foot and is wide enough longitudinally of the shoe sole to underlie the major portion of the area of the foot arch.

Upon emerging from beneath the insole 16, the sections 17 and 18 have relatively narrow regions 20 and 21, blending into somewhat wider strap regions 22 and 23. The strap region 23 is provided with a diagonal slit 24 through which the free end of the opposite section 18 is passed when the brace is fastened about the ankle as shown in FIGURE 2. Outwardly of the regions 22, the flexible brace becomes narrower and tapers toward its free ends, as shown clearly in FIGURE 1.

At the free ends of the sections 17 and 18, there is provided a fastening and adjusting means of the type disclosed in United States Patent 2,717,437, granted Sept. 13, 1955, to George de Mestral. This type of fastener comprises flexible "gripping material" and includes a female portion or strip 25 secured firmly to the terminal end portion of strap section 17 and a male strip or portion 26 similarly secured near the terminal end of strap section 18. The operation of this patented material for attaching or securing two members is well known and need not be further described. Other types of fasteners for the strap ends may be employed, if preferred, such as buckle means or lacing eyelets or the like. The fastener means illustrated in the drawings is preferred and is known to have a powerful holding force and is not bulky and is flexible so as to be comfortable during use. It is also readily adjustable and involves no metal parts. A free tip portion 27 is provided on the strap section 18 to facilitate separating the male and female strips 26 and 25 of the fastener.

The use of the device and its mode of application to the ankle is shown primarily in FIGURE 2.

The foot is inserted into the shoe while the brace is extended as in FIGURE 1. The tongue 12 and the shoe top or upper may be rolled down to expose the ankle.

The two strap sections of the brace are drawn upwardly firmly on opposite sides of the foot at the instep and are then crossed over the front of the ankle with the section 18 having the slit 24 arranged outermost or uppermost, FIGURE 2. The two sections are then completely passed around the sides and back of the lower leg, immediately above the ankle, and in so doing, the two sections or strap portions overlap at the rear of the leg. The strap section 17 at the rear of the leg is inside of the encircling strap section 18 having the slit 24. As one side

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of the leg, FIGURE 2, the free end of the section 17 is passed through the slit 24 of section 18 so that both terminal ends 28 and 29 will be exposed at the front of the leg immediately above the instep with the coacting fastener elements 25 and 26 arranged in opposition so that they can be merely pressed together in gripping relation, as shown in FIGURE 2. This completes the application of the brace or support to the ankle.

The relatively wide contoured portions 22 and 23 of the strap sections lie at the sides of the leg during use to give the greatest possible lateral support. The composite support 13 is in effect wrapped about the ankle and leg in a figure-eight configuration, as shown, and this has been determined to be the most effective manner of applying the brace so as to give the greatest possible support and stability to the ankle. It also results in placing the fastener 25-26 conveniently at the front of the foot for ease of manipulation. After the brace is completely and snugly applied, the laced closure of the shoe is drawn up and closed in the usual manner on top of the brace and this further supports and stabilizes the ankle.

It is emphasized that the brace 13 at all times is anchored to the shoe sole below the foot so that there is a solid reaction member beneath the foot which firmly resists any tendency for the ankle to turn over laterally. It is the combined functioning of the flexible brace firmly wrapped around the ankle and leg in a figure-eight configuration and the reactive effect of the rigid sole resisting tension in the brace in response to a lateral turning tendency of the angle which renders the composite invention most effective.

The entire structure can be formed of leather or any other suitable substantially non-stretch material. The brace per se could, for example, be formed of canvas or like fabric. If desired, the inner face of the brace can be lined for comfort with a soft material. However, in any case, the thickness of the brace is most desirably held to a minimum, as shown in FIGURE 2.

It is to be understood that the form of the invention herewith shown and described is to be taken as a preferred example of the same, and that various changes in the shape, size and arrangement of parts may be resorted to, without departing from the spirit of the invention or scope of the subjoined claims.

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The invention having thus been described, what is claimed is:

1. An athletic shoe structure and ankle brace comprising in combination a shoe body portion having a stiff sole and a front closure, an elongated flexible strap ankle brace extending transversely of the shoe sole and having a central wide portion fixedly and firmly secured to the shoe sole adjacent the arch of the foot and underlying the arch when the foot is within the shoe, said brace having end portions on opposite sides of the sole of sufficient length to allow the brace to encircle the ankle and leg in a figure-eight configuration, and fastener means on the brace near the opposite terminal ends thereof operable to secure the brace tightly bound to the ankle and leg, said fastener means being located at the front of the leg during use.

2. The invention as defined by claim 1, and wherein one of said end portions has a slit formed therethrough near its midpoint to receive the other end portion therethrough when the brace is applied to the ankle and leg.

3. An ankle brace and athletic shoe integrated structure comprising a high top athletic shoe having a front lace closure and stiff sole, an elongated flexible strap ankle brace attached firmly to said sole near the longitudinal center of the sole and near the longitudinal center of the ankle brace, whereby the sole and ankle brace are in crossed relation, the ankle brace including end portions on opposite sides of the sole of sufficient length to encircle the ankle and that portion of the leg immediately above the ankle, said end portions on opposite sides of the sole including relatively wide intermediate regions and gradually tapering terminal portions outwardly of said wide regions, the center portion of the ankle brace attached to said sole being the widest portion thereof, and readily detachable coacting fastener means on the terminal ends of the ankle brace.

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