ATHLETIC SHOE WITH INTEGRAL FLEXIBLE ANKLE SUPPORT

FIG. 1

FIG. 2

FIG. 3

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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-dibia 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 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 outside 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 25 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 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 come 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 firmly and oppositely attached to the opposite sides of the foot at the instep and are then crossed over the front of the ankle with the sections 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 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
of the leg, FIGURE 2, the free end of the section 17 is
passed through the slit 24 of section 18 so that both ter-

minal ends 28 and 29 will be exposed at the front of the
leg immediately above the instep with the coating fasten-
er 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 ap-
plying 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 an-
chored to the shoe sole below the foot so that there is a
solid reaction member beneath the foot which firmly re-
sists 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 con-
figuration and the reactive effect of the rigid sole resisting
tension in the brace in response to a lateral turning tend-
cy of the ankle 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 pre-
ferred example of the same, and that various changes in
the shape, size and arrangement of parts may be re-
sorted to, without departing from the spirit of the inven-
tion or scope of the subjoined claims.

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

1. An athletic shoe structure and ankle brace compris-
ing 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 oper-
able 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 there-
through when the brace is applied to the ankle and leg.

3. An ankle brace and athletic shoe integrated struc-
ture 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 gradu-
ally 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 coating fastener means on the terminal ends
of the ankle brace.

References Cited

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PATRICK D. LAWSON, Primary Examiner.