An appliance for modifying the traction and noise generating characteristics of footwear, including a traction element, typically constructed of felt material, and an attachment system adapted to anchor the traction element to the bottom surface of footwear to restrain the traction element from longitudinal and transverse movement with respect to the footwear.
DETACHABLE NOISE REDUCTION AND TRACTION ENHANCING ELEMENT FOR FOOTWEAR

RELATED APPLICATIONS

[0001] This application claims the benefit under 35 U.S.C. 119(e) of the filing date of Provisional Application Serial No. 60/386,993, filed Jun. 10, 2002, for “DETACHABLE TRACTION ELEMENT FOR FOOTWEAR.”

BACKGROUND

[0002] 1. Field of the Invention

[0003] This invention pertains to footwear, and particularly to friction soles for footwear used in sporting and working environments. It provides a detachable traction element which may be attached to shoes or boots to provide friction characteristics matched to changing circumstances of use.

[0004] 2. State of the Art

[0005] The traction and noise generating characteristics of the sole components of footwear are of particular significance in certain special purpose applications. The soles of shoes and boots used for hunting, fishing, hiking and other outdoor pursuits, for example, are conventionally constructed of materials regarded as generally suitable for their intended environments of use. Those materials are often not ideal for all use conditions, however. Similar problems are presented by the soles of footwear used in certain occupations, notably by roofers, warehousemen, construction workers, members of Special Forces or SWAT teams, and others confronted by changing or otherwise challenging use conditions. For instance, it would be an improvement if footwear worn by Special Forces teams could be quickly modified to dampen noise generated while running on concrete, to reduce likelihood of alerting a surveillance target. In a similar application, hunters would benefit from a device operable to reduce boot-generated noise during a stalking attempt.

[0006] U.S. Pat. Nos. 6,023,859; 5,996,252; 5,799,418; 5,600,902; 5,024,008; 4,924,608; and 3,903,620 all generally relate to expedients for enhancing the traction or noise generating characteristics of specialized footwear. The disclosures of these patents are incorporated by reference in this disclosure for their respective teachings concerning the construction of footwear, the special needs of certain use applications, and the materials generally available to innovators in the field of footwear design. It is known to apply supplemental soles to the bottom contact surfaces of boots. Such supplemental soles are intended to improve the traction characteristics of the boots for use in specific circumstances. Relatively thin and stiff felt soles are sometimes glued to the bottoms of “rubber” hip boots or waders, for example. As used herein, the term “rubber” is intended to include any material having properties similar to those of natural rubber, including synthetic rubbers and other materials regarded by the consumer as being rubber or rubber-like.

[0007] Available devices operable to change the characteristics of commercially available footwear suffer from certain limitations. The aforementioned glued-on felt wader soles provide a generally stiff felt sole to provide increased wear and longer life of the sole. However, the footprint of the felt sole is in conformance with the size of the boot sole, and therefore provides a minimal area for developing traction. The hard felt sole generally fails to conform adequately to certain rock surfaces to generate a desired amount of traction. Devices constructed according to the disclosure of the ‘418 patent are known detrimentally to increase the temperature of a foot inside a boot on which such device is mounted, can actually impair traction by providing a slippery fur traction surface, and even fail to stay in an installed position on a boot that is placed into aggressive service, such as in climbing a hill.

BRIEF SUMMARY OF THE INVENTION

[0008] The present invention provides a novel appliance for modifying the traction characteristics of footwear. The appliance of this invention is particularly useful in connection with hunting boots, hiking boots, “rubber” overshoes and waders of the type used by fishermen, hunters or others, while wading streams or traversing other submerged areas. Certain embodiments of the invention can reduce noise made while stalking prey. It is equally useful with shoes or footwear used in contexts other than outdoor sports, such as to reduce noise generated by heel strikes when running on concrete.

[0009] The appliance of this invention is generally configured as a sole element with suitable connection mechanisms to firmly and reliably, although temporarily, fix the sole element against the normal traction surface of footwear. The traction and noise generating characteristics of the thus-modified footwear thereby become those of the sole element. The characteristics contributed by the removable sole will be dependant upon several factors, including the physical properties of the materials of construction of the sole and its dimensions.

[0010] Various materials of construction are within contemplation, and proper selection depends, in part, upon the particular application of interest. In the case of hip boots or waders, a relatively soft and thick felt material is presently preferred to improve over even commercially available waders having felt soles. “Softer” and/or thicker materials are currently preferred for traction elements attached to waders or hip boots, because they provide improved traction on submerged rocky surfaces. “Dry land” applications may also benefit from a more thick and soft traction element, although thinner and stiffer soles are operable in certain cases.

[0011] Ideally, the traction element provides a larger footprint than is provided by the original contact surface of the footwear to which the traction element is attached. The thus-enlarged contact surface provides increased traction and stability.

[0012] The traction element may be held against the bottom, or contact surface of the original sole of the original footwear by any convenient system of straps, laces, elastic bands and/or comparable flexible strands. It is important that the attachment system hold the traction element against undue movement in any transverse direction. The term “transverse” is intended to include any direction generally parallel the bottom of the original sole.

[0013] Presently preferred coupling arrangements include a forward component, comprising flexible straps anchored to
the top of the traction element in a pattern arranged to
enclose the toe portion of the foot enclosure of a boot or
shoe. A forward most portion of this component (usually, a
single strap) firmly engages the forward most portion of the
foot enclosure. A rear component is similarly constructed
and arranged to capture the heel of the foot enclosure. This
rear component preferably includes a flexible link, connect-
ing an ankle strap to the heel-capturing elements. One
flexible link can be constructed as a “crow’s foot” operable
to resist lateral motion of the footwear’s heel. When the
ankle strap is positioned around the ankle portion of a foot
enclosure, such as a boot, or even of the ankle of the user,
forward movement of the foot enclosure with respect to the
traction element is inhibited.

[0014] Straps, or structure of a retainer system, may
incorporate various mechanisms for making an adjustment
in length to retain the traction element in engagement with
a foot enclosure, such as a boot or wader. For example,
an ankle strap may pass through an aperture to double back on
itself to be secured by a hook and loop closure system. One
operable hook-and-loop closure system that is commercially
available is commonly designated Velcro™. Buckles,
including quick-release buckles, may also be utilized in an
adjustable retainer system.

[0015] Various modifications can be incorporated into the
invention to provide special characteristics. For example,
scent pads may be attached to or mounted within the traction
element for hunting applications. Scent may even be applied
directly, such as by spraying or pouring, to the traction
element in certain cases. Cleats or spikes may be mounted
to protrude from the bottom of the traction element. It is
practical to provide the appliances of this invention in
coordinated sets, such as varying in thickness or some other
characteristic, thereby enabling a user to select traction
characteristics appropriate for changing conditions of use.

[0016] One embodiment of the invention can be described,
in general terms, as an appliance for modifying the traction
characteristics of footwear. Such an appliance typically
includes a traction element, or oversole, which can be
constructed of felt material. Oversoles can be characterized
as prismatic members, typically providing a larger footprint
than the footwear. An attachment system is provided releas-
able to anchor the traction element to the bottom surface of
footwear. Desirably, the attachment system is constructed
and arranged to restrain the traction element from undue
transverse movement with respect to the bottom surface of
the footwear.

[0017] A currently preferred attachment system includes a
forward harness system arranged to interface with a toe
portion of the footwear, and a rear harness system arranged
to interface with a rear portion of the footwear. The forward
and rear harness systems can be mechanically fastened,
adhesively bonded, or both, to the traction element. In one
preferred embodiment, a forward harness system includes a
plurality of forward straps operably arranged to adjust for a
size of inserted footwear, and can adjust to embrace a toe
portion of the footwear between the forward straps and a top
surface of the traction element. A preferred rear harness
system includes a spacer element disposed between the
traction element and an adjustable length restriction element
that can adjust to a size of an ankle area. The spacer element
can also serve to resist lateral heel motion of the wearer’s
boot with respect to the traction element. The restriction
element additionally can be arranged operably to resist
accidental extraction of a user’s foot from inside the foot-
wear.

[0018] Some traction elements, or oversoles, can include a
plurality of traction spikes to augment traction over a variety
of terrain. Certain traction enhancing appliances include
structure arranged to carry a deliberately applied masking
scent. Sometimes the traction element is employed directly
to carry the scent. In any case, a traction element is typically
constructed of a material that is softer, on an applicable
hardness scale such as Vickers, Brinell, Rockwell, Mohs,
Durometer, or Shore, compared to material forming the sole
of the footwear.

[0019] The invention is particularly useful when embod-
ied as an oversole for use in combination with a waterproof
boot, such as hip boots, or waist-high or chest-high waders.
In such case, the oversole augments traction capability of the
waterproof boot’s sole. The traction-modifying oversole is
simply associated with the sole, typically by way of an
adjustable strap system, to resist transverse motion of the
oversole relative to a traction surface the sole.

[0020] One exemplary strap system useful in application
to waders includes a forward harness system arranged to
hold a toe portion of the boot, and a rear harness system
arranged to hold a rear portion of the boot. A currently
preferred forward harness system includes a first strap
deployed near a first edge of the oversole, a second strap
deployed near a second edge of the oversole, and means
to adjust an enclosing space, in which to receive the toe
portion, defined in part by the first strap, the second strap,
and a portion of the oversole. A preferred rear harness
system includes a flexible spacer element disposed between
the oversole and an adjustable length restriction element
operable to encircle an ankle area of the boot. The restriction
element may also operate to resist accidental extraction of a
user’s foot from inside the waterproof boot. In particular,
such a restriction element is particularly beneficial in use
with rubber hip boots. Desirably, the oversole includes a
material that is deformable to conform, at least in part, to
a shape of a rock on which a wearer of the waterproof boot
may stand. Operable oversoles can be formed as prismatic
members removed from a thickness of a nonwoven material,
such as felt.

BRIEF DESCRIPTION OF THE DRAWINGS

[0021] In the drawings, which illustrate what are currently
considered to be the best modes for carrying out the inven-
tion:

[0022] FIG. 1 illustrates one embodiment of the invention
attached to a hunting boot;

[0023] FIG. 2 illustrates the embodiment of FIG. 1
mounted to a rubber hip boot;

[0024] FIG. 3 illustrates an alternative embodiment,
which utilizes laces as a portion of the connection system;
and

[0025] FIG. 4 is a cross-section through an alternative
traction element.

DETAILED DESCRIPTION OF THE ILLUSTRATED EMBODIMENTS

[0026] As illustrated in FIG. 1, one embodiment of the
invention, generally indicated at 11, can be attached to a
The traction element 13 typically is manufactured from a thick felt material, although a variety of other materials are also suitable. Woven and nonwoven materials are operable, and an arrangement including a plurality of laminated, or otherwise stacked, layers may be preferred in certain cases. It has been determined that felt made from natural and/or synthetic materials is operable. While not generally critical to operation of the invention, the felt material will typically range between about ¼ inches to about 1 inch in thickness. Traction elements 13 generally are cut from planar sheets of a felt-type of material having a substantially uniform thickness. Any operable manufacturing technique can be used to cut individual traction elements 13 from the bulk sheet, including cutting with scissors or water jet, and die punching.

A traction element 13 desirably provides a measure of cushioning from, and conformity to, elements such as a foot. A traction element 13 is softer, on an applicable hardness scale, compared to material forming a sole of a boot, such as a rubber hip wader, on which the device 11 may be worn. Traction element 13 generally enhances traction on slippery surfaces, such as mossy rocks, and can muffle or reduce noise made when a wearer steps on stones, dirt, twigs and dry sticks. In general, traction element 13 can be regarded as a removable, traction-modifying overshoe that beneficially dampens noise related to walking. In contrast, a glued-on felt sole, commonly found on certain types of waterproof boots, is regarded as being permanently attached to the boot.

In certain instances, the traction element 13 can conform to the shape of a stick to resist breaking that stick as a wearer steps on the stick. The sound generated by a breaking stick will, most likely, be considerably muffled by the traction element 13. Certain embodiments of the traction element also can muffle, or reduce, the audible noise made by a heel strike upon the ground. The invention can be embodied to be operable to reduce noise generated by running on concrete or walking through dry gravel. In most cases, a traction element 13 will present a larger size footprint to the ground than the footwear’s own footprint size. Larger sized traction elements 13 generally provide increased traction and stability to the wearer of the augmented footwear.

Several forward strap lengths 20 may be included in a forward harness arrangement, generally indicated at 22, which can be adjusted to grip firmly against the toe 23 of the boot 12 or 30, as shown in FIGS. 1 and 2. Straps 20 typically are manufactured from lengths of a fabric webbing, such as cotton or nylon webbing. However, other materials are operable as a strap, nonexclusively including sections formed from leather, rubber, and flexible composites of two or more materials. An operable forward harness can be amenable to gripping void areas adapted for draining water when a wearer moves to dry ground. A harness system desirably is rugged, to withstand abrasion from contact with ground elements, and to resist water currents.

As illustrated in FIG. 1, forward harness system 22 is arranged to embrace a forward, or toe portion, of footwear, such as hunting boot 12, between the straps 20 and the traction element 13. Straps 20 preferably are mechanically fastened to a traction element 13, such as by sewing, or riveting. Alternatively, straps 20 can be affixed to a traction element 13 by adhesive bonding techniques. However, it is further recognized that a combination of adhesive and mechanical elements may be employed to attach a strap 20 to a traction element 13.

An alternative forward harness arrangement can be made from metal, or other materials. One example of a forward harness system including a metal component is a forward harness having a wire bale adapted for reception at a welt area of a boot toe 23. Such a bale is commonly employed, for example, on certain models of crampons. As a different alternative, one or more metal bands or fabric straps can be arranged to form a pliable restraint that closes down as footwear is further inserted in a forward direction into captive engagement in the pliable restraint.

A rear harness arrangement, generally indicated at 25, may be regarded as capturing the heel of the boot 12, or a rear portion of the footwear. Rear harness arrangement 25 typically includes a spacer element 26 connected to an ankle strap 27 that desirably is adjustable in length. Ankle strap 27 can be regarded as one embodiment of an adjustable length restriction element. The restriction element 27 may also operate to resist accidental extraction of a user’s foot from inside a waterproof boot. In particular, such a restriction element 27 is particularly beneficial in use with waders having a boot-foot, such as rubber hip boot 30. In such service, it is beneficial to be able to cinch down, or to reduce in circumference, strap 27 to resist lifting of a user’s heel relative to the boot. Rear harness 25 can be affixed to a traction element 13 with the same techniques used for the forward harness 22. It is within contemplation for an alternative rear harness to include a spacer holding a toggling buckle for interface of a buckle element with a welt area at a rear of footwear, such as a boot 12.

FIG. 2 illustrates the embodiment of FIG. 1 mounted to a rubber hip boot 30. FIG. 3 illustrates an alternative embodiment, generally indicated at 40, which utilizes laces 44 as a portion of the footwear-connection system. Closing and adjusting mechanisms associated with harness arrangements operable to hold a traction element in association with a particular size footwear include buckles of all types, hook-and-loop fasteners such as Velcro™, and friction mechanisms.

FIG. 4 illustrates a cross-section through an alternative traction element, generally indicated at 50. Traction element 50 includes a plurality of traction spikes 52 arranged to protrude from a bottom surface of traction sole 13. Spikes 52 can be affixed to the traction element 50 using the illustrated mechanical interference fit, or by any other operable construction techniques known in the art of shoe-making. A plurality of traction spikes 52 can be arranged into any desired pattern distributed in any operable configuration over the footprint area defined by traction sole 13. A rivet holding a strap 20, or a spacer 26, affixed to the traction element 13 can also be arranged to operate as a spike 52.

An appliance 11 can be arranged to carry a deliberately applied masking scent. A scent-carrying pad can be attached to the appliance 11, or the traction element 13 can sometimes operate to carry the applied scent.

Appliances 11 typically are manufactured in a range of sizes to accommodate footwear of different sizes.
However, each size of appliance 11 desirably will accommodate a selected range in size of footwear. The forward and rear attachment assemblies, 22 and 25 respectively, desirably adjust in a size or a length to fit the appliance to footwear of various sizes.

[0037] While the invention has been described in particular with reference to certain illustrated embodiments, such is not intended to limit the scope of the invention. The present invention may be embodied in other specific forms without departing from its spirit or essential characteristics. The described embodiments are to be considered in all respects only as illustrative and not restrictive. The scope of the invention is, therefore, indicated by the appended claims rather than by the foregoing description. All changes which come within the meaning and range of equivalency of the claims are to be embraced within their scope.

What is claimed is:

1. An appliance for modifying the traction characteristics of footwear, comprising
   a traction element constructed of felt material; and
   an attachment system adapted releasably to anchor said traction element to the bottom surface of said footwear, said system being constructed and arranged to restrain said traction element from transverse movement with respect to said bottom surface.

2. The appliance of claim 1, wherein:
   said attachment system comprises:
   a forward harness system arranged to interface with a toe portion of said footwear; and
   a rear harness system arranged to interface with a rear portion of said footwear.

3. The appliance of claim 2, wherein:
   said forward harness system comprises a plurality of forward straps operably arranged to adjust for a size of said footwear to embrace said toe portion between said forward straps and a top surface of said traction element.

4. The appliance of claim 3, wherein:
   said rear harness system comprises a spacer element disposed between said traction element and an adjustable length restriction element.

5. The appliance of claim 1, wherein:
   said traction element comprises a plurality of traction spikes.

6. The appliance of claim 2, wherein:
   said forward harness system is mechanically fastened to said traction element.

7. The appliance of claim 2, wherein:
   said forward harness system is adhesively bonded to said traction element.

8. The appliance of claim 1, wherein:
   said appliance comprises structure arranged to carry a deliberately applied masking scent.

9. A noise modifying element, for use in conjunction with footwear having a sole, comprising:
   a traction element constructed of a material that is softer, on an applicable hardness scale, compared to material forming said sole; and
   an attachment system comprising a plurality of straps adapted releasably to anchor said traction element against undue movement with respect to said sole.

10. The traction modifying element of claim 9, wherein:
    said attachment system is constructed and arranged to restrain said traction element from transverse movement with respect to said sole.

11. The traction modifying element of claim 9, wherein:
    said traction element comprises a prismatic section of felt material.

12. The traction modifying element of claim 9, wherein:
    said attachment system comprises:
    a forward harness system arranged to hold a toe portion of said footwear; and
    a rear harness system arranged to hold a rear portion of said footwear.

13. In a waterproof boot having a sole, the improvement comprising:
   a removable, traction-modifying oversole operably associated with said sole to resist transverse motion of said oversole relative to said sole.

14. The improvement of claim 13, wherein:
    said oversole comprises a material that is deformable to conform, at least in-part, to a shape of a rock on which a wearer of said boot may stand.

15. The improvement of claim 14, wherein:
    said oversole is affixed to said boot, operably to resist transverse motion with respect to a traction surface of said boot, by way of an adjustable strap system.

16. The improvement of 15, wherein:
    said strap system comprises:
    a forward harness system arranged to hold a toe portion of said boot; and
    a rear harness system arranged to hold a rear portion of said boot.

17. The improvement of claim 16, wherein:
    said rear harness system comprises a flexible spacer element disposed between said oversole and an adjustable length restriction element operable to encircle an ankle area of said boot to resist accidental extraction of a user’s foot from inside said boot.

18. The improvement of claim 17, wherein:
    said forward harness system comprises:
    a first strap disposed near a first edge of said oversole;
    a second strap disposed near a second edge of said oversole; and
    means to adjust an enclosing space, in which to receive said toe portion, defined in-part by said first strap, said second strap, and a portion of said oversole.

19. The improvement of claim 18, wherein:
    said oversole comprises a prismatic member formed from a thickness of a nonwoven material.

20. The improvement of claim 19, wherein:
    said prismatic member comprises a section of felt mat.