DEVICE ATTACHABLE TO ITEM OF CLOTHING FOR DISPENSING MATERIAL FOR ENHANCING GRIPPING PROPERTIES OF SHOE SOLE

ABSTRACT

A wiping device may be a friable layer or an absorbent pad made of a material that can absorb and retain a fluid composition and can be attached or is attached to an item of clothing, such as a sock, shoe, compression sleeve, etc. The device is impregnated with an adhesive-type tacky substance that is released when a shoe sole is wiped against it to clean the shoe sole and allow surface dust and debris to be removed from the shoe sole. The deposited substance also forms a film or coating that remains adhered to the surface of the shoe sole to improve traction by imparting tackiness to the shoe sole.
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CROSS REFERENCE TO RELATED APPLICATION


BACKGROUND OF THE INVENTION

[0002] 1. Field of the Invention

[0003] The invention generally relates to sport shoe accessories or devices and, more specifically, to a device attachable to clothing for dispensing material for enhancing gripping properties of shoe sole.

[0004] 2. Description of the Prior Art

[0005] Many sports are played on smooth, hard surfaces, such as basketball, handball, squash, racquetball, and volleyball. The floors on which these sports are played are typically imparted a high gloss finish such as polyurethane, that renders the floors extremely smooth and tends to reduce the traction between the shoe soles of the players and the floor. Additionally, although such floors are cleaned in efforts to make the floors dust free, dust and other debris nevertheless accumulates on such floors and these contaminants tend to adhere to the bottom of shoe soles which are typically made of rubber products. These contaminants tend to coat the soles filling all of the pores and decreasing the coefficient of friction between the shoe soles and the surfaces of court, reducing the ability of players, such as basketball players, to safely make quick stops, turns or change directions. To increase traction, players frequently wipe their shoes on the damp towel to loosen the dirt and to try to physically dislodge these contaminants in order to restore some of the tackiness of the rubber soles. It is also common, when players cannot leave the court during play and wipe their shoes on the damp towel, they use their saliva to moisten the surfaces of their shoe soles. Perspiration has also been used to wipe the bottoms of the soles with the player’s hands to clean the soles of their shoes and thereby improve traction.

[0006] Devices have been used by athletes to wipe the soles of their shoes, typically in the form of fabric pads attached to the upper portions of their socks. Although such devices can absorb and retain moisture needed for cleaning shoe soles, they are primarily used to absorb sweat rather than provide damp wiping surface for court shoes. Any attempts to add moisture to these structures to create a shoe wiping surface would cause the moisture to soak into the socks causing the socks to become uncomfortably damp.

[0007] In U.S. Pat. No. 4,823,426 a shoe sole cleaning device is disclosed that includes a pad assembly having an inner cushion pad enclosed in the fabric out cover that can be attached around the footwear laces or other item worn by a user, such as a wrist band, to enable brisk rubbing of the footwear soles or other surfaces across the pad assembly of the device to remove foreign matter from such surfaces. The device does not depend on moisture and simply relies on the abrasive properties of the outer surface of the pad assembly.

[0008] U.S. Pat. No. 5,421,106 discloses a shoe sole wiping pad that is attachable to an athletic shoe, as a removable shoe string cover, provided with an upwardly facing wiping surface of suede or other suitable material. The patent suggests that the wiping surface to be made of an absorbent material although it does not indicate what type of material is intended to be absorbed, possibly moisture from the shoe sole that needs to be removed to render the sole less slippery.

[0009] It is also known to use sweat-hand-type garments that are worn around a wearer’s lower leg or ankle to absorb excess moisture before it can soak into athlete’s sock and create a moist, warm environment inside the athlete’s shoes. For example, an article of wearing apparel has been proposed to be used as a moisture-absorbing pad provided with moisture absorbent outer sleeve and a moisture barrier provided in the form of a non-moisture absorbent inner sleeve. The inner and outer sleeves are worn directly against the skin of the lower leg or ankle. The inner sleeve does not isolate the outer sleeve from the wearer’s leg. Instead, the outer sleeve extends upwardly beyond the upper edge of the inner sleeve so that it makes contact with the wearer’s skin and intercepts and absorbs sweat as it comes down from the wearer’s leg.

[0010] In U.S. Pat. No. 5,555,564 an apparatus is disclosed for cleaning a shoe sole and a method for making such apparatus. The patent discloses a shoe sole wiping pad that is sewn into the outer surface of athlete’s sock’s upper tube portion. The wiping pad is described as absorbing and retaining moisture presumably in the form of water. It has a moisture-wiping surface that is intended to remove dust and debris from the sole of an athletic shoe when the wearer wipes the sole across the pad. A moisture barrier isolates the wiping pad from the upper tube portion of the sock to prevent moisture from soaking into the sock from the wiping pad. To use the device in accordance to the disclosure in the patent the moisture retaining wiping pad is first attached to the upper tube portion of the sock. The player can then contact the sole of the shoe on one foot against the moisture retaining wiping pad on the other foot to remove the dirt and debris and improve traction between the shoe and hard playing surface. The patent also suggests removal of residual moisture from the sole of the athletic shoe, after cleaning, by wiping the sole across the dry portion of the sock, requiring a two-step procedure to avoid shipping as a result of moisture that remains on a shoe sole after brushing against the moist wiping pad. However, unless the second step of the procedure is implemented, the initial step of applying moisture to the shoe sole may actually make the soles more slippery rather than enhance the traction on a smooth hard floor surface.

[0011] U.S. Pat. No. 6,128,801 discloses a shoe sole cleaner for removing debris from the sole of the shoe that includes a base member and a closure strap extending from the base member. The construction allows the device to be secured to the shoe by means of the shoe laces to provide an exposed surface on the base member that bears a shoe sole cleaning surface. Alternatively, the shoe sole cleaner is integral to the shoe and conforms to the profile of the shoe. The patent indicates that the outer covering sheet is water absorbent and evidently contemplates that water be injected into the device for moistening it to essentially wash off or wipe the residue on a shoe sole by having the water soften and loosen the debris.

[0012] None of the above prior art teaches or suggests the use of a device that can be attached to a shoe or other item of apparel that can not only mechanically wipe off debris by applying moisture but also impart to the shoe sole a layer or
coating of a substance that provides the shoe sole surface with a requisite or desired tackiness to provide better grip on a smooth hard surface.

**SUMMARY OF THE INVENTION**

0013 Accordingly, it is an object of the present invention to provide a device attachable to an item of clothing for cleaning of the soles of shoes that does not have the disadvantages inherent in prior art devices of this type.

0014 It is another object of the present invention to provide such a device in the form of a pad that is impregnated with a releasable agent that both softens the bottom surfaces of shoe soles when wiped against the pad and also applies a tacky layer to the surface of the shoe sole.

0015 It is still another object of the present invention to provide a pad as in the previous object that is impregnated with adhesive and can be conveniently attached, for example, to the upper tubes of socks of a player, to shoe laces and/or compression sleeves and can release a cleaning and tacky substance when wiped against the soles of shoes.

0016 It is still another object of the present invention to provide an adhesive impregnated pad that enhances the gripping properties of shoe soles that are wiped against the pads without the need of any further steps to remove or eliminate a residual liquid layer or coating from the shoe soles.

0017 It is a further object of the present invention to provide an adhesive impregnated pad of the type under the discussion that is inexpensive to manufacture and is efficient and effective for cleaning bottoms of shoe soles and enhancing their gripping properties.

0018 It is still a further object of the present invention to provide an adhesive impregnated pad that is easy and convenient to use.

0019 It is a further object of the present invention to provide an adhesive impregnated pad that can prolong the tackiness and gripping properties of shoe soles without the need of the player to leave the court and can be used during play.

0020 It is an additional object of the present invention to provide an adhesive impregnated pad as in the previous objects that can be applied to any garment worn during play, including socks, the uppers of the shoes, compression sleeves, sweat bands or the like.

0021 It is still an additional object of the present invention to provide an adhesive impregnated pad that uses a mechanical as well as a chemical approach to increasing tackiness while enhancing the gripping properties of shoe soles instead of merely using a moisturizer, such as water, to physically moisten and wipe off dirt, dust or debris.

0022 It is a further additional object of the invention to provide a pad that includes a reservoir for receiving a composition that, when applied to a shoe sole, creates a film coating that prolongs the tackiness of a shoe sole on a smooth hard surface by controlled activation of a composition by means of pressure-sensitive nano-particles or controlled release of the composition through a semi-permeable membrane.

0023 It is yet an additional object to provide a device that includes a detachable semi-solid layer that can be attached to an item worn by an athlete and that provides an outer surface that can transfer a film to a shoe sole that enhances the tackiness of the sole when it contacts a hard playing surface.

0024 In order to achieve the above objects, as well as others that will become apparent herein, and after, device in accordance with the present invention may be made of a material that can absorb and retain a grip enhancing composition and can be attached or is attached to an item of clothing, such as a sock, shoe, sleeve, etc. The pad is impregnated with an adhesive-type tacky substance that is released when a shoe sole is wiped against the pad so that the impregnated substance is transferred to the shoe sole to apply a coating or thin film layer of the grip enhancing composition to the shoe sole while allowing surface dust and debris to be removed from the shoe sole. The substance, however, remains adhered to the surface of the shoe sole to improve traction by imparting tackiness to the shoe sole.

**BRIEF DESCRIPTION OF THE DRAWINGS**

0025 Those skilled in the art will appreciate the improvements and advantages that derive from the present invention upon reading the following detailed description, claims, and drawings, in which:

0026 The FIG. 1 is a pictorial view of a player wearing socks with a plurality of grip enhancing pads in accordance with the invention provided on each of the player’s socks;

0027 FIG. 2 is a cross-sectional view of a first embodiment of a grip enhancing device in the form of a friable semi-solid layer of material for transferring a film or coating to a shoe sole for enhancing its tackiness on a smooth hard surface; and

0028 FIG. 3 is a cross-sectional view of a second embodiment of a grip enhancing device in the form of a pad that includes a reservoir of tackiness enhancing composition, which may be sponge or other absorbent material and a semi-permeable membrane for controlled release of the composition when brushed or wiped against a shoe sole.

**DESCRIPTION OF PREFERRED EMBODIMENT**

0029 Referring now specifically to FIG. 1, a sock 10 is provided with a plurality of grip enhancing devices in the form of absorbent pads 12a-12c: on the upper tube of each of the socks worn by the player. The socks may be made of any suitable material, such as wool or a synthetic fiber. One or more of the pads may be attached to other items worn by the player including, but not limited to a sock, shoe, sweat bands and tight spandex compression sleeves commonly used to help keep muscles warm and prevent injuries. The pads 12a-12c are secured to the outside of the sock upper sleeves and positioned so that an athlete can rinse his/her foot to make contact between the sneaker sole and the pad or pads 12a-12c in order to effectively wipe the shoe sole against the impregnated pads. The sizes and/or shapes of the pads 12a-12c and the specific method of applying or attaching the pads to the sock 10 is not critical and any suitable approach may be used, including the one disclosed in U.S. Pat. No. 5,555,564. Other examples of known methods for applying accessory layers to items of clothing are disclosed in the following U.S. Pat. Nos. 6,810,534; 6,401,256; 6,385,778; 6,128,801; 6,115,838; 5,950,259; 5,784,721; 5,771,495; 5,603,332; 5,555,564; 5,421,106; 5,421,034; 5,307,522; 4,675,915; 1,225,354 and British Patent No. 508,478.

0030 An important feature of the present invention is that the pads 12a-12c in accordance with one embodiment of the invention, for example, are impregnated with a material that has the ability to clean and physically remove surface contaminants, such as dust and debris from the bottom of shoe soles but also to impart a tackiness by leaving a thin layer or
coating of a material substance on the bottom of a shoe sole after wiping. The tackiness enhances the gripping properties of the shoe sole. Any composition can be used for this purpose. For example, a suitable composition is disclosed in co-pending U.S. patent application Ser. No. 13/162,026, which is incorporated into this application as if fully set forth herein. Thus, a coating material dispensed by a patch in accordance with the present invention may comprise a film former; an adhesive; a tackifier; and a solvent for separating the film former, adhesive and tackifier prior to application to the shoe sole surface and causing same to bond into a tacky film after application and evaporation of the solvent. The coating material may further include nano-sized particles comprising organic emulsion polymerized cross-linked polymer. The adhesive is preferably a pressure sensitive adhesive (PSA) and a film former preferably comprises a melting resin having a melting point selected to be within a temperature range of 65-125°F.

[0031] Examples of other substances suitable for impregnating the pads 12a-12c are set forth in the following U.S. Pat. Nos. 6,322,876; 5,571,617; 5,709,340; 5,508,313; 5,495,801; 5,502,108; 4,994,322; 4,080,348; 3,519,585 and 3,400,421. Other materials that may be used include the following products made available from Slipp-Nott Corp. located in Los Angeles, Calif.; S-N Grip™ and H20IP™.

[0032] The use of the chemical substance that enhances tackiness not only physically dislodges and removes dirt off the bottom of the shoe but leaves a residual layer or coating of the substance that continues to exhibit enhanced tackiness and gripping properties on the shoe soles with continued play. The pads in accordance with the invention can be attached to a sweat band that wraps around the shin, is attached and secured to the garment such as a sock by any suitable means, such as VELCRO® fasteners. Preferably, the pads are refillable or replaceable, so once the pad dries up or becomes depleted, it can be replaced or the liquid or semi-liquid substance can be injected or applied to the pad so to re-impregnate the pad and restore to its original youthfulness.

[0033] While the pad in accordance with the present invention has been described as being applied or attached to the upper tubes of socks, it will be evident that the pads can also be made conveniently available to players or users in numerous other ways including, but not limited to, by attaching the pads to laces, compression sleeves and even to the upper of both shoes so that the pad on one shoe can be used for wiping the other shoe.

[0034] As suggested above, the presently preferred embodiment has been described in relation to as an absorbent pad that can releasably retain a composition that, when rubbed or applied to the bottom of the shoe sole can leave a deposit film or coating that can enhance tackiness on a smooth hard surface. However, the present invention also contemplates the use of other delivery systems, with different degrees of advantage. Importantly, however, with each delivery system the net effect should be that the user can swipe the sole of a shoe that he or she is wearing against the pad to remove at least part of the debris or contaminants from the bottom of the shoe sole and additionally to leave a thin film or coating that can be effective for providing enhanced and prolonged grip or tackiness with continued play.

[0035] In one embodiment an absorbent patch or pads applied to an item of clothing has an adhesive around its perimeter or outside edges to allow it to be attached to an item of clothing. An absorbent material in the center is impregnated with the desired composition, of the type, for example, disclosed in U.S. patent application Ser. No. 13/162,026, or similar material. These materials are dissolved in a low volatility solvent so that the composition can be dispensed over extended period of time without drying up. The absorbent material may be covered with a semi-permeable membrane that prevents the material in the patch from being dispensed when not in use but allows the composition to be dispensed when swiped or rubbed against the shoe sole. Application of alcohol that can also swell the rubber in the shoe to increase tackiness. Application of alcohol to a tacky/adhesive mixture, in addition to its own properties, could also provide desired enhanced gripping properties and, in some cases, activate the composition when first used.

[0036] As understood in the art and for purposes of this application and the disclosure therein, the term “moisture” is defined as involving or containing water in solution. Thus, a pad activated with acetone, alcohol or a solvent would not have “moisture”. Such liquid materials would not need a “moisture” barrier to protect the wearer. The use of alcohol and other solvents, however, when applied to a rubber sole will, as indicated, swell the rubber and this would, additionally, provide enhanced grip.

[0037] A feature of the invention is that the material absorbed in the pad does not contain water, which would normally moisten the dirt and debris and remove some of that by mechanically cleaning the bottom of the shoe. However, the present invention contemplates application of a coating or film that creates or enhances grip beyond simply cleaning off the bottom surface of the shoe sole, without the need to be moistened. Materials suitable for this purpose are compositions that stick better to the shoe sole rather than to itself, thus materials that are adhesive rather than cohesive.

[0038] While absorbent pads 12a-12c are shown in a presently preferred embodiment, it will be clear to those skilled in the art that other delivery systems may be used, with different features of advantage, as to be described below.

[0039] Turning to FIG. 2, a device in a form of a patch 14 in accordance with another embodiment of the present invention is illustrated in cross-section. Here, the garment 16 is depicted as providing a surface to which the patch 14 may be attached. Any suitable and conventional method of attachment can be used, such as stitching or adhesive. An adhesive layer is shown that may be used to attach the patch 14 to a garment 16, such as a central adhesive layer 18, or in the alternative, a peripheral adhesive layer 20 may be used that extends about the periphery of the patch 14. A solid or semi-solid layer 22 is supported by the adhesive layer(s). The adhesive layers are initially protected by removable release liner 24 that can be removed by pulling it from the layer 22 prior to play, as suggested by arrow 26. Once the liner 24 is removed, with this embodiment, each time the patch 14 is used to rub against the bottom of the shoe sole some of the friable solid or semi-solid layer 22 is depleted and the pad 14 can be used until the layer 22 is completely depleted, at which time it needs to be replaced.

[0040] Referring to FIG. 3, a further embodiment of the device in accordance with the invention is shown and designated by the reference numeral 28. The device 28 is, again, intended to be secured to the surface of a garment 16 by means of a central adhesive layer 30 or a peripheral adhesive layer 32. Secured to the adhesive layer 32 is tackiness-enhancing composition containing layer or compartment 34 that is filled with suitable tackiness enhancing material of the type under
discussion and disclosed, for example, in U.S. patent application Ser. No. 13/162,026. The end remote from the adhesive layers 30, 32 may be open or generally perforated to allow the material to flow in a direction generally away from the adhesive layer. In accordance with the embodiment shown, a semi-permeable membrane 38 controls or limits excessive flow of the material 36, and a removable release liner 24 may be used with the device shown in Fig. 2. If desired, an optional pull out tab or strip 40 may be provided that can be easily removed by pulling at one end or the other as suggested by arrows 42a or 42b. The device shown in Fig. 3, therefore, bears some similarities to trans-dermal patches that permit controlled and limited dispensing of a liquid material. After the removable release liner 24 is peeled off as suggested by the arrow 26, the semi-permeable membrane 38 can dispense fluid when rubbed against the bottom surface of the shoe sole. If the removable release liner 24 is initially used with the device 28, the pull out tab or strip 40 may not be necessary as both of these perform substantially the same or similar function, namely preventing inadvertent and/or excessive flow of the fluid onto the shoe sole surface against which the device 28 is swiped or rubbed.

[0041] In all of the embodiments in accordance with the present invention, the objective is the same, namely to provide at least some physical removal of debris or contaminants by means of a mechanical or rubbing operation followed by the deposition of a layer, film or coating of a composition suitable for enhanced tackiness and, therefore, the gripping properties of the shoe sole. The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly, all such modifications and equivalents may be resorted to, falling within the scope of the invention.

What claimed is:

1. A device for enhancing the gripping properties of shoe sole comprising:
a patch having front and rear surfaces;
attachment means for attaching said patch to a surface if an item of clothing such that said rear surface of said patch abuts against said surface of said item of clothing and exposes said front surface of said patch, said front surface of said patch being arranged to allow wiping or rubbing same against the bottom surface of a shoe sole and application of a thin film or coating of a material that enhances the tackiness between the shoe sole and a hard playing surface.
2. A device as defined in claim 1, wherein said patch is in the form of an absorbent pad.
3. A device as defined in claim 1, wherein said attachment means comprises stitching.
4. A device as defined in claim 1, wherein said attachment means comprises adhesive.
5. A device as defined in claim 4, wherein said adhesive is a central adhesive layer within the periphery of said patch.
6. A device as defined in claim 4, wherein said adhesive is a strip of adhesive extending about said periphery of said patch.
7. A device as defined in claim 1, wherein said patch comprises a layer of friable material.
8. A device as defined in claim 7, wherein said patch is formed of a semi-solid material to enhance friability.
9. A device as defined in claim 1, further comprising a release liner removably attached to said front surface of said patch to protect said front surface prior to use.
10. A device as defined in claim 1, wherein said patch includes a layer for containing a material that is fluid and can be selectively released through said front surface.
11. A device as defined in claim 10, further comprising control means for controlling the degree to which said material can be dispensed through said front surface when an object such as a shoe sole is brushed or wiped against said front surface.
12. A device as defined in claim 11, wherein said control means comprises a semi-permeable membrane.
13. A device as defined in claim 12, further comprising a removable pull out strip of non-permeable material between said front surface and said semi-permeable membrane to prevent disposal of said fluid material through said semi-permeable membrane prior to use.
14. A device as defined in claim 13, wherein said strip includes at least one tab that extends beyond the periphery of said patch that can be gripped and pulled out to allow said fluid material to be dispensed through said semi-permeable membrane.
15. A device as defined in claim 10, wherein said patch layer comprises an absorbent layer.
16. A device as defined in claim 10, wherein said patch layer comprises a compartment for receiving and retaining said fluid material.
17. A device as defined in claim 1, wherein said coating material dispersed by said patch comprises:
a film former;
an adhesive;
a tackifier; and
a solvent for separating said film former, adhesive and tackifier prior to application to the shoe sole surface and causing same to bond into a tacky film after application and evaporation of said solvent.
18. A device as defined in claim 17, wherein said coating material further comprises nano-sized particles comprising organic emulsion polymerized cross-linked polymer.
19. A device as defined in claim 17, wherein said adhesive is a pressure sensitive adhesive (PSA).
20. A device as defined in claim 17, wherein said film former comprises a melting rosin having a melting point selected to be within a temperature range of 65-125°F.

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