An improved sock with a circumferential flap secured thereto which when worn in combination with footwear, prevents the introduction of foreign particulate such as pebbles into the hiking boots and other footwear. The sock is made from cotton, wool, synthetic material or a combination thereof. The flap is preferably made from a material that is liquid impermeable and is vapor permeable. The flap is secured to the sock by loomning, stitching, buttons, or by complimentary materials on both the flap and the sock. In operation, the flap is lowered to a position where it circumferentially covers the top of the shoe or hiking boot thereby preventing environmental hazards from entering therein. In some embodiments, additional means are used to secure the flap to the footwear such as VELCRO, buttons, and a drawstring.
SOCK WITH ENVIRONMENTAL HAZARD PROTECTION

[0001] This application claims priority from U.S. Pat. application Ser. No. 60/232,319, filed on Sep. 13, 2000, which is hereby fully incorporated by reference.

BACKGROUND OF THE INVENTION

[0002] The invention relates to an improved sock. More specifically, the present invention relates to an apparatus for protecting the user’s foot and the interior portion of the footwear from environmental hazards.

[0003] A common problem associated with footwear is the entry of particulate into the footwear. This is an especially irritating problem for hikers and others who enjoy outdoor activities. For instance, pebbles from a hiking trail can be kicked up and lodged within the boots of hikers, thereby causing discomfort to the hiker and necessitating their immediate removal. When traveling in a group, delays associated with rocks or other items can inconvenience the others if they wait until the rocks are removed, or the removal of the rocks can cause the afflicted hiker to fall behind should the group choose not to wait. Naturally, the hiker may simply choose to continue in spite of the discomfort he or she may be experiencing but this is a less than ideal alternative.

[0004] In addition, entry of particulate into footwear can present problems in other sports as well as workplace activities. For example, tennis players on clay courts do not have adequate means to prevent clay from being kicked up and entering their shoes so they often will change socks between sets causing delays in game play and television broadcasts. Furthermore, individuals working around hazardous materials, such as semiconductor clean room technicians, construction workers, machinists, and firemen use unnecessarily cumbersome protective footwear as they require protection from accidental exposure to the harmful materials.

[0005] Conventionally, there are products such as gaitsers that attempt to prevent the introduction of environmental particulate into footwear such as the one illustrated in FIG. 1. One particular gaiter is described in U.S. Patent No. 5,887,359 assigned to Salomon S. A. This gaiter is made from nylon or other water impermeable material and is placed on one end on the upper portion of a hiking boot, and at the other end, on the shin of the user. It is affixed to the leg of the user by a zipper that secures the gaiter along the user’s shin and by a buckle that extends over the sole of the shoe in order to prevent the gaiter from slipping off the leg. While such a gaiter may provide a water-resistant shield from environmental hazards such as snow, these gaiters are cumbersome to affix and to wear, and as a result, are impracticable for hiking and for other uses. Furthermore, because of the manner in which gaitsers are fixed to the legs of the user, pebbles or other small particulate may become trapped within them and enter the boots of the user.

[0006] Accordingly, it should be appreciated that there remains a need for a less cumbersome, user-friendly apparatus for preventing particulate from entering footwear, such as a hiker’s boots, to allow such a user to enjoy hiking or other activities without the inconvenience and discomfort described above.

SUMMARY OF THE INVENTION

[0007] The present invention is embodied in a sock for use with an article of footwear comprising a top portion having an outer surface, and a flap circumferentially secured to the outer surface of the top portion, where the flap is movable to a position covering the footwear to prevent environmental hazards from entering it. In some embodiments the sock is made from cotton, wool, nylon, other synthetic materials, or a combination thereof. The flap is secured to the sock by conventional integrated hooking techniques, stitches, buttons, or by complimentary securable materials found on the flap and the sock. The current invention is applicable to sporting activities, as well as to safety in the industrial or manufacturing workplace. For example, the current invention is effective in sealing work boots against metal shavings, hot rivets, hazardous liquids, and any other foreign matter.

[0008] In some embodiments, the flap is secured to the footwear solely by the elastic material within the flap, while in other embodiments, the flap is secured to the boot by a drawing, VELCRO, or buttons. In other embodiments, the flap is made from a water impermeable material that prevents the introduction of water into the boot or shoe of the user and allows water vapor to exit from the shoe.

[0009] In another embodiment, a sock with environmental hazard protection for the inner portion of an article of footwear is provided. A heel portion of the sock is configured to envelop the foot of the user and to substantially fit within the footwear. The sock also includes a top portion that is coupled to the heel portion and extends outwards from the footwear. The top portion is configured to circumferentially envelop the shin of the user and includes a flap circumferentially secured thereto that is downwardly extendable over the footwear to retard the entry of particulate into the inner portion of the footwear.

[0010] The invention is also embodied in a system for preventing environmental hazards from entering the boot of a user comprising a boot, a sock, and sealing means affixed to the sock which are movable to prevent environmental hazards from entering the boot. The sealing means includes complimentary buttons affixed on the flap and on the sock, complimentary securable material such as VELCRO, buttons, or a drawing circumferentially incorporated into the flap.

[0011] Other features and advantages of the present invention will become apparent from the following description of the exemplary embodiments, taken in conjunction with the accompanying drawings, which illustrate, by way of example, principles of the invention.

DESCRIPTION OF THE ACCOMPANYING FIGURES

[0012] FIG. 1 is a side view of a prior art gaiter;
[0013] FIG. 2 is a side view of a sock according to the current invention with a flap in an inactivated state;
[0014] FIG. 3A is a side view of a sock placed within an article of footwear according to the current invention with a flap in an inactivated state;
[0015] FIG. 3 is a side view of the sock in FIG. 3A placed within an article of footwear and with the flap in an activated state;
FIG. 4A is a side view of the sock of FIG. 3A further including a drawstring to secure the flap on the sock to the footwears;

FIG. 4B is a side view of the sock of FIG. 4A with the flap in an activated state;

FIG. 5A is a side view of the sock of FIG. 3A further including buttons to secure the flap on the sock to complimentary buttons on the footwears;

FIG. 5B is a side view of the sock of FIG. 5A with the flap in an activated state;

FIG. 6A is a side view of the sock of FIG. 3A further including a first securing material on the flap of the sock securable to a second securing material on the footwear;

FIG. 6B is a side view of the sock of FIG. 6A with the flap in an activated state;

FIG. 7A is a side view of the sock of FIG. 3A further including a logo placed thereon;

FIG. 7B is a side view of the sock of FIG. 7A with the flap in an activated state;

FIG. 8A is a side view of the sock of FIG. 3A further including a module coupled to the flap of the sock; and

FIG. 8B is a side view of the sock of FIG. 8A with the flap in an activated state.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

As illustrated in FIG. 2, the current invention is embodied in a sock 5, such as an athletic sock with a heel portion 9 and a top portion 13. The heel portion is configured to snugly, but comfortably, envelop the foot of the user from the toes to above the ankle, while the top portion circumferentially wraps around the lower shin 25 of the user (it will be recognized that socks may come in various lengths and typically extend from above the ankle to beyond the knee of the user if desired). Preferably, the top portion incorporates an elastic material for securing the sock to the shin of the user. The sock may be made from cotton, wool, a synthetic material or a combination thereof depending on the desired application. One preferred sock material and method of manufacture is described in U.S. Pat. No. 5,450,630, which is hereby incorporated by reference. The sock also includes a circumferential flap 17 secured to the top portion of the sock by looming or stitching or equivalent techniques, and as seen in FIG. 2, coextends upwards with the top portion (although it will be recognized that the flap and the top portion may be of different lengths). Preferably the flap is affixed at a point at least as high as the highest point of the boot and is made from a similar material as the top portion. Alternatively and as described below, the flap may be securably attachable or detachable by use of a complimentary material such as by VELCRO® or by buttons. The point at which the flap is secured may be adjusted according to foot size of the user as well as the height of the boot. In one embodiment, the flap is at least six inches long and is permanently connected to the outside of the top portion of the sock approximately four inches above the heel portion (high enough to fold down over a typical hiking boot).

In applications where the user may be subjected to liquid particulate, the flap 17 of the sock 5 is preferably made from material that is elastic, lightweight, water-resistant, and dust-proof (a skilled artisan will also appreciate that the entire sock may be made from this same material). One such material is available under the trademark GORETEX. Another material is disclosed in U.S. Pat. No. 5,244,716 assigned to Poirier P.L.C., which is hereby incorporated by reference and is impermeable to liquid water but is permeable to water vapor. In addition, it is preferred that the sock material have a high thermal permeation quotient to permit heat to escape from the inside of the boot while preventing the introduction of foreign matter.

With reference to FIG. 3A, the sock 5 is placed within an article of footwear 21 in the same manner as a conventional sock so that the top portion of the sock 13 rests on the shin of a user 25. In operation (see FIGS. 3A and 3B), the flap 17 is pulled down by the user in the z direction away from the top portion to a point where it covers the top of the footwear. In this position, the sock prevents pebbles, burrs, twigs, metal shavings, dust, and other particulate from entering the boot of the user. In addition, the utilized sock material may be such that if the user wearing the sock missteps, while crossing a mountain stream, the amount of water and other particulate entering the boot is minimized. The current invention is particularly effective when used in connection with hiking boots that are substantially waterproof.

With reference to FIGS. 4A and 4B, an alternative embodiment is illustrated where in addition to the elastic material used to secure the flap 17 to the article of footwear 21 as in FIG. 3B, the flap includes a circumferential passage 29 stitched therein that is configured to house a drawstring 33. When in the activated state in FIG. 4B, the flap is turned downwards in the z direction away from the top portion so that the drawstring envelops the upper portion of the footwear and can be secured circumferentially to provide the footwear with additional protection from environmental particulate and to prevent the flap from moving off the footwear.

With reference to FIGS. 5A and 5B, yet another embodiment is shown where the flap 17 includes a plurality of flap buttons 37 positioned so that they are securable to a plurality of matching footwear buttons 41 placed on the article of footwear 21. When the flap is turned downwards in the z direction away from the top portion 13, the flap buttons are secured to the footwear buttons so that the flap retards the entry of particulate into the footwear and to prevent the flap from moving off the footwear.

With reference to FIGS. 6A and 6B, an embodiment is illustrated where the flap 17 includes a securably detachable (and attachable) material 45, such as VELCRO®, positioned to join with a complimentary detachable material 49, placed on the article of footwear 21. When the flap is turned downwards in the z direction, the securably detachable material is coupled to the complimentary detachable material so the flap is positioned to prevent environmental hazards from entering the footwear and to further secure the flap to the footwear. While the preferred material on the flap and the footwear is VELCRO® due to its widespread availability and ease of use, other materials with similar securing/detaching properties may be used. It will also be appreciated
that small strips of the detachable material may be used in lieu of complete strips circling the top portion of the footwear.

[0032] As seen in FIG. 7A, the flap 17 of the sock 5 includes a logo 53 that is concealed when the flap is in an inactivated state, and is revealed as seen in FIG. 7B when the flap is directed in the z direction into an activated state. Alternatively, the logo may be placed at the top portion 17 of the sock so that it is visible when the flap is extended downwards. With this arrangement, the sock could be produced in one of several neutral colors to allow the sock to “disappear” into the boot or in bright colors with brand names or club logos displayed on the outside surface for marketing purposes.

[0033] As seen in FIGS. 8A and 8B, the flap 17 of the sock 5 may also include an additional module 57 such as a zippered pouch for housing keys or other small items or metallic reflectors that may serve as a locating device to aid search parties in case of an accident. Preferably, the module only becomes accessible to the user when the flap portion is turned in the z direction away from the top portion 13 and is coupled around the upper portion of the footwear 21.

[0034] It will, of course, be understood that modifications to the exemplary embodiments will be apparent to those skilled in the art. For example, different materials may be used for the flap and the sock. In addition, other mechanisms may be used to secure the flap to the sock and to secure the flap to the boot. Consequently, the scope of the present invention should not be limited by the particular embodiments discussed above, but should be defined only by the claims set forth below and equivalents thereof.

I claim:

1. A sock for use with footwear comprising:
   a top portion having an outer surface; and
   a flap circumferentially securable to the outer surface of said top portion, wherein said flap is movable to a position covering the footwear to prevent environmental hazards from entering the footwear.

2. The sock of claim 1 wherein said sock is made from nylon.

3. The sock of claim 1 wherein said sock is made from cotton.

4. The sock of claim 1 wherein said flap is loomed onto said top portion.

5. The sock of claim 1 wherein said flap is secured to said flap by stitching.

6. The sock of claim 1 wherein said flap is secured to said flap by complimentary materials on said sock and on said flap.

7. The sock of claim 1 wherein said flap is made from a water impermeable material.

8. The sock of claim 7 wherein said flap is made from a vapor permeable material.

9. The sock of claim 1 wherein said flap is secured to the boot by an elastic material.

10. The sock of claim 1 wherein said flap coextends with said top portion.

11. The sock of claim 1 wherein said flap further comprises a plurality of buttons configured to receive a plurality of buttons mounted to secure said flap to the footwear.

12. The sock of claim 1 wherein said flap further comprises an elastic drawstring to secure said flap to the footwear.

13. The sock of claim 1 wherein said flap further comprises a module accessible to the user when said flap covers the footwear.

14. The sock of claim 12 wherein said module is a zippered pouch configured to provide storage.

15. The sock of claim 12 wherein said storage module is a reflector.

16. The sock of claim 1 wherein said flap further comprises a logo on said top portion that is exposed when said flap extends downwards to cover the footwear.

17. The sock of claim 1 wherein said flap further comprises a logo on said flap that is exposed when said flap covers the footwear.

18. A system to prevent a user from being subject to environmental hazards comprising:
   an article of footwear;
   a sock; and
   sealing means securably affixed to the circumference of said sock and movable to couple with said footwear to prevent environmental hazards from entering said footwear.

19. The system of claim 18 wherein said sealing means comprises a flap circumferentially secured to said sock and including detachable means for detachably securing said flap to said footwear.

20. A sock to provide environmental hazard protection for the inner portion of an article of footwear comprising:
   a heel portion configured to envelop the foot of the user and to substantially fit within the footwear;
   a top portion coupled to said heel portion and extending outwards from the footwear and configured to circumferentially envelop the shin of the user; and
   a flap circumferentially secured to said top portion by looming and configured to downwardly extend over the footwear to prevent particulate from entering the inner portion of the footwear.

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