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(54) **PROTECTIVE ICE HOCKEY SOCK**

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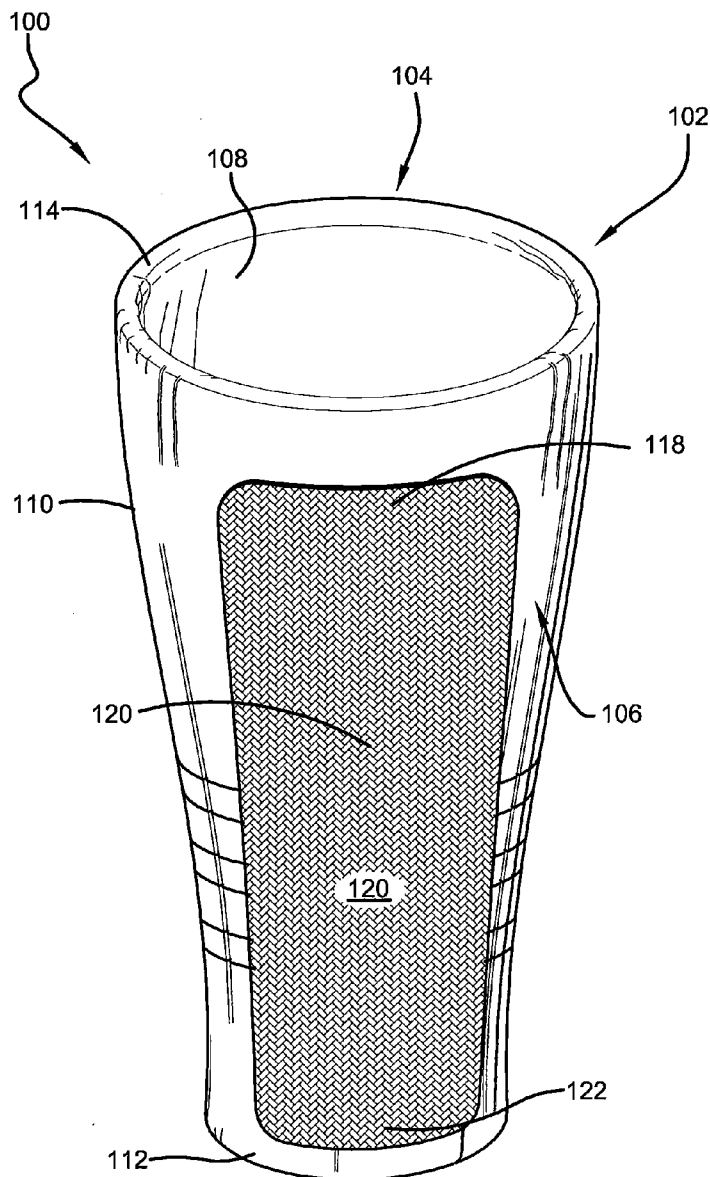
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(57) **ABSTRACT**

Related U.S. Application Data

(60) Provisional application No. 61/580,451, filed on Dec. 27, 2011.

A protective article of clothing for preventing cuts and injury to a lower leg of an ice hockey player is provided. The protective article of clothing comprises a sock element and a protective barrier element for protecting a back of the lower leg.



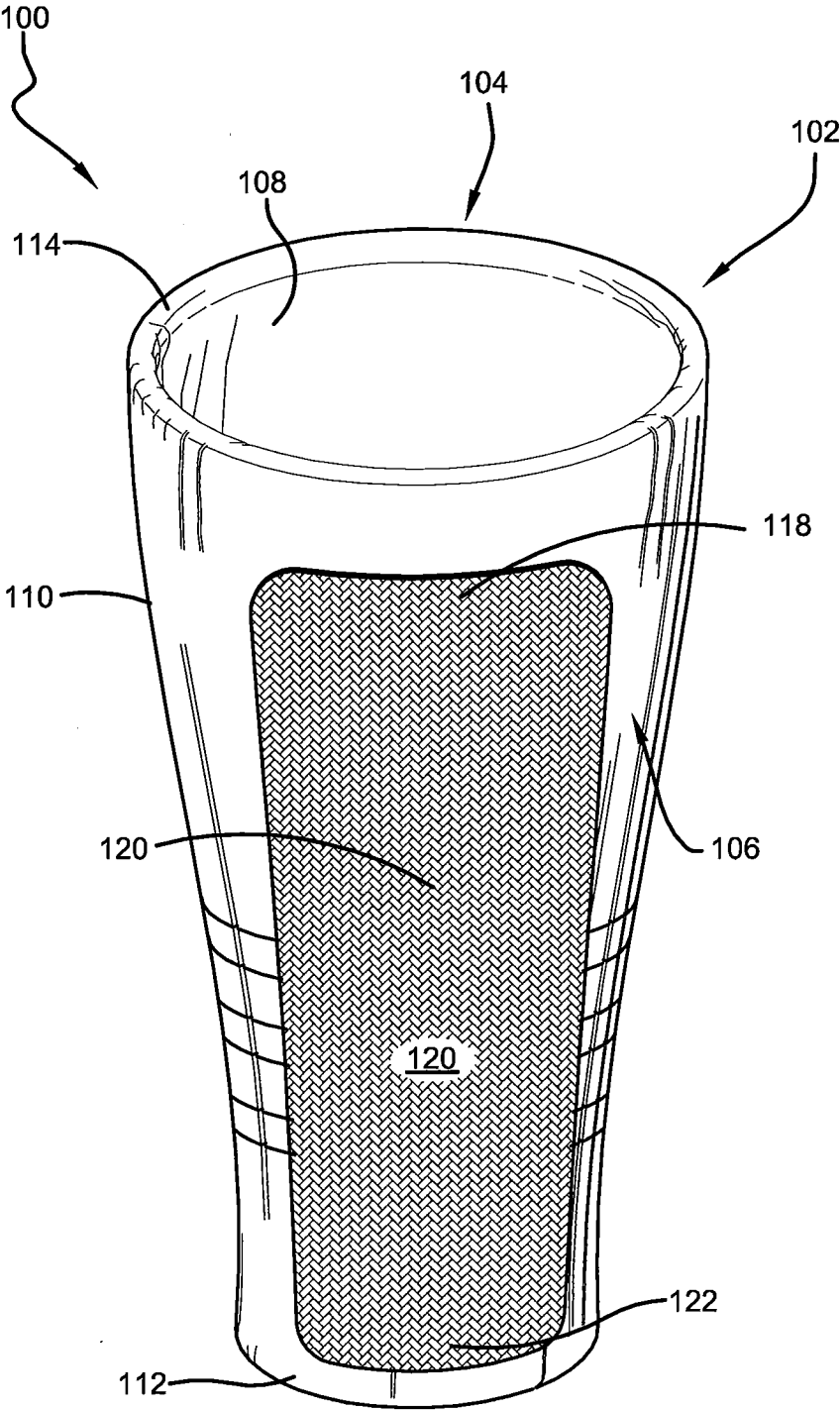


FIG. 1

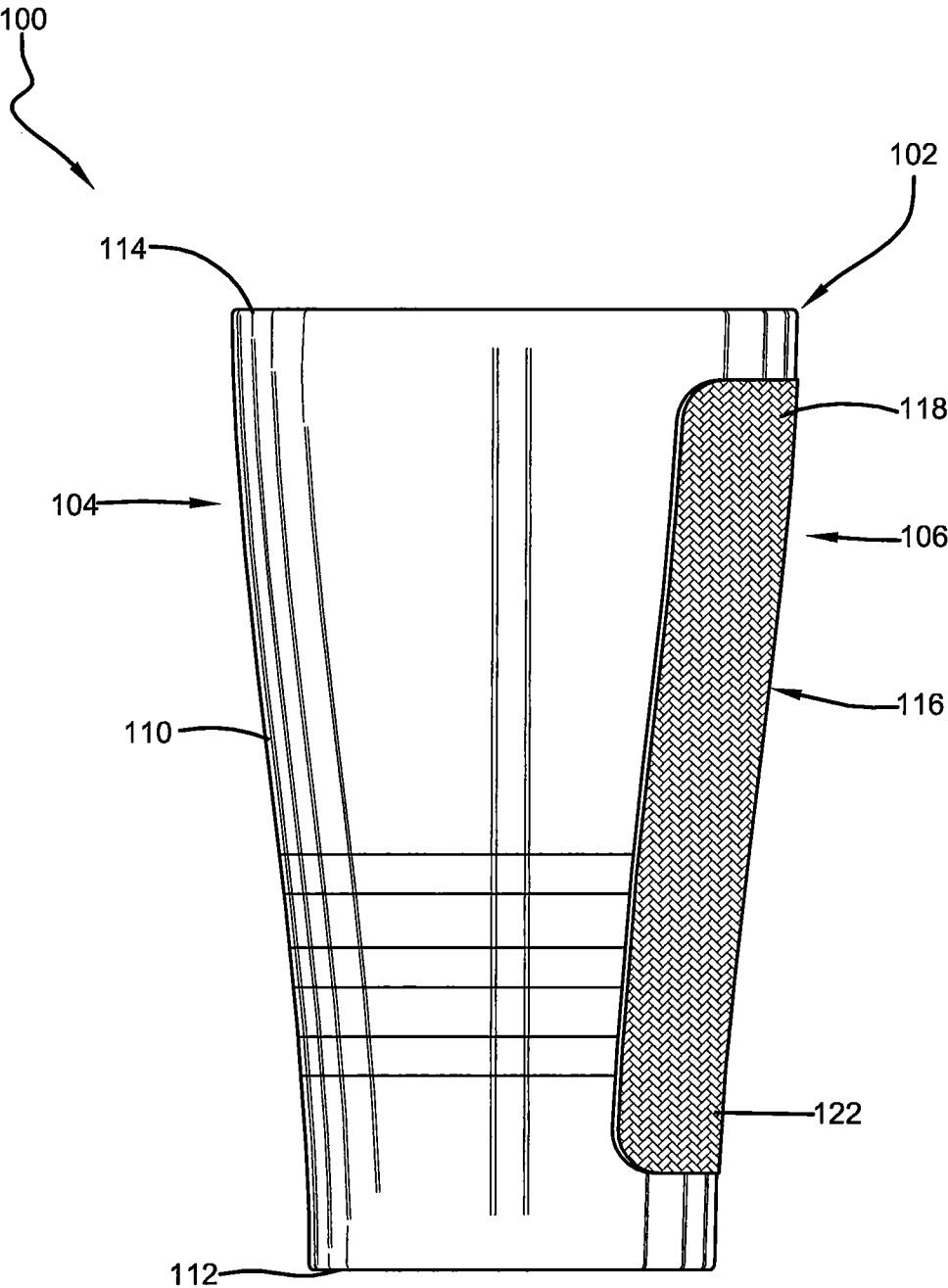


FIG. 2

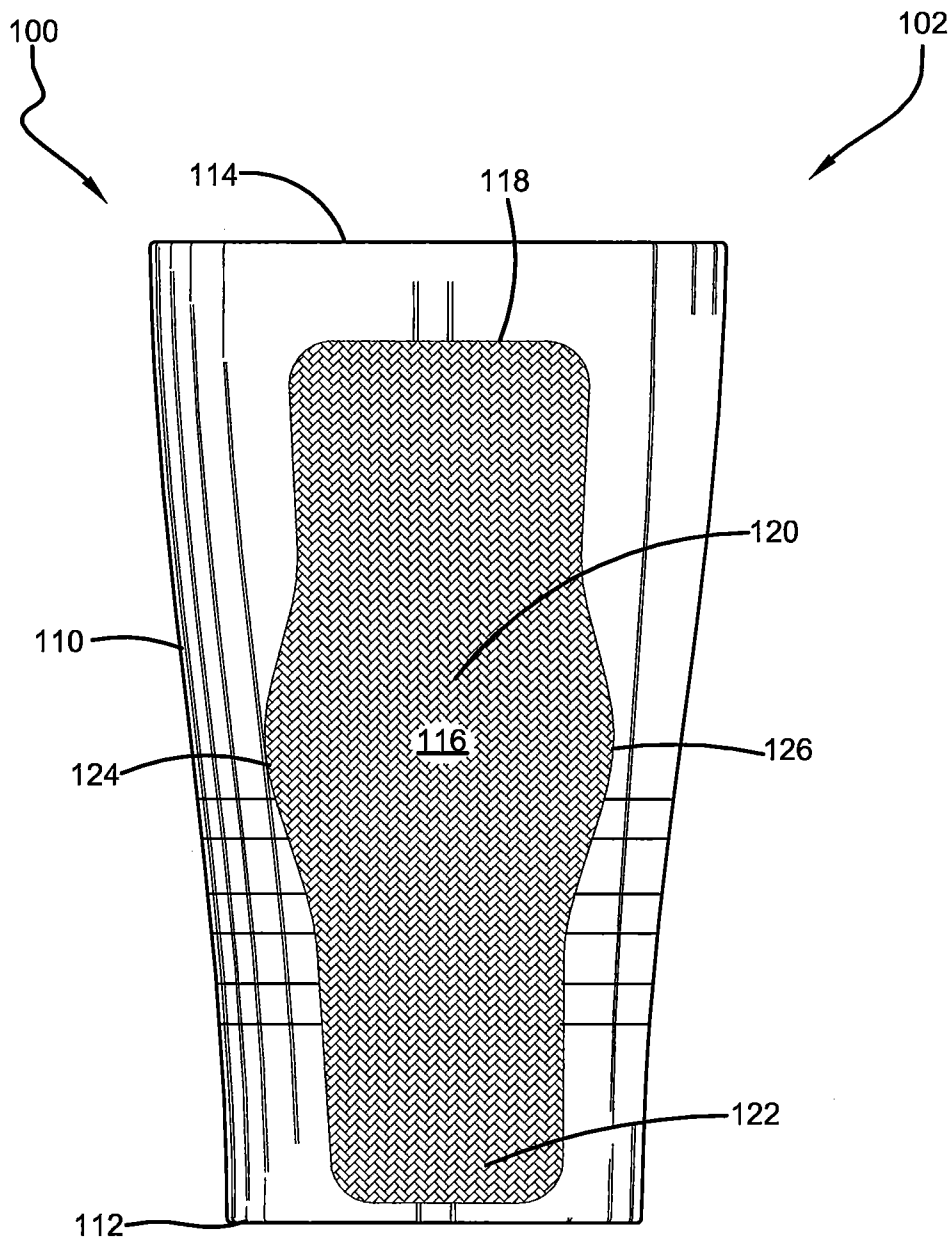


FIG. 3

PROTECTIVE ICE HOCKEY SOCK

CROSS-REFERENCE

[0001] This application claims priority from Provisional Patent Application Ser. No. 61/580,451 filed Dec. 27, 2011.

FIELD OF THE INVENTION

[0002] This invention pertains generally to a protective sock for skaters, and more particularly to a protective sock for protecting a back of a lower leg of an ice hockey player from a penetrating or an abrading injury.

BACKGROUND

[0003] Shin guards used by ice hockey players serve as the primary protective equipment for protecting a player's lower leg from injury. However, traditional shin guards only cover the front and sides of the leg leaving the calf exposed and vulnerable to lacerations from skate blades and hockey stick blades. The Achilles heel and the back of the knee are especially vulnerable to injury despite the protection afforded by the shin guards. A laceration to these areas may cause permanent and debilitating injuries to leg muscles, nerves, ligaments, and tendons. Such injuries often endanger the player's ability to play hockey again, especially on a professional level thereby depriving the player from a livelihood.

[0004] Consequently, there is a need for a protective article of clothing that provides additional protection to the back of the lower legs of an ice hockey player that are not protected by existing protective hockey equipment. The present invention discloses a protective barrier element integratable into a traditional hockey sock that covers the exposed calf and Achilles heel, shielding the area from skate blade lacerations. While protecting the back of the lower leg, the protective article of clothing still allows the player to maintain uninhibited mobility when worn. Additionally, the protective article of clothing works in conjunction with existing shin pads allowing the entire lower leg to be protected from skate and hockey stick blade injuries.

SUMMARY

[0005] The following presents a simplified summary in order to provide a basic understanding of some aspects of the disclosed invention. This summary is not an extensive overview, and it is not intended to identify key/critical elements or to delineate the scope thereof. Its sole purpose is to present some concepts in a simplified form as a prelude to the more detailed description that is presented later.

[0006] The subject matter disclosed and claimed herein, in one aspect thereof, comprises a protective article of clothing that covers the lower leg of an ice hockey player from a knee to a heel. The protective article of clothing comprises a sock element that fits over and encapsulates a shin guard, and a protective barrier element highly resistant to penetrating injuries that is integrated into a back of the sock element. Additionally, the protective article of clothing may further comprise a variety of designs that match hockey team colors and logos.

[0007] Furthermore, the protective article of clothing maintains flexibility so that the ice hockey player's mobility remains unimpeded while still functioning as protective equipment. While still permitting the shin guard to protect a front of the lower leg, the protective barrier element provides flexible protection from lacerations to a previously unpro-

tected back of the lower leg. Specifically, the protective barrier element substantially covers an Achilles tendon, a calf muscle, and a back of the knee.

[0008] To the accomplishment of the foregoing and related ends, certain illustrative aspects are described herein in connection with the following description and the annexed drawings. These aspects are indicative of the various ways in which the principles disclosed herein can be practiced and all aspects and equivalents thereof are intended to be within the scope of the claimed subject matter. Other advantages and novel features will become apparent from the following detailed description when considered in conjunction with the drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 illustrates a perspective view of a protective article of clothing for protecting a lower leg of an ice hockey player in accordance with the disclosed architecture.

[0010] FIG. 2 illustrates a side perspective view of the protective article of clothing in accordance with the disclosed architecture.

[0011] FIG. 3 illustrates a rear perspective view of the protective article of clothing in accordance with the disclosed architecture.

DETAILED DESCRIPTION

[0012] Reference is now made to the drawings, wherein like reference numerals are used to refer to like elements throughout. In the following description, for purposes of explanation, numerous specific details are set forth in order to provide a thorough understanding thereof. It may be evident, however, that the novel embodiments can be practiced without these specific details. In other instances, well known structures and devices are shown in block diagram form in order to facilitate a description thereof. The intention is to cover all modifications, equivalents, and alternatives falling within the spirit and scope of the claimed subject matter.

[0013] Referring initially to the drawings, FIGS. 1-3 illustrate a protective article of clothing 100 for covering the lower leg of an ice skater. Traditional ice hockey socks typically fit over a lower leg and a shin guard designed to protect a front of the lower leg. The traditional ice hockey socks are generally tight fitting flexible garments that extend from a heel to above a knee with a foot remaining un-encapsulated. While the shin guard is held in place by the ice hockey sock, a back of the lower leg remains unprotected as the sock is typically manufactured from a stretchable, but easily penetrated material such as cotton.

[0014] The protective article of clothing 100 comprises a sock element 102 and a protective barrier element 116. The sock element 102 is typically an ice hockey sock comprising a front portion 104 and a back portion 106. However, the sock element 102 may also comprise any other lower leg covering usable as lower leg protection, such as but not limited to an ice skating sock, a sports sock, and the like. The protective barrier element 116 is integrated into the back portion 114 of the sock element 102. The sock element 102 generally encapsulates the lower leg of an ice hockey player from the heel to above the knee. The sock element 102 is typically manufactured of a stretchable natural or synthetic material such as cotton, nylon, rib-knit fabric, polyester, and the like, or of any other material or combination thereof known to one of skill in the art.

[0015] The sock element **102** further comprises an inside **108**, an outside **110**, a base **112**, and a top **114**. The base **112** comprises an opening for sliding the foot through and generally fits into a hockey skate boot. While ice hockey socks generally are designed to fit over a regular sock and do not encapsulate a foot, an embodiment where the sock element **102** further comprises a foot encapsulating portion (not shown) is contemplated as well.

[0016] The protective barrier element **116** for protecting an Achilles tendon, a calf, and a back of a knee is generally a flexible protective material that is cut and/or laceration resistant. The protective barrier element **116** is generally constructed of Kevlar® or Vectran®, however any other suitable durable flexible material such as but not limited to plastic, high-tensile polymer, thermoplastic polyethylene fiber, polypropylene fiber, high-density microfiber, polyester fiber, and the like, as is known in the art may be used without affecting the overall scope of the invention. The protective barrier element **116** may comprise either a single layer of material or multiple layers of material approximately between $\frac{1}{32}$ and $\frac{1}{4}$ inches in thickness.

[0017] As illustrated in FIG. 3, the protective barrier element comprises a top portion **118**, a middle portion **120** and a bottom portion **122**. The protective barrier element **116** may be generally rectangular in shape tapering approximately between 12 and 30 inches in height and approximately between 2 and 6 inches in width, so as to extend from the base **112** to the top **114** of the sock element **102**. However, the shape of the protective barrier element **116** may be ovoid, conical, or irregularly shaped as well. For example, the protective barrier element **116** further comprises a first side **124** and a second side **126**. The first side **124** and the second side **126** may further extend outward laterally in the middle portion **120**, for better protecting the calf. Furthermore, the first side **124** and the second side may extend to overlap or underlap the shin guard affording complete circumferential protection to the lower leg. Similarly, either the top portion **118** and/or the bottom portion **122** may be the widest point as well.

[0018] The protective barrier element **116** is attachable to the back portion **106** of the sock element **102**. The protective barrier element **116** is generally stitched into or onto the back portion **106** of the sock element **102** on the inside **108** or the outside **110**. The protective barrier element **116** may be also attached by adhesive, radio-frequency welding, hot glue pressing, and the like, or by any other method as is known in the art without affecting the overall scope of the invention. Furthermore, the protective barrier element **116** may be used as an insert so that it is removable locatable within sock element **102**, such as in between the sock material or within a pocket (not shown) in the back portion **106** of the sock element **102**.

[0019] Alternatively, the protective barrier element **116** may further comprise a flexible coating. As a coating, the flexible barrier element **116** would be a highly durable cut-resistant fabric or coating sewn on or adhered to an existing traditional ice hockey sock.

[0020] Other variations are within the spirit of the present invention. Thus, while the invention is susceptible to various modifications and alternative constructions, a certain illustrated embodiment thereof is shown in the drawings and has been described above in detail. It should be understood, however, that there is no intention to limit the invention to the specific form or forms disclosed, but on the contrary, the

intention is to cover all modifications, alternative constructions, and equivalents falling within the spirit and scope of the invention, as defined in the appended claims.

[0021] The use of the terms “a” and “an” and “the” and similar referents in the context of describing the invention (especially in the context of the following claims) are to be construed to cover both the singular and the plural, unless otherwise indicated herein or clearly contradicted by context. The terms “comprising,” “having,” “including,” and “containing” are to be construed as open-ended terms (i.e., meaning “including, but not limited to,”) unless otherwise noted. The term “connected” is to be construed as partly or wholly contained within, attached to, or joined together, even if there is something intervening. Recitation of ranges of values herein are merely intended to serve as a shorthand method of referring individually to each separate value falling within the range, unless otherwise indicated herein, and each separate value is incorporated into the specification as if it were individually recited herein. All methods described herein can be performed in any suitable order unless otherwise indicated herein or otherwise clearly contradicted by context. The use of any and all examples, or exemplary language (e.g., “such as”) provided herein, is intended merely to better illuminate embodiments of the invention and does not pose a limitation on the scope of the invention unless otherwise claimed. No language in the specification should be construed as indicating any non-claimed element as essential to the practice of the invention.

[0022] Preferred embodiments of this invention are described herein. Variations of those preferred embodiments may become apparent to those of ordinary skill in the art upon reading the foregoing description. The inventor expects skilled artisans to employ such variations as appropriate, and the inventor intends for the invention to be practiced otherwise than as specifically described herein. Accordingly, this invention includes all modifications and equivalents of the subject matter recited in the claims appended hereto as permitted by applicable law. Moreover, any combination of the above-described elements in all possible variations thereof is encompassed by the invention unless otherwise indicated herein or otherwise clearly contradicted by context.

What is claimed is:

1. A protective article of clothing for covering a lower leg of a user, the protective article of clothing comprising:
 - a sock element configured to encapsulate the lower leg from a heel to above a knee, wherein the sock element fits over a shin guard worn on the lower leg of the user and comprises a front portion and a back portion; and
 - a protective barrier element, wherein the protective barrier element is attachable to the back portion of the sock element.
2. The protective sock of claim 1, wherein the protective barrier element is a flexible cut-resistant fabric.
3. The protective sock of claim 1, wherein the protective barrier element is a flexible cut-resistant coating.
4. The protective sock of claim 3, wherein the flexible coating comprises a cut-resistant synthetic material.
5. The protective sock of claim 4, wherein the cut-resistant synthetic material comprises approximately between 10 and 100 percent Kevlar® or Vectran®.
6. A protective article of clothing for covering a lower leg of an ice hockey player, the protective article of clothing comprising:

- a sock element configured to encapsulate the lower leg from a heel to a knee, wherein the sock element fits over a shin guard worn on the lower leg and comprises a front portion, a back portion, an inside, an outside, a base, and a top; and
 - a protective barrier element comprising a high-tensile polymer, wherein the protective barrier element is removably attached to the back portion of the sock element.
7. The protective article of clothing of claim 6, wherein the protective barrier element is stitched into the inside of the back portion of the sock element.
 8. The protective article of clothing of claim 6, wherein the protective barrier element is stitched into the outside of the back portion of the of the sock element.
 9. The protective article of clothing of claim 6, wherein the protective barrier element is hot glued onto the back portion of the sock element.
 10. The protective article of clothing of claim 6, wherein the protective barrier element extends along a length of the sock element from the base to the top of the sock element.
 11. The protective article of clothing of claim 10, wherein the protective barrier element protects at least one of an Achilles tendon, a calf, and a back of a knee.
 12. The protective article of clothing of claim 6, wherein the protective barrier element is approximately between 1/2 and 1/4 inches in thickness.
 13. The protective article of clothing of claim 6, wherein the protective barrier element is approximately between 12 and 30 inches in height and approximately between two and six inches in width.
 14. A protective sock for covering a lower leg of an ice hockey player, the protective sock comprising:

- a sock element configured to encapsulate the lower leg from a heel to a knee, wherein the sock element fits over a shin guard worn on the lower leg and comprises a front portion, a back portion, an inside, an outside, a base, and a top; and
 - a flexible protective barrier element comprising a top portion, a middle portion, and a bottom portion, wherein the flexible protective barrier element is stitched onto the back portion of the sock element.
15. The protective sock of claim 14, wherein the flexible protective barrier element extends laterally toward the front portion of the sock element so as to overlap or underlap a shin guard.
 16. The protective sock of claim 14, wherein the flexible protective barrier element comprises a laceration resistant material.
 17. The protective sock of claim 16, wherein the flexible protective barrier element comprises single or multiple layers of the laceration resistant material.
 18. The protective sock of claim 16, wherein the laceration resistant material comprises at least one of the following: Kevlar®, Vectran®, thermoplastic polyethylene fiber, polypropylene fiber, high-density microfiber, or polyester fiber.
 19. The protective sock of claim 14, wherein the flexible protective barrier element is wider at the top portion than at the bottom portion.
 20. The protective sock of claim 14, the flexible protective barrier element is wider in the middle portion than at the top portion or the bottom portion.

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