



US 20080244801A1

(19) **United States**

(12) **Patent Application Publication**
RUSSO

(10) **Pub. No.: US 2008/0244801 A1**

(43) **Pub. Date: Oct. 9, 2008**

(54) **SPORT SOCK WITH INTEGRAL SHIN GUARD**

Publication Classification

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(51) **Int. Cl.**
A41D 13/00 (2006.01)
A43B 17/00 (2006.01)
A41F 11/00 (2006.01)
(52) **U.S. Cl.** 2/22; 2/240; 2/239; 2/311; 2/338

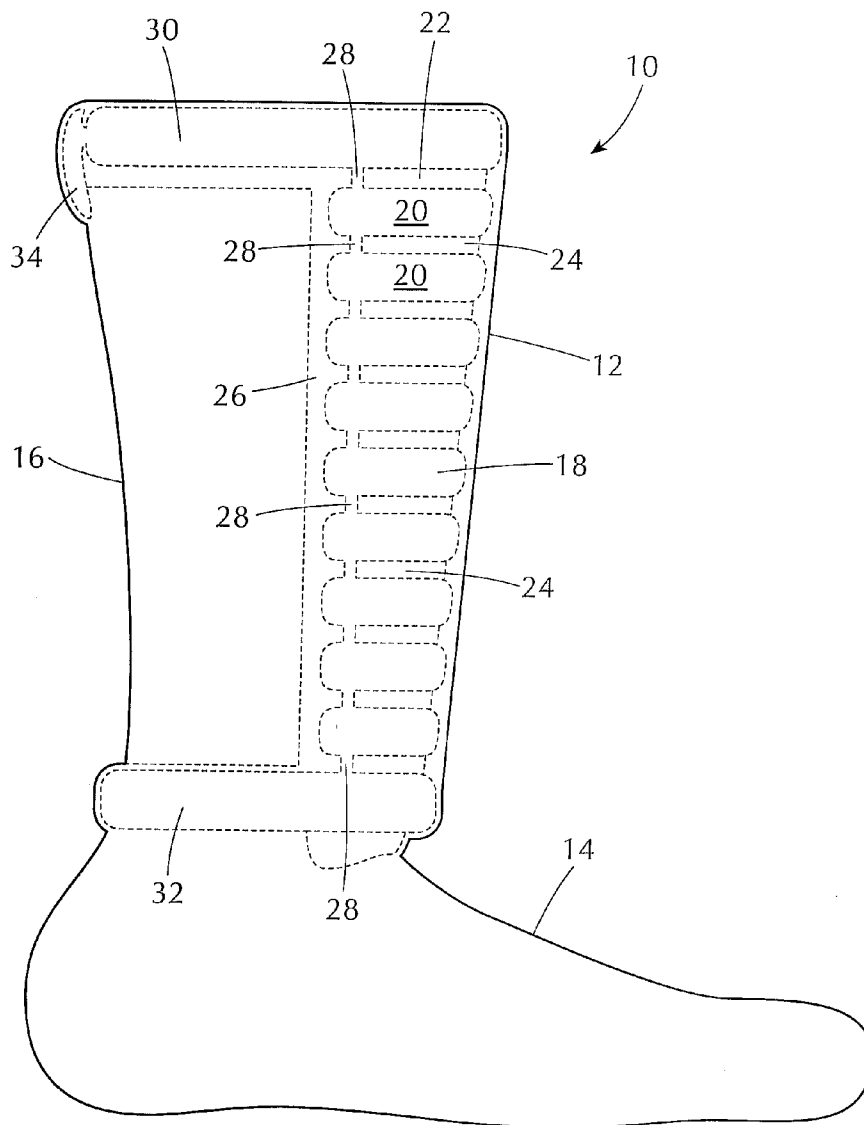
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(57) **ABSTRACT**

A sport sock with an integral shin guard has a series of inflatable bladder elements positioned next to and affixed to an inner surface of the sock material to overlie the shin of a wearer and perform a guard function when inflated. The bladder elements are inter-connected and may be connected to a small, manually-operated pump that is located at the rear upper portion of the sock. A pair of upper and lower inflatable straps are affixed to the sock material and encircle the leg. The straps are also inter-connected to the bladder element so that they inflate and deflate in coordination with the bladder elements and retain the sock on the leg when inflated.

(21) Appl. No.: **11/695,633**

(22) Filed: **Apr. 3, 2007**



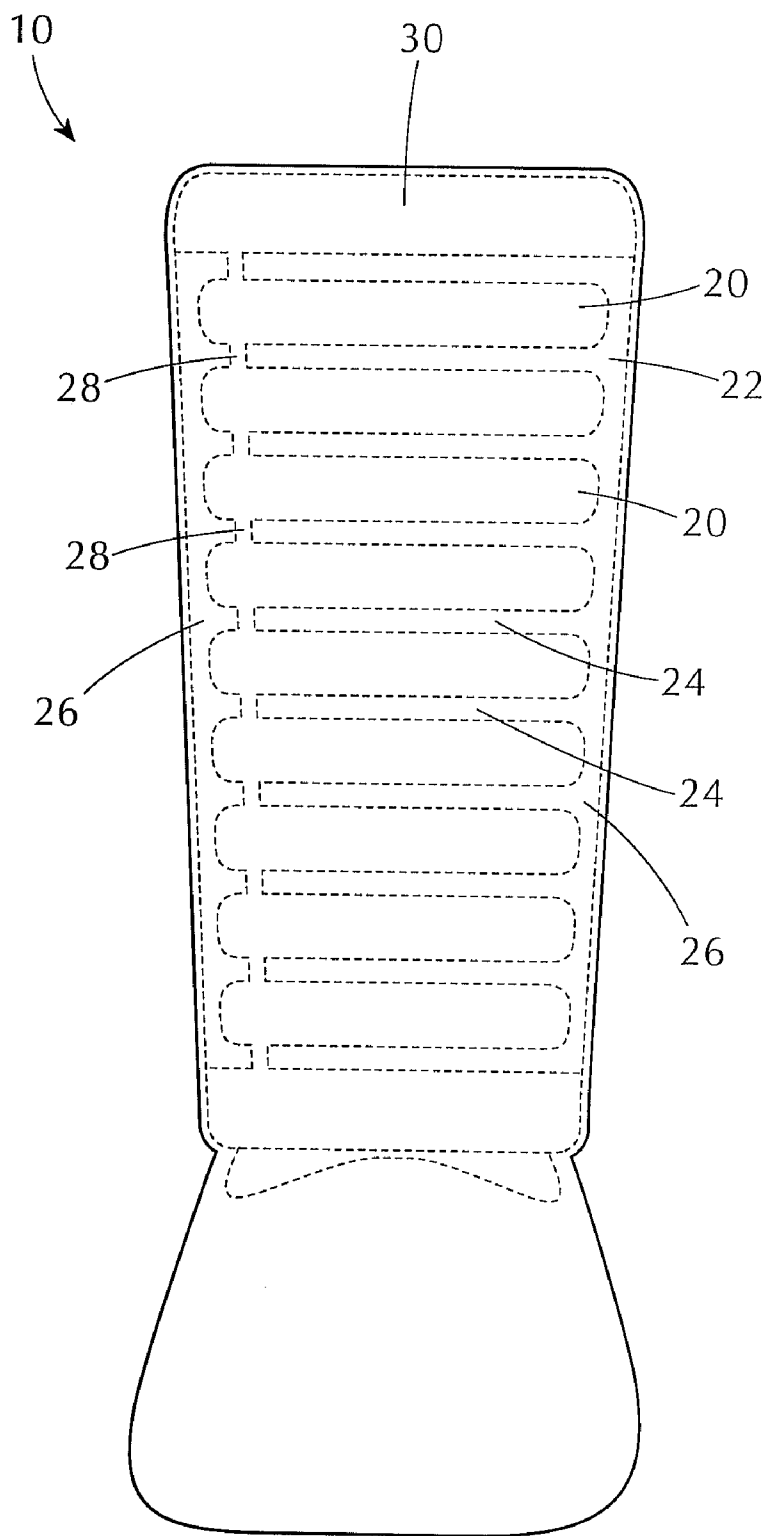


FIG. 2

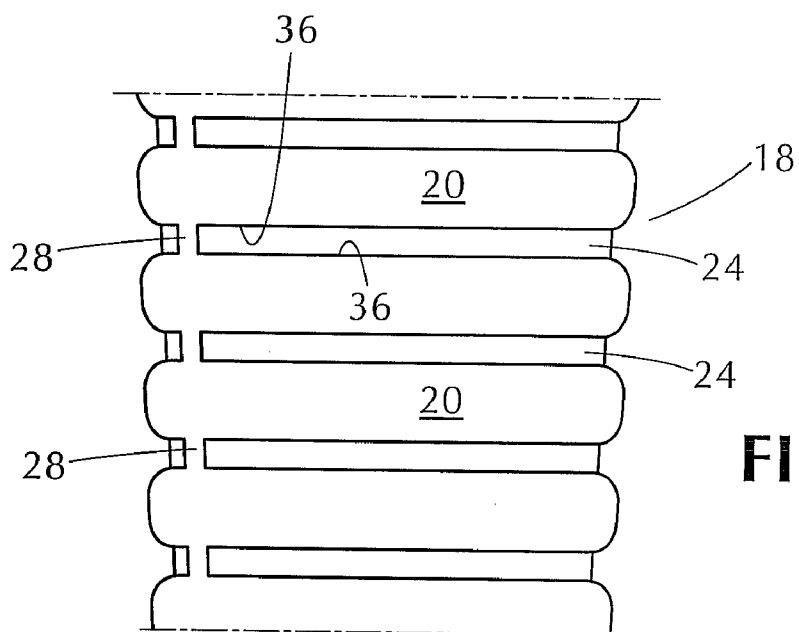


FIG. 2A

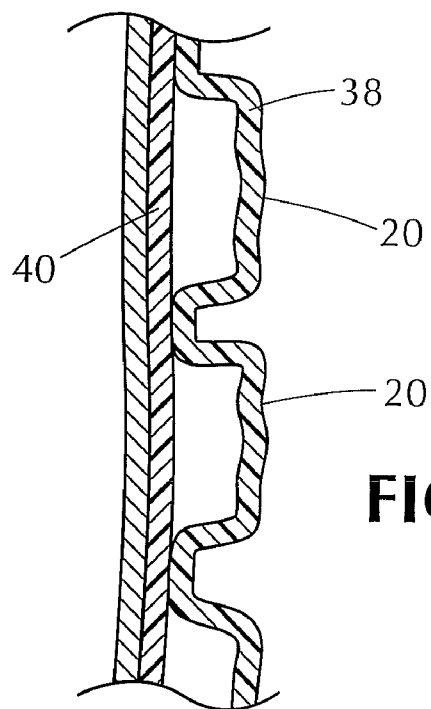


FIG. 5

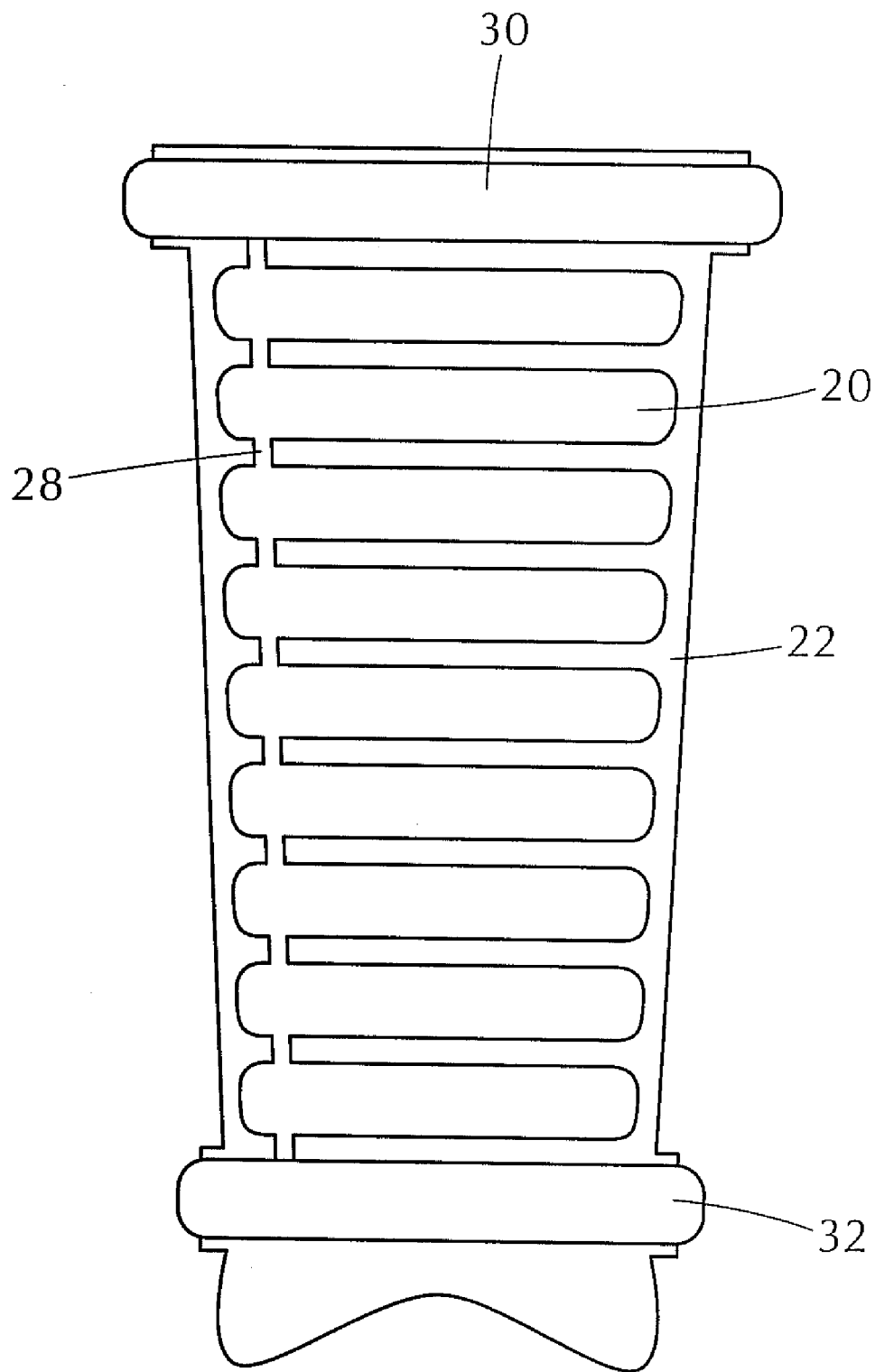


FIG. 3

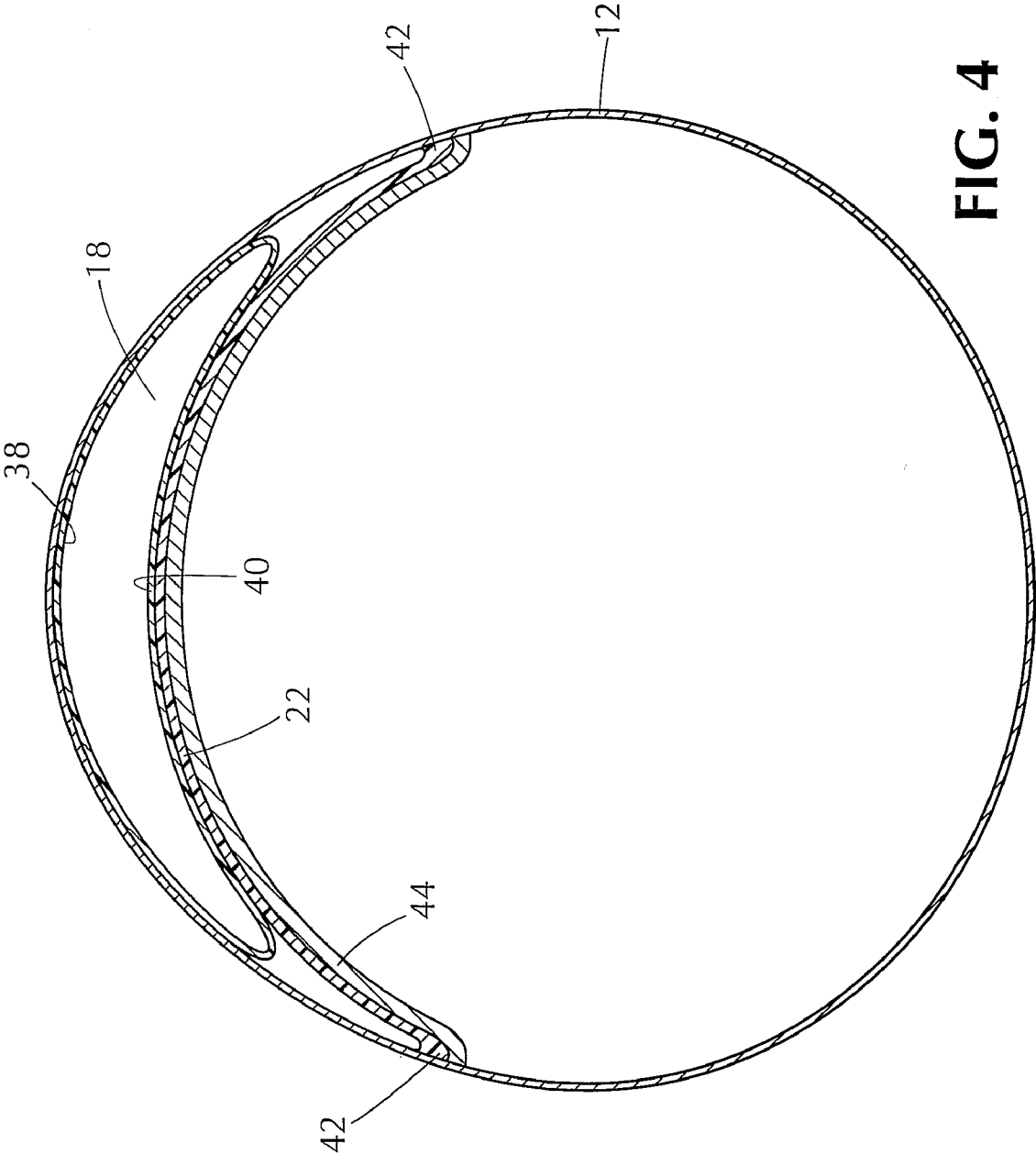


FIG. 4

SPORT SOCK WITH INTEGRAL SHIN GUARD

[0001] The present invention relates to a new and improved sport sock with an internal and integral shin guard, with particular applicability for soccer and lacrosse players and players of other sports where protection for the shin area of the leg is appropriate.

BACKGROUND OF THE INVENTION

[0002] The use of protective gear on the legs of sports players, such as soccer players, is well known. The fast and furious action associated with soccer, including kicking actions and player contact, subjects the player's legs, and particularly the shin portions thereof, to repeated contact and potential injury. Accordingly, shin guards are a conventional item worn by the players.

[0003] The shin guards in current use are typically contoured pad-like elements of a tough rigid material, such as plastic, which are placed directly against the shins and often secured thereto by straps. The player's socks covers the guards.

[0004] The construction of such guards can leave much to be desired. Their rigid construction, required to afford the necessary protection, often does not allow a comfortable fit to the leg. In addition, the guards are cumbersome to put on and remove. They are prone to movement when the sock is put on over the guard and require removal of the sock to be taken off. In addition, they are also subject to rotation under the sock when the player is active, leaving portions of the shin area unprotected, and also drop down on the leg, resting on the top of the foot, making it uncomfortable to run or otherwise flex the foot.

[0005] It is accordingly a purpose of the present invention to provide a new and improved combined sock and shin guard construction that eliminates the deficiencies of the prior art. In particular, it is a purpose of the present invention to provide a combined sock and shin guard that is more user-friendly, is readily adaptable and conformable to a particular user's leg, and does not require use of separate guard and sock elements.

BRIEF DESCRIPTION OF THE INVENTION

[0006] In accordance with the foregoing and other objects and purposes, a sock and shin guard of the present invention comprises a sock with an integral inflatable shin guard. The shin guard is mounted to an interior surface of the sock; the sock may have a further interior layer between the shin guard and the user's leg.

[0007] The shin guard is of a inflatable construction, preferably with a plurality of generally horizontally-extending inflatable band-like elements joined together at their lateral edges. Such a construction allows the sock to be donned with the guard in an un-inflated condition, whereby maximum flexibility of the construction is available. When put on the guard is inflated, providing the required superior impact resistance. The individual bands of the guard may be curved along their lengths to further allow conformance to the leg. The degree of inflation provides control over the fit and allows the rigidity of the guard to be customized to the desires of the player.

[0008] The guard portion may further be provided with an integral pump/release valve, allowing the inflatable elements

to be inflated as desired once the apparatus is donned and deflated for adjustment or for sock removal. With the bands deflated the sock/guard can be easily raised and lowered on the leg, thus facilitating both donning and removal.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] A fuller understanding of the present invention will be obtained upon consideration of the following detailed but nonetheless illustrative embodiments of the present invention, when reviewed in association with the annexed drawings, wherein:

[0010] FIG. 1 is a side elevation view of the combined sock and shin guard apparatus in accordance with the invention;

[0011] FIG. 2 is a front elevation view thereof;

[0012] FIG. 2a is detail view of an alternative construction for the guard element;

[0013] FIG. 3 is a front elevation view of the guard construction;

[0014] FIG. 4; is a representative cross-section view of the sock and guard; and

[0015] FIG. 5 is a detail sectional elevation view of an inflatable element of the guard in the un-inflated configuration.

DETAILED DESCRIPTION OF THE INVENTION

[0016] With reference to the Figures, combined sock and shin guard 10 comprises an overlying sock 12 of generally conventional configuration, including a foot-enveloping portion 14 and an upper sleeve-like portion 16 adapted and constructed to fit about the lower leg and shin of the wearer. The sock may be of any appropriate material, including cotton, wool or synthetic fabrics or blends thereof as known in the art. The height of the portion 16 is such that it preferably covers substantially the entire shin portion between the foot and the knee. Internal shin guard element 18 is positioned within the sock to overlie the shin portion of the leg, generally defined as the front part of the leg below the knee.

[0017] Shin guard portion 18 is formed from a plurality of inflatable band-like elements 20 extending generally horizontally to extend across and over the shin when the sock is fully donned. Each of the band-like elements 20 may be formed of an appropriate tough but flexible material, such as vinyl, plastic or rubber. Each of the inflatable elements 20 is in the form of a bladder, capable of expanding and becoming firm when pressurized. The individual element bladders are connected together by air passageways 28, which allow the entire guard to be inflated or deflated as a unit. As may be seen in FIG. 5, it is contemplated that the inflatable elements and the air passageways 28 may be formed as a unit from two sheets 38, 40 of the appropriate material, selectively heat-sealed or otherwise bonded together in a manner to define the inflatable elements and air passageways therebetween, the outer sheet 38 having sufficient area to accommodate the inflation.

[0018] The inflatable elements 20 and the passageways 28 may be supported and further joined together by a matrix 22 which may, for example, be a fabric or mesh layer to which the inflatable elements 20 and passageways are mounted, such as by an appropriate adhesive. The lower end of the matrix may be contoured to efficiently follow the contour of the ankle when the sock is in place. The matrix includes interstitial portions 24 between the inflatable elements 20, maintaining alignment of the inflatable elements while providing flexibility for the construction, even when the elements

20 are fully inflated. In addition to forming a backing surface for the inflatable elements 20, the matrix may also comprise a vertically-extending pair of edgewise portions 26, extending beyond the ends of the inflatable elements 20, which can further facilitate affixation of the shin guard portion 18 to the sock 12. Alternatively, the backing matrix may comprise the inner sheet 40 from which the inflatable elements 20 are formed. In addition to providing a support mechanism for the inflatable elements 20, the matrix 22 can serve as a further cushioning surface between the inflatable elements and the wearer's skin, and may improve comfort thereof, especially when in the form of a fabric having appropriate characteristics, such as a wicking function, to remove perspiration from the skin.

[0019] As depicted in FIG. 2A, the shin guard portion 18 may also be constructed as a series of the inflatable elements 20 joined together in a "venetian blind" type of assembly, where the connecting matrix 22 consists solely of individual interstitial portions 24, extending between the adjacent, horizontal edges 36 of the inflatable elements. In such a construction the interstitial portions 24 are preferably laminations of the sheet elements from which the inflatable elements are constructed, although separate elements, such as pieces of fabric, can be joined to the edges of the adjacent inflatable elements.

[0020] The sock and shin guard 10 may further include integral strap means to retain the sock, and particularly the leg portion 16 thereof, on the leg of the wearer with the shin guard in proper position. Preferably the straps are in the form of inflatable rings. Accordingly, upper inflatable strap 30 and lower inflatable strap 32 are provided at the upper end of the sock and at the lower margin of the sock leg portion 16, respectively. As with the inflatable guard elements 20, both the upper and lower straps may be formed as inflatable bladder-like elements, in this case fully encircling the leg. Additional air passageways 28 are provided to interconnect the straps with the inflatable guard elements, allowing both the straps and the guard elements to be inflated and deflated as a unit. For inflation purposes a small manually operated air pump 34 is positioned at the rear upper edge of the sock, porting directly into the upper strap 30. Pumps of analogous construction are known, for example, for use in connection with inflatable footwear elements. In addition to allowing varying levels of inflation to be applied to the strap and guard elements, pump 34 is typically provided with a manually-operable release valve, whereby exhaustion of the inflated elements can be performed, both to allow the sock to be removed from the foot as well as to fine tune the level of inflation as desired. The supporting matrix 22 may likewise support the strap bladders, either about the entire periphery thereof or at least the forward sections thereof. As depicted in FIG. 1 the upper strap 30 is supported by a corresponding encircling portion of the matrix 26, while the lower strap 32 is backed by the matrix only at its forward portion.

[0021] As seen in FIG. 4, the matrix 22 supporting the inflatable elements 20 and at least the forward portion of the upper and lower straps 30, 32 may be fastened about at least its side edges at 42 to the corresponding overlying portions of sock 12, thereby maintaining the appropriate positioning of the shin guard element within the sock. Such fastening may be permanent, as by stitching or the like, or may be removable, through the use of complimentary hook and loop-type fasteners located on the matrix and on the opposed inner surface of the sock element. FIG. 4 also depicts the use of a further inner sock layer 44, which may further extend

between the guard 18 and matrix 22 and the user's skin. The inner layer may provide further cushioning.

[0022] With the inflatable elements and straps in a fully deflated condition, the sock and shin guard construction is donned in a conventional manner. Because of the lack of rigidity of the inflatable elements when uninflated, the sock can be compressed together in the manner of a conventional sock to facilitate donning, with the upper portion of the sock being pulled up, such that the sock fully covers the shin. In such a position the inflatable elements are positioned along the shin. Pump 34 is then operated as needed to provide sufficient inflation to the inflatable elements 20, while at the same time inflating the strap elements 30, 32, which gently expand and grip the leg, holding the sock in position. The sock thereby remains fully upright on the leg, providing shin protection for so long as it is worn. When it is desired to remove the sock, the valve mechanism of the pump is activated, allowing the inflatable elements and the straps to be evacuated of air, thus ending the rigidity of the construction and loosening the straps from retention upon the leg. The sock can then be pushed downwardly on the leg, in the nature of a conventional sock, and easily removed from the foot.

I claim:

1. A sock with an integral shin guard, comprising a sock having a generally upright portion dimensioned to surround at least the shin portion of a leg, and an inflatable shin guard element mounted to an inner surface of the sock in a position to overlie the shin portion.

2. The sock of claim 1, wherein the shin guard comprises a plurality of inflatable elements extending in a generally horizontal direction, the inflatable elements being mounted to a support matrix.

3. The sock of claim 1, wherein the matrix is of a fabric construction.

4. The sock of claim 2, wherein the inflatable elements have spaced adjacent side edges, the matrix comprising strip portions joining the spaced adjacent side edges.

5. The sock of claim 2, wherein the inflatable elements are constructed from a pair of flexible sheets bonded together.

6. The sock of claim 2, wherein the inflatable elements are interconnected together by air passageways.

7. The sock of claim 2 further comprising inflatable strap means for holding the sock in a fully-donned position upon the leg.

8. The sock of claim 7 wherein the strap means comprise a first strap for encircling the leg proximate a top edge of the sock and a second strap for encircling the leg proximate a lower end of the shin portion of the leg.

9. The sock of claim 8 wherein the matrix supports at least a portion of the strap means.

10. The sock of claim 7 wherein the strap means is interconnected with the inflatable elements by air passageways.

11. The sock of claim 2 further comprising an air pump for inflating the inflatable elements.

12. The sock of claim 10 further comprising an air pump for inflating the inflatable elements and strap means.

13. The sock of claim 12 wherein the pump is mounted to a rear of the sock proximate the strap means.

14. The sock of claim 2 further comprising an inner sock layer positioned between the shin guard element and the shin.

15. The sock of claim 2 wherein the matrix is removably fastened to the inner surface of the sock.

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