ATHLETIC ARMOR AND INFLATABLE BAG ASSEMBLY

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ABSTRACT

An inflatable bag for use with curvilinear athletic plate to protect anatomical parts of the torso, arms and legs. The curved athletic plate has a soft base material mounted to one side, and an opening is used to insert and withdraw an inflatable bag into the space between the athletic armor and the soft base material. The bag is inflated through air-fill means so that the assembly absorbs shocks in an improved manner.

10 Claims, 9 Drawing Figures
ATHLETIC ARMOR AND INFLATABLE BAG ASSEMBLY

This invention relates to an improved inflatable member for use with curvilinear athletic plates which operate as armor to protect the athlete. The invention relates to such inflatable members alone as well as in combination with such curvilinear athletic plates.

The use of inflatable air members has been considered in the athletic field to protect the athlete against shocks, as well as cushioning various athletic gear, particularly head gear. A co-pending application by the present applicant and another discloses a new and improved cushioning and sizing means used in combination with substantially rigid head shell, Ser. No. 54,513, filed: July 13, 1970, U.S. Pat. No. 3,677,324. That co-pending application disclosed and claimed an inflatable member mounted within the shell and having cushioning means along the opposite side walls. The inflatable member included an elongated air-fill tube with a removable closure for the tube end to seal the tube following inflation of the member after mounting the assembly on the head. This procedure results in both cushioning of the head as well as sizing a predetermined oversized shell to the head of the user.

The foregoing co-pending application achieved the advantageous result of both cushioning and sizing by inflating the air chamber after the head gear assembly was placed on the head. It has been discovered that an inflatable air chamber of particular configuration and size can be used to unique advantage when used together with curvilinear athletic plates or armor. As distinguished from the protective head gear of the co-pending application, such an air inflatable member may be used for cushioning alone by fixing the position of the inflatable member relative to the athletic armor, inflating, and then mounting the assembly to an anatomical structure such as the shin bone. On the other hand, the inflatable member may be fixed in position relative to the athletic armor, the assembly may be mounted to the anatomical structure, and the member may then be inflated to cushion, or to size and cushion.

Varieties of protective athletic armor is characterized by utilizing curvilinear plates, such as shin guards, thigh guards, hip guards, shoulder pads, and the like. Portions of ski boots and iceskates may also be considered as having curvilinear plate portions in the heel area so that an inflatable member of pre-selected size and configuration can desirably both size and cushion such foot gear.

It is accordingly one important object of the present invention to provide an improved air inflatable member adapted particularly for use with curvilinear athletic plates so as to have increased and additional advantages are realized to the user for using such conventional athletic armor.

Still yet another important object of the present invention is to provide an improved air-inflatable member of predetermined configuration and dimensions which permits such inflatable member to be fixed in position relative to a selected curvilinear athletic plate while allowing said inflatable member to be conveniently inflated through an air-fill tube which is sufficiently long to extend from beyond the protective athletic armor.

Still yet another important object of the present invention is an improved air-inflatable member which has a particular configuration and size so that it may be used to advantage to protect the shin of the user when used together with athletic armor shin covering. In similar manner, an air-inflatable member of particular configuration and size is used to advantage with knee and shin guard protective armor to protect both the knee and the shin of the user.

Yet still another important object of the present invention is to provide an improved air-inflatable member which is used together with curvilinear plates of foot gear to both size and cushion the foot of the user.

It is yet another important object of the present invention to provide inflatable members of particular configuration and size, which, however, are smaller than curvilinear athletic plate so that said inflatable member may be quickly and easily positioned relative to said plate, and replaced quickly and economically when necessary. In attaining this object, the inflatable member is conveniently positioned between the curvilinear athletic plate and a base material to which such plate is fastened, the base material usually being padding or similar cushioning. Such curvilinear plates are conventionally fastened to the base material only at a portion of the peripheral edge so that freedom of movement is maintained, as in shin guards having knee and shin bone coverings. This conventional construction allows the inflatable members of special size and configuration to be readily inserted between the curvilinear protective plate and the base material for use in the advantageous manner indicated.

The objects just recited are attained, as well as still other objects which will occur to practitioners after considering the invention of the following disclosure which includes drawings, wherein:

FIG. 1 is a front elevational view of a conventional shin guard with curvilinear protective plate used in combination with the air-inflatable member of special configuration and size;
FIG. 2 is a sectional view taken along line 2 — 2 of FIG. 1;
FIG. 3 is a front elevational view of an air-inflatable member used in combination with the shin guard of foregoing FIGS. 1 and 2;
FIG. 4 is a front elevational view of an air-inflatable member of alternative embodiment used to protect only the shin area of the user in combination with a shin covering;
FIG. 5 is a front elevational view of still another alternative embodiment which can be used with a shin cover or with other curvilinear plates;
FIG. 6 is a front elevation view of curvilinear plate or protective armor for covering the thigh;
FIG. 7 is a sectional view taken along line 7 — 7 of FIG. 6, further showing the air-inflatable member of foregoing FIG. 5 positioned thereagainst;
FIG. 8 is a side elevational view of an alternative embodiment of an air-inflatable member for cushioning and sizing the heel of the user when wearing foot gear such as ski boots or iceskates; and
FIG. 9 is a bottom elevational view of the embodiment shown in foregoing FIG. 8.

Use of the same numerals in the various views of the drawings will indicate a reference to the separate structures, parts, or elements, as the case may be.

Looking first at the shin guard assembly of FIG. 1, there is seen the conventional construction including a padding or base material 10. This includes a somewhat circular upper head portion 12 and a lower elongated
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3

shin portion 14. A circular, curvilinear knee plate or armor 16 is fastened to the base material by means such as stitching 17, but a lower portion (not shown) is free of such stitching and open. A shin curvilinear plate or armor 18 is also fastened by similar stitching along the opposite long side. The top of the shin armor overlaps the knee armor 16, as shown. The shin armor further includes a plurality of ribs which project on the outside and are recessed on the inside, in accordance with molding processes.

An air-inflatable bag or member 20 is used in combination with the conventional shin guard illustrated. The air-inflatable member of particular configuration and size has a somewhat circular head portion 22 and a lower elongated shin portion 24 separated by a reduced width neck portion 26. The air-inflatable member is formed from a pair of oppositely disposed side walls which are joined together by a peripheral heat seal 28. In addition, a plurality of transverse body heat seals 30 are shown in the shin portion 24 to partly compartmentalize the shin portion. Air entering the inflatable member communicates with the loosely defined compartments between the heat seals 30 in a manner which is evident.

An air-fill tube 32 has a flared end 34 which is heat sealed to one of the side walls of the air-inflatable member. Such a junction of air tube to side wall forms an air entry into the air chamber defined between the oppositely disposed and peripherally heat sealed side walls. The other end of the air-fill tube has a removal closure shown generally as 36. Such a closure includes a mounting ring or annulus 38 which fractionally slides along the continuous cylindrical wall of the air-fill tube. A flexible strap 40 connects the annulus 38 to a friction-sealing plug 42 which has a grasping flange or enlarged head 44.

The embodiment just described is used in combination with the shin guard shown in FIGS. 1 and 2 by inserting the shin portion 24 through the open top of the shin armor 18, and inserting the head 22 through the bottom opening of the knee armor 16. The air-fill tube is of a length sufficient to extend from behind the shin armor so that it may be conveniently used for inflation of the air-inflatable member. The air-fill tube is conveniently positioned at the reduced width neck portion 26 of the air-inflatable member so that it does extend from the overlapping junction of the shin cover and the knee cover.

The views of FIGS. 4 and 5 illustrate other embodiments of air-inflatable bags which utilize the features of the invention. Such bags or members are used together with athletic armor, particularly curvilinear plates. In general, trapezoidal inflatable member 46 of FIG. 4 has the wide side at the top from which projects an air foyier or tab 48, one side wall portion whereof has the air-fill tube mounted thereto. The entire inflatable member in the collapsed or non-inflated condition is inserted between the shin cover such as that previously illustrated and the base material. The small side or end 50 adjoins the lower portion of the shin cover and the wide side or end with the air foyier portion 48 is positioned near the top of the shin cover so that air-fill tube may extend out of the open top from behind the shin guard. The air-inflatable member 52 shown in FIG. 5 may be used in like manner by inserting in the non-inflated condition behind the shin cover, although such an embodiment is rectangular in configuration. Such an embodiment also shows elongated vertical heat seals 54 which follow the long axis of the rectangular configuration but terminate short of the opposite short sides so that air passageways for the enclosed air chamber are provided.

The air-inflatable member is used to great advantage by inserting in the non-inflated condition between a curved athletic armor and a soft base material such as padding, sponge rubber, soft plastic, etc. The inflatable member may be placed between the curved armor and the anatomical structure with types of curved plates such as thigh armor generally shown as 56 in FIG. 6. The armor includes a curved plate 58 which has a plurality of projecting ribs 60. Ties such as 61 may also be provided to hold the armor against the anatomical part or structure, although thigh armor is designed to be held in place by close fitting athletic trousers or the like. The air-inflatable member shown in FIG. 5 is used to particular advantage with armor plates such as that shown in FIG. 6, see FIG. 7. The sides of the curved armor plates 56 are spaced generally at equidistances so that a rectangular configuration of the air-inflatable member is suitably used in association with said athletic plate.

The foregoing illustrations showed an air-inflatable member consisting essentially of two side walls, each of which lies in a single plane. Such side walls, however, may assume a set curved configuration such as that illustrated by the heel and foot air-inflatable member 62 of FIGS. 8 and 9. Such a member is in the form of an arch having a central heel portion 64 to cover the back of the heel and having spaced side foot portions 66 to cover the sides of the foot. The top of the central heel portion 64 is shown with a raised heel portion 68 having an air foyier or tab 70 projecting from the top edge, the air-fill tube communicating with the air chamber at this point. In the non-set arch configuration, the air-inflatable member 62 may be considered as an elongated structure which is horizontally oriented. The upper edge of such an extended horizontally oriented structure has a raised portion 68 substantially at a central portion of the upper edge of the opposite ends or sides of the inflatable member when set in the arch position. The arch position is assumed and held by a linking tube portion 72 which is connected by heat seals at the opposite ends to the arms 66 at the lower edge thereof. Communicating air passages 76 allow the air to move through the air chamber defined by the heel portion, side foot portions and the linking tube portion.

Air-inflatable member 62 is placed around the heel of the user, and the linking tube 72 extends along the bottom of the of the heel in such position. A foot gear such as a ski boot or iceskate is mounted over the foot and the air-fill tube 32 extends out of the top of such foot gear so that it may be used to inflate member 62. Such inflation both cushions and sizes the foot securely in the foot gear. In this respect, portions of the foot gear in the heel area may be considered as the curvilinear plate or athletic armor. The foot gear is finally secured by lacing or the like, and the air-fill tube may either extend out of the top of the foot gear or be tucked within the foot gear.

The claims of the invention are now presented, and the terms of such claims may be further understood by reference to the view of the drawings and the language of the description as presented herein.

What is claimed is:

4
1. An inflatable member for use with a substantially rigid and protective athletic plate, including a pair of flexible but substantially inextensible plastic side walls forming an air chamber therebetween, said side walls being sealed along their peripheral edges, said side walls having a configuration and dimension sufficient to cover a major area of the athletic plate with which it is used, said member having a generally circular head portion, an elongated body portion, and a reduced width neck portion joining the body to the head portion, said head portion having a size sufficient to cover the knee of an athlete and said body portion having a size sufficient to cover the shin of an athlete.

2. An inflatable member which includes the features of claim 1 above, and which further includes, in combination, a curvilinear athletic plate, said athletic plate having an elongated curvilinear shin cover and a generally curvilinear and circular knee cover, said shin and knee covers being mounted on a flexible base material so that the top of the shin cover overlaps the knee cover, at least one end of said flexible base material being unsecured to said curvilinear athletic plate thereby defining an open end and said air inflatable base material mounted between said athletic plate and said flexible base material by being inserted through the open end so that the elongated body portion of the inflatable member joins the elongated curvilinear shin cover of the athletic plate, and the generally circular head portion adjoins the knee cover of the athletic plate, and said air-fill tube extending from between said athletic plate and the flexible base material.

3. An athletic assembly, including: a curvilinear armor plate dimensioned for a selected anatomical part, a soft base material mounted to one side of said curvilinear armor plate, an inflatable member positioned between the base material and the curvilinear armor plate, said inflatable member having a pair of flexible but substantially inextensible plastic side walls forming an air chamber therebetween, said side walls being sealed along their peripheral edges, said side walls having a configuration and area dimensions sufficient to cover a major area on one side of said armor plate, air-fill means communicating with said air chamber, means to seal said air-fill means to retain air blown into the air chamber of said inflatable member, and said inflatable member having area dimensions smaller than said curvilinear armor plate and said soft base material, and a portion of said base material being unsecured to said armor plate to define an opening in said assembly allowing insertion and removal of said inflatable member between said curvilinear armor plate and said soft base material.

4. An athletic armor assembly as in claim 3, wherein said plate is a unitary member for the thigh and the inflatable member has a substantially rectangular configuration.

5. An athletic armor assembly as in claim 3, wherein said plate includes an elongated curvilinear shin cover and a curvilinear and generally circular knee cover, said shin and knee covers being mounted to the base material so that the top of the shin cover overlaps the bottom of the knee cover, and said air inflatable member being mounted between such shin cover and said base material, and said air-fill means being a tube extending from between said soft base material and said shin cover.

6. An inflatable athletic armor assembly which includes the features of claim 3 above wherein said plate is a unitary member for the shin and the inflatable and the inflatable member has a rectangular configuration of a size sufficient for protecting the shin of an athlete.

7. An inflatable athletic armor assembly which includes the features of claim 3 above wherein said inflatable member has a substantially trapezoidal configuration of a size sufficient to cover the shin of an athlete, the short side of the trapezoidal configuration selected for positioning at the lower shin portion of an athlete.

8. An inflatable member which includes the features of claim 3 above in which the inflatable member has a substantially circular head portion spaces from an elongated body portion by a reduced width neck area, said circular head portion having a size sufficient to cover the knee of an athlete and said body portion having a size sufficient to cover the shin of an athlete.

9. An inflatable member and an athletic plate combination to envelop a minor part of the anatomical girth, including a substantially rigid and protective curvilinear athletic plate, a flexible base material mounted to the inside curve of said athletic plate, means securing the opposite sides of said soft material to the athletic plate, at least one end of said base material being unsecured to said curvilinear athletic plate thereby defining an open end.

10. An inflatable member having a size and dimension to be received through said open end between the flexible base material and the substantially rigid protective athletic plate, said inflatable member having a pair of flexible but substantially inextensible plastic side walls forming an air chamber therebetween, said side walls being each sealed along their peripheral edges, an air-fill tube having a cylindrical wall means sealingly mounting said air-fill tube at one end of said side walls in communication with said air chamber, said air tube being sufficiently long to extend our from between said base material and said athletic plate when said inflatable member is positioned between the flexible base material and the athletic plate, and a frictional closure for sealing the other end of said air-fill tube.

11. An athletic armor assembly as in claim 5 wherein the top of the shin cover overlaps the bottom of the knee cover.