INFLATABLE PADDING FOR FOOTBALL HELMET OR THE LIKE

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Abstract

An inflatable padding for attachment to the interior surface of a helmet, for protecting the head of a participant in a sporting event, such as a football game. The inflatable padding comprises a plurality of inflatable bag-like means or members adapted for positioning about the head of the wearer, with means coupling at least certain of the bag-like members together for transfer of pressurized fluid therebetween, and with a valve means coacting with said bag-like members for enabling insertion of pressurized fluid thereinto, with the valve means including an arrangement for selective substantially simultaneous inflation of some of the members with respect to other of the members. Inflation of the padding while on the head of the wearer, provides for a snug custom-like fit on the helmet with the head of the wearer.

11 Claims, 7 Drawing Figures
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INFLATABLE PADDING FOR FOOTBALL HELMET OR THE LIKE

This invention relates in general to headgear, and more particularly to a novel inflatable padding assembly for a headgear, adapted for disposal on the interior surface of a helmet for use in protecting the head of a participant in a sporting event, such as for instance football or other like sports. The padding is adapted for inflation after the helmet and padding assembly is placed on the head of the wearer, to provide a custom-

like fit.

BACKGROUND OF THE INVENTION

Inflatable padding assemblies for safety hats are known in the prior art. U.S. Pat. No. 2,759,186 issued Aug. 21, 1956 in the name of E. R. Dye, discloses an arrangement which includes an inflatable padding formed of a plurality of pillow cells interconnected for transferring pressurized fluid therebetween. In applicant's U.S. patent application Ser. No. 676,394 filed Oct. 19, 1967 and entitled "Football Helmet" which application is not abandoned, there is disclosed a football helmet formed of a shell of lightweight metallic material and having an inflatable padding assembly attached to the interior of the shell, for effecting a snug fit for the helmet when placed upon the head of the wearer and for cushioning the head of the wearer.

SUMMARY OF THE INVENTION

The present invention provides an inflatable padding assembly which is adapted for attachment to the interior surface of a helmet, for cushioning the head of the wearer and for providing a snug fit for the helmet on the head of the wearer, with the padding assembly comprising a plurality of inflatable bag-like members certain of which are coupled together for transfer of pressurized fluid therebetween, and which includes a novel valve means whereby selective substantially simultaneous inflation of certain of said members with respect to other of said members can occur.

Accordingly, an object of the invention is to provide a headgear specially adapted for football and like sporting events, and which includes a novel inflatable padding for cushioning the head of the wearer of the headgear, and for providing for a snug fit of the headgear with the head of the wearer, with the padding comprising a plurality of inflatable bag-like members adapted for disposal about the head of the wearer, with at least certain of the bag-like members being coupled together for transfer of fluid pressure therebetween, and with valve means cooperating with one of the members for selective substantially simultaneous inflation of some of the members with respect to other of the members.

Another object of the invention is to provide a arrangement of the aforesaid type wherein the inflatable padding includes a generally central crown or top section and a plurality of other sections disposed at a generally lower elevation, for padding the forehead and rear portions of the head as well as the side portions, and wherein inflation of the rear, front and side portions of the inflatable padding can be accomplished substantially simultaneously subsequent to inflation of the crown portion, for enabling a more uniform and expeditious fitting of the headgear to the head of the wearer.

A further object of the invention is to provide an inflatable padding in accordance with the above wherein the front, rear and side bag-like members are each comprised of individual cells interconnected for transfer of fluid pressure therebetween, and with conduit means coupling a generally centrally located valve disposed in the crown section of the padding with the rear, front and side sections of the padding

A still further object of the invention is to provide an improved headgear specially designed for football and like sporting events, which is relatively lightweight and which includes an inflatable padding for highly effective cushioning of the head of the wearer, and wherein the padding includes a valve means for providing for selective inflation of parts of the padding with respect to other parts thereof, so that a uniformly snug fit of the helmet or headgear with respect to the wearer's head may be effectively accomplished.

Other objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings wherein:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a perspective illustration of an inflatable padding constructed in accordance with the present invention as mounted in a football helmet, with the latter being shown primarily in phantom.

FIG. 2 is a broken vertical sectional view of the valve mechanism of the padding disposed in the crown portion of the inflatable padding and showing the construction thereof which enables selective inflation of certain parts or members of the inflatable padding with respect to other parts or members thereof. An inflating needle is shown inserted into the valve mechanism for inflating said certain parts of the padding.

FIG. 3 is a fragmentary view generally similar to FIG. 2, but showing the positioning of the inflating needle wherein the other part or member of the inflatable padding is capable of being inflated by the fluid pressure inserted thereinto by the inflating needle.

FIG. 4 is a sectional view of the rear member section of the inflatable padding, taken generally along the plane of line 4—4 of FIG. 1 looking in the direction of the arrows, and showing the interconnected cells for the rear member section.

FIG. 5 is a sectional view taken generally along the plane of line 5—5 of FIG. 1 looking in the direction of the arrows and illustrating one cell of the inflated rear member section of the padding, and its connection by means of an elongated conduit to other sections of the padding for receiving fluid pressure from the valve mechanism.

FIG. 6 is a elevational view of one of the side sections of the inflatable padding illustrating the interconnected inflated cells thereof and a portion of the conduit means which couples the side section to other sections of the padding and to the aforementioned valve mechanism for accomplishing inflation of the padding.

FIG. 7 is a sectional view taken generally along the plane of line 7—7 of FIG. 6 looking in the direction of the arrows.

DESCRIPTION OF PREFERRED EMBODIMENTS

Referring now again to the drawings, there is illustrated a helmet 10 which is adapted to protect the head of the wearer in a sporting event, such as football. The helmet may be comprised of a thin shell formed of a lightweight metallic material, such as, for instance, aluminum. However, other conventional materials can be
utilized for the aforementioned shell of the helmet. A suitable covering of plastic or nylon material, or any other suitable material, may be disposed on the exterior surface of the shell and bedding or edging material may be applied along the peripheral edge of the shell in the conventional well-known manner. Such edging or bedding material may be formed of any suitable material such as, for instance, elastomeric plastics or rubber.

The shell may be provided with suitable openings or holes (not shown) in the side portions thereof in the vicinity of the ears of the wearer, for facilitating hearing by the wearer.

The padding assembly 14 with which the present invention is particularly concerned, is mounted on the interior surface of the shell 10 so as to space the latter from the head of wearer to user.

The padding assembly may comprise a top or crown portion or member 16, a frontal portion or member 18, a rear portion or member 20, and side portions or members 22, which when inflated are capable to cushion the head of the wearer from impacts, and to snugly hold the helmet to the head of the wearer in a custom-like fit.

The padding is illustrated in inflated condition and the crown or top portion 16 has a valving mechanism 24 (FIGS. 2 and 3) mounted thereon, or coacting therewith, for insertion of pressurized fluid into the inflatable padding. This insertion of pressurized fluid is preferably accomplished by means of an inflating needle 26 of conventional type, which is adapted to be inserted into the self-sealing valve and to direct pressurized fluid such as air thereinto.

From the aforementioned 18 of the padding, in the embodiment illustrated, comprises three individual cells 28, 28a and 28b which are interconnected or communicated with one another by means of relatively short passageway sections 30, for transfer of pressurized fluid theretwixt. Rearward portion or member 20 of the inflatable padding likewise, in the embodiment illustrated, is formed of three individual cells or bags 30, 30a and 30b, which are interconnected by relatively short passageway sections 32 for transfer of fluid pressure theretwixt.

The side portions or members 22 are each formed of a plurality of individual cells, the upper 34, 34a of which are in the form of generally kidney-shaped configurations, and the lower 36 of which is of a generally lazy U-shaped configuration, all of which are interconnected with conduit or passageway sections 38 for transfer of fluid pressure theretwixt.

The top or crown portion 16 of the inflatable padding comprises in the embodiment illustrated a single generally egg-shaped (when inflated) cell, and with the single cell mounting the aforementioned valve means 24 thereon. Valve means 24 is coupled as by means of elongated flexible conduit or arm members 40 radiating out from the valve member to be coupled to the respective of the side, frontal and rearward portions of the inflatable padding.

As can be seen from the drawings, the inflatable padding may be readily constructed of heat-sealable plastic material, many of which are known in the art, such as, for instance, polyvinyl materials. Each section or member of the inflatable padding may be formed from a base sheet or section 44 (FIGS. 4, 5 and 7) and a cover or pillow sheet 46 which are joined along the seam 48. The aforementioned radiating conduit sections 40 can be unitarily formed from the base and pillow sheets, for facilitating the manufacture of the inflatable padding.

As can be readily seen in FIGS. 4 and 7, when the respective padding section or member is inflated, the base sheet which is adapted for attachment to the inner surface of the helmet proper by any suitable means, such as for instance adhesives, mating tapes of Velcro, or mechanical fasteners, is extended a considerably lesser amount than is the inwardly facing cushion or pillow sheet of the respective portion of the padding.

As can be seen in FIGS. 4, 5 and 7 each of the members 16, 18, 20 and 22 preferably has interiorly thereof a cushioning pad 49 formed of suitable resilient material, such as for instance sponge rubber or flexible polyurethane foam. Each pad 49 occupies a portion of the respective cell of the associated member and is preferably comprised of a base layer 49a of a denser, less flexible nature, and a facing layer 49b of a lighter, softer nature, with the softer layer being disposed closest to the wearer's head. The pads 49 may be porous and do not restrict the transfer of fluid between the interconnected cells.

Referring now in particular to FIGS. 2 and 3, the aforementioned valve 24 for selective inflation of certain of the padding portions or members with respect to other of the padding portions comprises a head portion 50 and a separable base portion 52. The valve is preferably formed of soft elastomeric material, such as for instance, the conventional self-sealing rubber or plastic materials from which valve mechanisms for sporting goods such as footballs are conventionally made. The head portion is adapted to communicate through an opening 54 in helmet shell 10 of the head gear (FIG. 2) with the exterior of the head gear, and at the crown portion thereof (FIG. 1). The upper embodiment or crown 56 of the head 50 of the valve mechanism is adapted to extend into the opening 54 for ready accessibility to the inflating needle 26. The embodiment or crown 56 is preferably provided with sloping surfaces 56a coacting with complementary surfaces in opening 54 in the helmet shell, for facilitating securing the embodiment to the shell 10 and as by means of an adhesive.

The head section 50 has a generally flat undersurface 58 which is adapted for mating sealed coaction with flat surface 60 on the base section of the valve mechanism. Complementary projection and recess means 62, 62a may be provided for locating the base section of the valve mechanism with respect to the head section. Base section 52 includes chamber 64 located generally centrally thereof and from which laterally extending, opposed passageways 66 extend, for communication with the aforementioned elongated conduits 40 and as by means of integral collar portion 68, which surrounds the base section 52 of the valving mechanism in sealed relation therewith and which provides communication of the aforementioned passageways 66 with the conduit members 40. As can be seen, the base section 52 includes a flange portion 72 which overlies the defining upper wall of top cushion member 16 and which is bonded or sealed thereto. Likewise, head section 50 of the valve may include a peripheral flange 74 which is sealed to the juncture of conduit arms 40 to aid in providing an air tight high strength assembly of the valve mechanism to the padding cushion structure.

As can be seen in FIG. 2, insertion of the inflating needle 26 through the self-sealing needle receiving pas-
sage 76 in head section 50 of the valve mechanism 24, communicates the fluid discharge end of the needle with the chamber 64 in the valve, and upon application of pressurized fluid to the entry end of the needle, causes fluid to be distributed to the chamber 64, out passages 66, through the interior of collar 68, and into communication with the conduit arms 40, thus causing substantially simultaneous inflation of the front, rear, and side cushion members 18, 20 and 22. With the head gear positioned on the head of the wearer, the substantially simultaneous inflation of the side cushion members together with the inflation of the front and rear cushion members causes a uniform fit of the helmet to the head of the wearer.

Referring to FIG. 3, when the needle is forced downwardly past chamber 64 into the self-sealing needle receiving passage 78 in base section 52 of the valve mechanism, the discharge end of the needle passes into the interior of top cushion member 16. Application of fluid pressure to the top cushion member 16, causes inflation of the latter, and thus positions the helmet vertically with respect to the head of the wearer. Withdrawal of the needle from the valve mechanism permits the valve mechanism to self-seal, and thus the fluid is retained in the cushioning members 16 through 22. It is preferable to inflate top member 16 first, to position the helmet with respect to the head of the wearer, and then to cause inflation of the front, back and side cushion members, although the reverse order can be followed.

From the foregoing discussion and accompanying drawings it will be seen that there is provided a novel inflatable padding adapted for attachment to the interior surface of a helmet for protecting the head of the wearer, and with the padding embodying valve means that enables the selective inflation of some of the members with respect to the other of the members with substantially simultaneous inflation of certain of the members, and an arrangement which provides for a snug custom-like fit of the helmet to the head of the wearer, to give the latter optimum cushioning protection. The invention also provides a padding in accordance with the foregoing in combination with a lightweight helmet for providing for optimum protection to the head of the wearer.

The terms and expressions which have been used are used as terms of description and not of limitation, and there is no intention in the use of such terms and expressions of excluding any equivalents of any of the features shown, or described, or portions thereof, and it is recognized that various modifications are possible within are scope of the invention claimed.

What is claimed is:
1. An inflatable padding adapted for attachment to the interior surface of a helmet for use in protecting the head of a participant in a sporting event, such as a football game, comprising a plurality of inflatable bag-like members including side members, front and rear members, and a top member, each of said side members comprise generally kidney-shaped cell sections coupled by means of relatively short fluid passing passageway means to one another, and a generally U-shaped cell section coupled at its ends by other fluid passing passageway means to the respective kidney-shaped portion, said top member being adapted for disposal in the crown of said helmet, and said side members being adapted for disposal adjacent the interior side walls of the helmet for protecting the ear portions of the wearer, and said front and rear members being adapted for disposal respectively adjacent the interior front and rear portions of the helmet, coupling means connecting said side, front and rear members together for transfer of fluid theretbetween, a valve means coacting with said members for enabling insertion of pressurized fluid theretointo, said valve means including means providing for selective substantially simultaneous inflation of certain of said members with respect to other of said members.
2. An inflatable padding in accordance with claim 1 wherein said coupling means communicates with the rearward one of the respective kidney-shaped cell sections of the respective side member.
3. An inflatable padding in accordance with claim 1 wherein said valve means includes a pair of separable sections, one of said sections comprising a head portion and the other of said sections comprising a body portion, means adapted for coaction between said sections for coupling the latter together, said head portion including a crown portion defining a needle receiving passage therethrough having self-sealing means coacting therewith for automatically sealing the needle passage upon withdrawal of the needle, and said body portion defining an air chamber with means coacting with said chamber for transferring pressurized fluid from said chamber to exteriorly of said body portion for said selective inflation of said members, said body portion also including means defining a needle passage adapted to receive an inflating needle and having self-sealing means coacting therewith, the second mentioned needle receiving passage being disposed in alignment with said said chamber, and with the first needle receiving passage.
4. An inflatable padding in accordance with claim 3 wherein said head portion includes a peripheral flange for sealing the head portion with respect to said coupling means.
5. An inflatable padding in accordance with claim 3 wherein the coupling means comprises flexible arm-like members which include lengthwise extending conduits therethrough, said conduits communicating with a respective of said members, and with said valve means for transfer of fluid pressure from the valve means to the respective members.
6. An inflatable padding in accordance with claim 3 wherein said body portion includes a peripheral flange adapted for coaction with said coupling means for transferring fluid pressure from said chamber of said body portion to the respective of said members.
7. An inflatable padding in accordance with claim 1 in combination with a helmet, and means securing said padding to said helmet.
8. The combination in accordance with claim 7 wherein said helmet is formed of lightweight resilient metallic material.
9. An inflatable padding in accordance with claim 3 wherein said members include side members, front and rear members and a top member, said top member being adapted for disposal in the crown of said helmet, and said side members being adapted for disposal adjacent the interior side walls of the helmet for protecting the ear portions of the wearer, and said front and rear members being adapted for disposal respectively adjacent the interior front and rear portions of the helmet, said coupling means connecting said side, front and
rearm members together for transfer of fluid therebetween, and wherein said chamber of said valve means communicates with said coupling means, and said top member is adapted for communication with said valve means via said second-mentioned needle receiving passage.

10. Valve means for use with an inflatable member comprising a pair of sections, one of said sections comprising a head portion and the other of said sections comprising a body portion, said head portion including a crown portion defining a needle receiving passage therethrough having self-sealing means coacting therewith for automatically sealing the needle passage upon withdrawal of the needle, and said body portion defining an air chamber with means coacting with said chamber for transferring pressurized fluid from said chamber to exteriorly of said body portion, said body portion also including means defining a second needle passage adapted to receive an inflating needle and having self-sealing means coacting therewith, the second mentioned needle receiving passage being disposed in alignment with said chamber, and with the first needle receiving passage.

11. Valve means as defined in claim 10 and wherein the valve sections are separable and means coact therebetween to couple said sections together.

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