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M. T. MARIETTA
PROTECTIVE HEADGEAR
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3,568,210

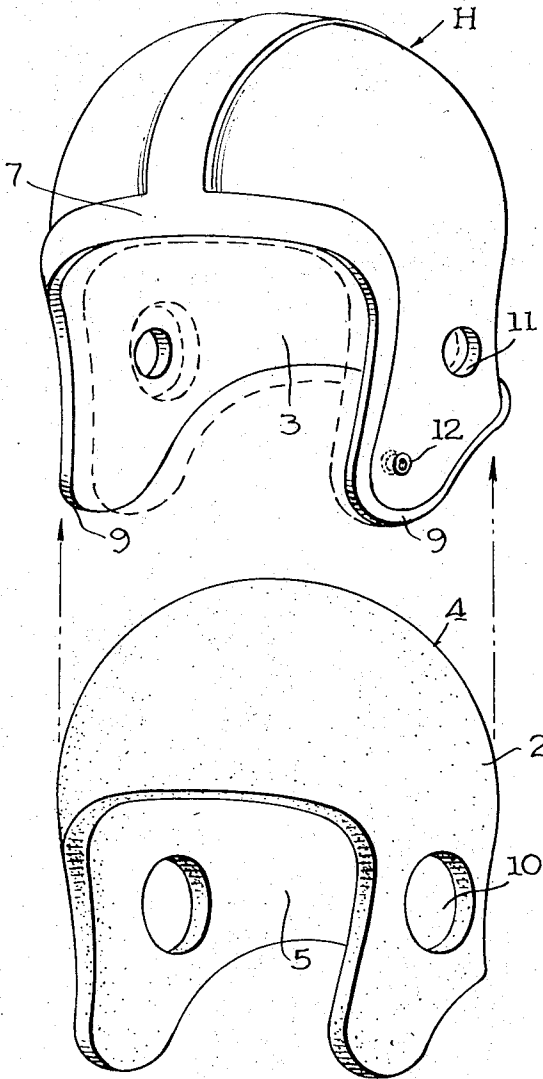


FIG. 1.

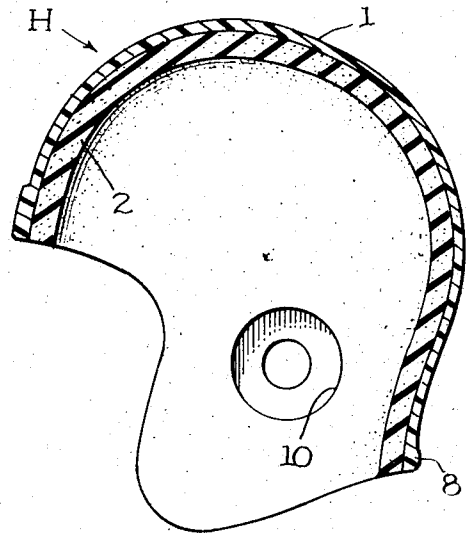


FIG. 2.

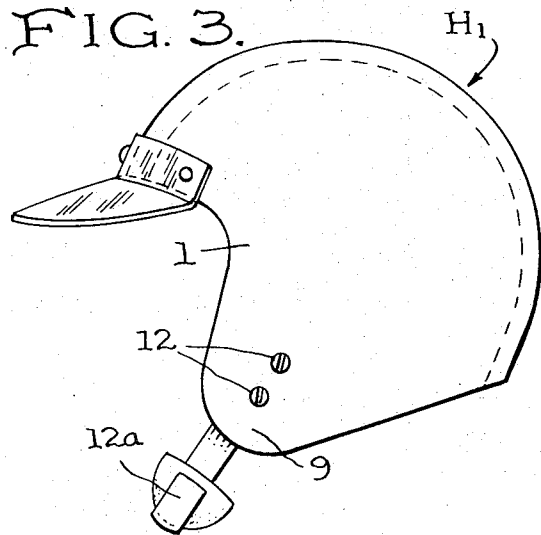


FIG. 3.

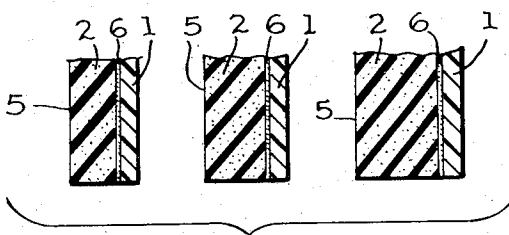


FIG. 5.

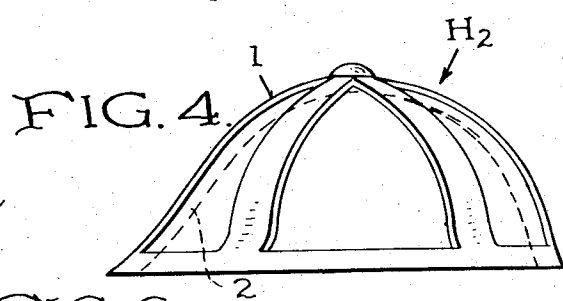


FIG. 6.

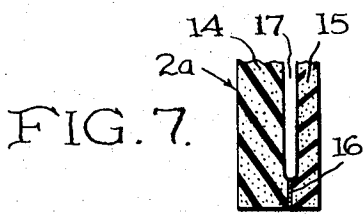


FIG. 7.

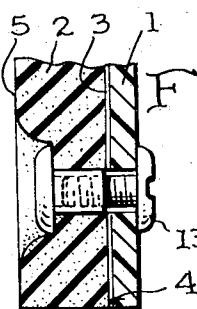


FIG. 8.

INVENTOR

MICHAEL T. MARIETTA

BY

Emory C. Groff, Jr.

ATTORNEY

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Michael T. Marietta, 1806 Main St.,
Dallas, Tex. 75201
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1 Claim

ABSTRACT OF THE DISCLOSURE

A customized protective helmet including a rigid outer shell of standard size and fitted with a specific sized cushioning head form with fastening means securing the head form to the shell.

This invention relates generally to headgear, and more particularly to an improved protective headpiece having means for the ready provision of a custom-sized article.

Numerous types of safety headgear have been developed for use by individuals engaged in specialized activities, both sporting and occupational. In most instances such headgear usually comprises a substantially lightweight yet highly shock resistant outer shell provided on the interior thereof with suitable yieldable protective padding. From the feasibility standpoint one of the most outstanding problems involved in using the prior known devices is that of securing and maintaining on hand an adequate supply of the proper sizes of protective headgear in order to insure the constant availability of a proper sized helmet in order to serve any customer in the case of a dealer, or to equip every team member in the case of a sporting organization. As one may readily realize, such a requirement would amount to a considerable inventory especially in the case of a college or professional football squad, for example. Heretofore it has been necessary to provide a plurality of different sized shells into which a more or less standard type of resilient padding was installed at localized points within the shell such as the cheek portions and the front and rear rims of the shell. Even when an individual selected a specific sized shell it has been necessary to further adapt the headgear to the individual's head size by means of a harness or webbing arrangement which is adjusted to properly engage the crown portion of the wearer's skull and thus actually supports the weight of the helmet on the wearer's head.

In the case of headgear such as the military headliners and the safety hat as worn by workers in the construction field, it has not been necessary to provide for as many different individual sized shells since usually only a single dimensioned shell is provided and the wearer adapts the headgear to his particular head size by adjustment of a webbing or harness assembly installed within the shell.

By the present arrangement provision is made for the customizing of a single sized shell for the specific use of any of various sized heads, thereby precluding the necessity of maintaining a stock of numerous sized shells. This is achieved by inserting a liner or head form or resilient protective material within the interior of the shell, the thickness of which liner is selected according to the size of the intended wearer's head such that a snug fit will be provided without the necessity of the heretofore utilized harness or webbing assemblies.

Accordingly, one of the primary objects of the present invention is to provide a customized protective headgear by utilizing a fixed or standard sized shell and installing therein a resilient liner the interior configuration of which provides a snug fit with the wearer's head.

A further object of the present invention is to provide a protective headgear comprising an outer shell and an

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inner resilient liner which is substantially coextensive with all of the interior portion of the shell.

Still another object of the present invention is to provide an improved protective headgear comprising a standard sized shell and a substantially coextensive inner resilient head form which is adhesively attached to the interior of the shell.

Another object of the present invention is to provide a protective headgear comprising a fixed sized outer shell and a resilient inner liner of a thickness selected to provide a snug fit with the specific individual's head and which is secured to the shell by removable mechanical fastenings.

With these and other objects in view which will more readily appear as the nature of the invention is better understood, the invention consists in the novel construction, combination and arrangement of parts hereinafter more fully described, illustrated and claimed.

A preferred and practical embodiment of the invention is shown in the accompanying drawing, in which:

FIG. 1 is an exploded front perspective view of a protective headgear according to the present invention.

FIG. 2 is a longitudinal vertical sectional view of an assembled headgear according to the present invention.

FIG. 3 is a side elevation of a modification of the present invention.

FIG. 4 is a side elevation of still another modification of the present invention.

FIG. 5 is a transverse sectional view illustrating the use of head forms of various thickness to secure the customized protective headgear of the present invention.

FIG. 6 is a transverse fragmentary sectional view illustrating removable attaching means for the head form.

FIG. 7 is a modified head form arrangement.

Similar reference characters designate corresponding parts throughout the several figures of the drawing.

Referring now to the drawing, more particularly to FIG. 1, the present invention will be seen to comprise two principal components, namely an outer shell 1 and an inner head form or liner 2. The outer shell 1 may be formed of any suitable substance capable of producing a lightweight, strong, shock resistant element such as metal or glass fibers impregnated with thermosetting plastics, while the inner head form 2 is preferably vacuum molded member formed from any suitable resilient rubber-like composition that will hold its shape when molded.

In the formation of the helmet H of the present invention a substantially rigid shell 1 is selected having a cavity as defined by the dimensions of the shell inner surface 3 which is substantially larger than the average head size. To provide the customized headgear a head form 2 is inserted within the cavity of the shell so that the entire outer surface 4 of the head form is disposed in a coextensive manner with substantially the entire inner surface 3 of the shell. Thus, it will be apparent that the head form 2 is molded to provide an outer surface 4 having a dimension substantially corresponding to the dimension of the shell inner surface 3; however the inner surface 5 of the head form 2 is sized according to the particular wearer's head. Thus it will follow that the resultant thickness of any two head forms 2 as utilized by persons having different head sizes will vary. This point will be clarified upon a review of FIG. 5 which illustrates in cross section three different headgears as customized for persons having three different head sizes. It will be understood that the shell 1 as shown in the three examples of this figure is of the same size, that is the cavity defined by the inner surface 3 of the different helmet shells 1 is of an equal dimension; however it will be seen that the head form 2 combined with the three shells 1 are of different thicknesses such that the cavity formed by the

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inner surface 5 in each instance varies in dimension although the outer surface 4 of each is of an equal dimension. By way of comparison, one may arbitrarily consider that the left-hand example represents a size 8 helmet, the intermediate example a size 7 helmet, and the right-hand example a size 6 helmet.

Reference may also be made to FIG. 5 to illustrate one manner of attaching the selected head form 2 to the inner surface 3 of the standardized shell 1. A layer of adhesive 6 which may be of any suitable composition is applied to either or both of the surfaces 3 and 5 prior to insertion of the head form into the shell and therefore provides a permanent assembly of the two helmet components. It will be understood that the adhesive 6 may be applied to only local specific areas between the two components or may be applied over the entire coextensive surfaces thereof.

An important feature of the instant headgear is that the head form 2 is constructed to substantially overlie in a coextensive manner the entire shell inner surface 3 from the shell front edge 7 to the hear portion or rim 8 and thence laterally and downwardly to the shell lower side edges 9 whereby the entire head area of the wearer will be engaged and protected by the juxtaposed inner surface 5 of the head form and the necessity of providing for the heretofore conventional harness or webbing arrangements is precluded.

In practicing the present invention in the case of a protective headgear which extends downwardly below the level of the wearer's ears such as the football helmet H or the cycle helmet H₁, it may be desirable to provide an ear opening 10 through the head form 2 which opening is preferably large enough to provide clearance for the majority of the wearer's ear when the helmet is in the wearing position. An appropriate smaller side opening 11 may be provided through the shell 1 concentrically disposed with respect to the ear opening 10 of the head form. In the case of the football helmet H or the cycle helmet H₁, any appropriate type of fastening means 12 may be provided on the lower side edges 9 of the shell 1 to permit the ready attachment and removal of a chin strap 12a and/or face guard. Also it will be appreciated that in lieu of the adhesive composition 6 for securing the head form 2 to the shell 1, an appropriate mechanical type of fastener 13 may be utilized as shown in FIG. 6. In this instance a two-part threaded type fastener is shown, the use of which obviously would permit removal of the specific head form 2 being used so that the head form could be cleaned or to permit a change of the head size of the assembled helmet by the substitution of a thicker or thinner head form within the same shell. The fastening means 12 which usually comprises a snap head for attachment of the chin strap 12a can be combined with the liner fastener 13 when the adhesive layer 6 is not utilized

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The embodiment illustrated in FIG. 4 employs the same basic concept as shown in helmets H and H₁. This helmet, H₂, is designed to protect the upper portion of a wearer's head and is popular for use in the construction and industrial environments.

The liner construction 2a shown in FIG. 7 may be used in connection with any one of the helmets H, H₁, or H₂ and is intended to provide additional cushioning action, particularly when a hard blow is delivered to the shell 1. In this arrangement the liner comprises two different thicknesses or plies 14 and 15 of vacuum formed rubber or the like, the combined thickness of which would be equal to the thickness of a single ply liner as used for a particular head size.

An important feature associated with the twin-ply liner 2a is that the entire peripheral edge portions of the juxtaposed plies 14 and 15 are heat-sealed or otherwise adhesively joined to provide a fluid-tight joint as at 16 in FIG. 7. The resulting chamber 17 formed by the oppositely disposed faces of the plies 14 and 15 may be filled with any suitable fluid gelatine substance or even air such that a shiftable or yieldable action will occur when a blow is received by the wearer, thus further enhancing the cushioning effect of the present invention. Quite obviously at least the opposed faces of the twin plies 14 and 15 should be sufficiently impervious to the selected fluid contents in the chamber 17 to preclude undesirable leakage therefrom.

I claim:

1. A helmet comprising, a substantially rigid outer shell having an inner surface defining a dimension substantially larger than the wearer's head, a head form of rubber-like material having limited compressibility disposed in a co-extensive manner within said shell, said head form including two co-extensive plies of said material sealed adjacent their juxtaposed peripheral edges to provide a chamber therebetween, a shiftable liquid disposed within said chamber, said head form provided with ear openings and otherwise presenting an imperforate inner surface and unobstructed chamber, the outer surface of said head form mating with the juxtaposed inner surface of said shell and means securing said outer surface of said head form to said shell.

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JAMES R. BOLER, Primary Examiner