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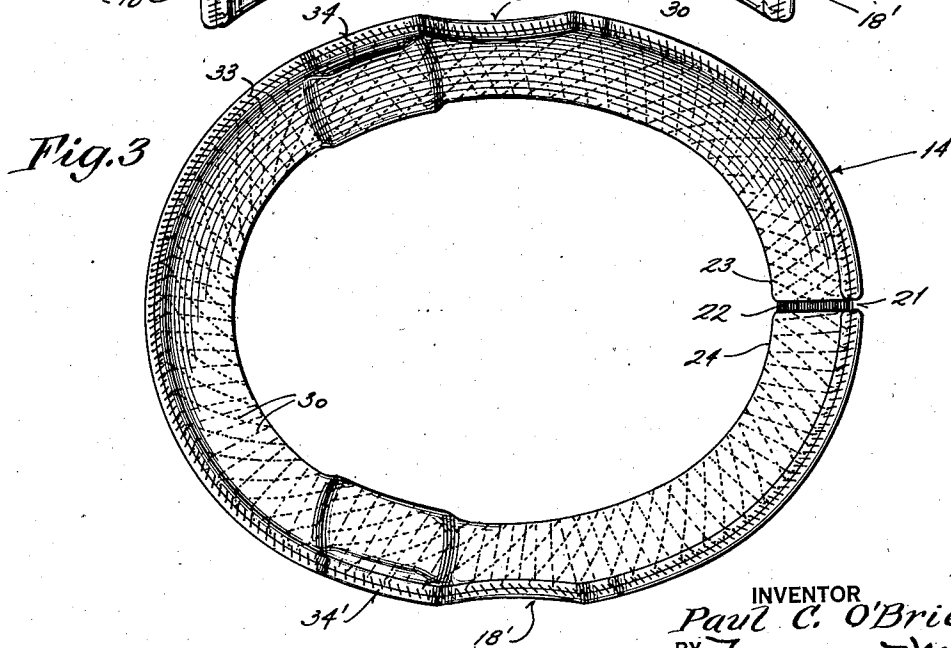
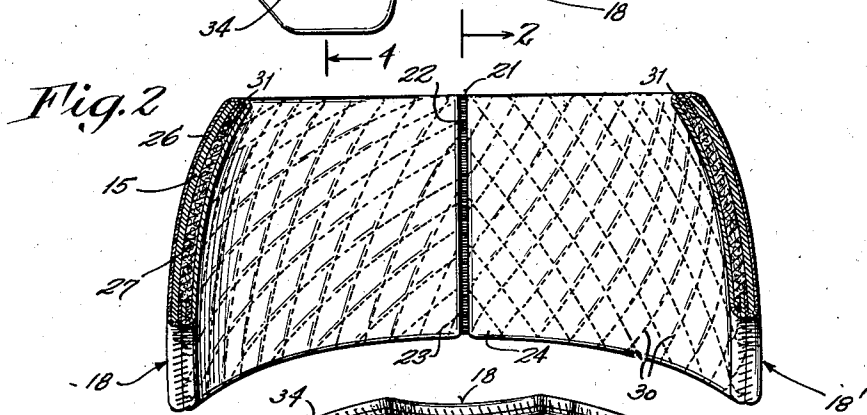
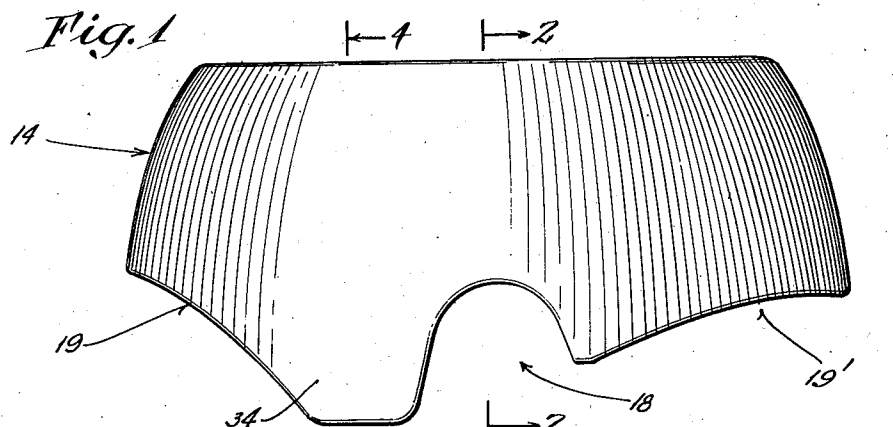
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2,391,335

HEAD PROTECTOR

Filed April 5, 1941

2 Sheets-Sheet 1



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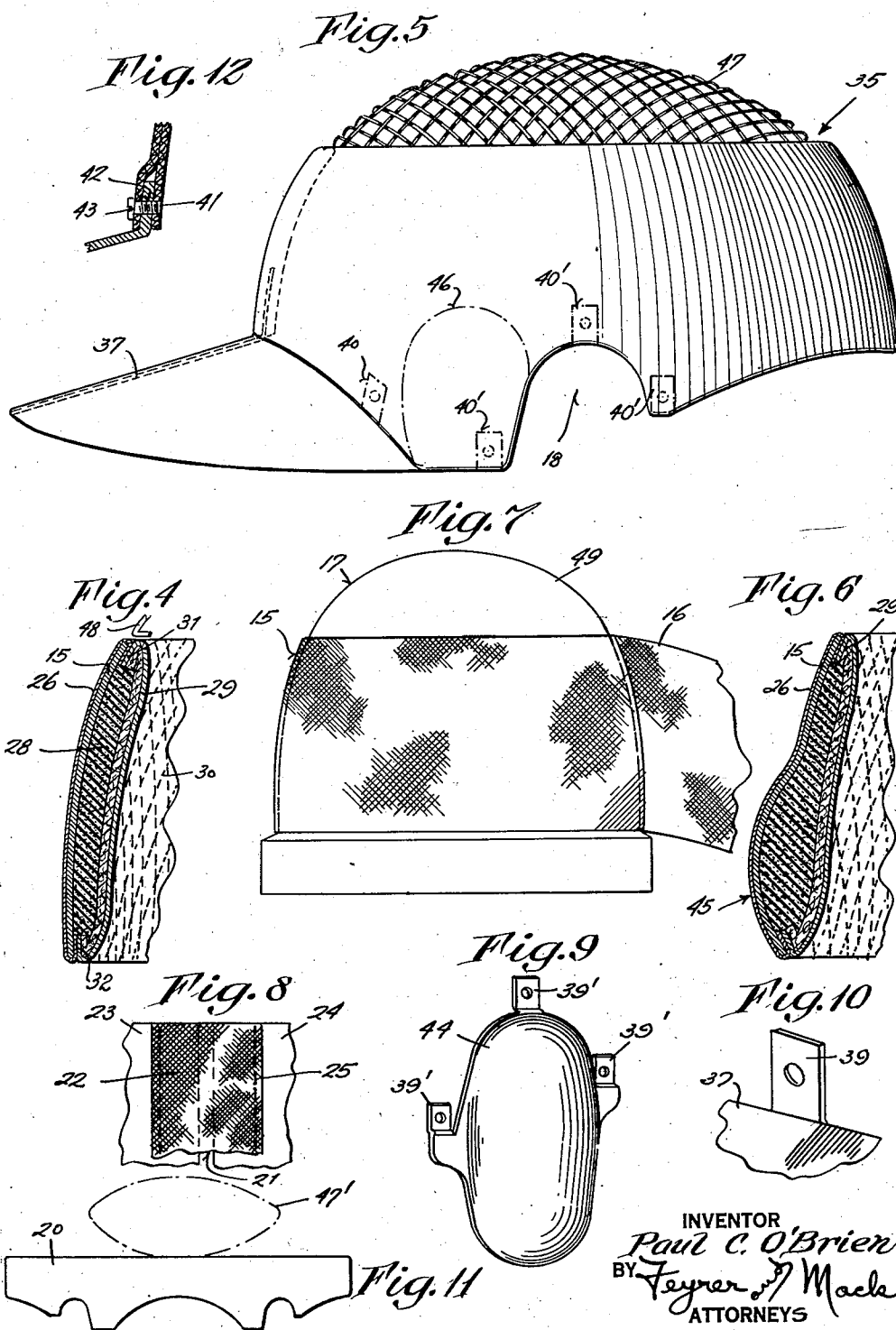
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UNITED STATES PATENT OFFICE

2,391,335

HEAD PROTECTOR

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8 Claims. (Cl. 2—3)

This invention relates to head protectors.

Although there has been a full appreciation of the need for a good head protector, to guard the head and particularly the temple section of baseball players against inadvertently and dangerously pitched, thrown, foul and struck baseballs, it appears that no really satisfactory one has yet been proposed.

Heretofore a number of head protectors have been proposed. However, most of these were costly, large, heavy and cumbersome structures which either failed to function properly, or proved to be generally unsatisfactory. Further, many of these prior proposals were so stiff and hard that users found them unpleasant to wear, and consequently discarded the same.

It is a primary object of the present invention to overcome the prior deficiencies in head protectors, some of which were just outlined.

Other objects of the present invention include the provision of: a head protector which, although it is light in weight, will be strong enough to resist the full impact of any ball which might otherwise inadvertently strike the head of a player; a head protector which will have a snug, comfortable and pleasant feel upon the head of a player; a head protector which may accommodate itself to divers (e. g., long, round, oval) shaped heads; a protector which will be both extremely light and extremely strong; a head protector structurally arranged to deflect the force of a missile; a protective device which will not bother the ears or other parts of the wearer's head; a head protector which may readily accommodate a top closure member, a peak, and/or earshields.

Features of the present invention resulting from accomplishing some of these objectives include the provision of: a stiffened shell of great strength and light weight; a shell of fabric or the like strengthened by impregnation to resist considerable impact; a shell of stiff yet form-fitting characteristics enveloping the weaker parts of the person's head and having outwardly extending bulges thereon to deflect missiles from the less naturally protected parts of the wearer's head; a base or body section adapted to easily receive and support a peak and earshields.

It is another important object of the present invention to provide a method for easily and economically manufacturing head protectors.

A feature resulting from the attainment of the latter object is the provision of a method which may be practiced by a comparatively unskilled person, including simple steps such as merely

winding and impregnating a strip of fabric upon a suitable form.

Other objects, features and advantages will appear hereinafter.

In the drawings:

Figure 1 is a side view of the present preferred form of head protector.

Fig. 2 is a sectional view taken on line 2—2 of Fig. 1.

Fig. 3 is a bottom plane view of the protector shown in Figs. 1 and 2.

Fig. 4 is a fragmentary sectional view taken on line 4—4 of Fig. 1.

Fig. 5 is a side view of a modified or cap form of the present invention.

Fig. 6 is fragmentary sectional view similar to Fig. 4.

Fig. 7 is a view of the form.

Fig. 8 is a fragmentary section of the resilient connector.

Fig. 9 is a detail of the ear protector.

Fig. 10 is a fragmentary detail of the eyeshield or peak.

Fig. 11 is a plane view of a cutout blank of the fabric.

Fig. 12 is a fragmentary view of a modified form of peak connection.

Before describing the present improvements and mode of operation thereof in detail it should be understood that the invention is not limited to the details of construction and arrangement of parts shown in the accompanying drawings, which are merely illustrative of the present preferred embodiments, since the invention is capable of other embodiments, and the phraseology employed is for the purpose of description and not of limitation.

Referring now in detail to the drawings which disclose the present preferred embodiments of the invention, and first to the protector 14 of Figs. 1 through 4, the present invention includes an annular shell 15, which is preferably of a fibrous material (e. g., felt) or fabric material (e. g., muslin), both types hereinafter referred to generally as fabric. This annular shell 15 is preferably made by dipping a strip of such fabric 16 into a suitable impregnating and hardening agent such as a thin solution of shellac, Bakelite varnish or other liquid or plastic solution of natural or synthetic resins. This impregnated strip of fabric is then wound upon a form 17 (see Fig. 7) of suitable configuration and is allowed to dry and stiffen upon the form. Preferably several complete winds of a strip of the impregnated fabric are placed on the form. Alternatively, a plurality

of short strips of fabric may be wound upon the form. This mold is preferably of a somewhat oval shape transversely and is of convex form vertically as view in Fig. 7, to conform with the general shape of heads. The shell 15 is shown only schematically in Figs. 4 and 6; however, it is representative of this shell whether the latter is made from one or from several layers of fabric.

After the fabric shell 15 is dried and stiffened into the desired shape upon the form, it is taken therefrom and cut to the general peripheral contour shown in Fig. 1 to provide ear recesses or notches 18 and 18' at opposite sides thereof to freely accommodate the ears of a person who wears the shell. Also, and preferably, the annular shell is provided with a notch 19 near the forward section thereof to insure good visibility. A similar concave notch 19' may be provided near the rear section of the shell to enable adequate and unimpeded rearward movement and turning of the head.

Instead of winding a strip or strips of uniform width fabric 16 upon a form, as shown in Fig. 7, it is possible to make the annular shell 15 from a cutout blank 20 of suitable fabric, as shown schematically in Fig. 11. This blank may be cut from a conventional strip of felt or from some woven fabric. Impregnation and shaping upon the form shown in Fig. 7 may be substantially the same as done in connection with the uniform width strips herein described in detail. When the blank 20 is of a thick material only one is required to make the shell. However, when thin material is used a plurality of separate blanks 20, or a strip of several such blanks may be placed one upon the other.

Impregnation and stiffening of the fabric 16 or 20 with a stiffening agent may be effected (1) extraneously of the form and prior to winding the fabric thereon, as by first dipping the same in a suitable tank, and then winding; (2) brushing or similarly applying the stiffening agent upon the fabric while it is being wound upon the form; (3) dipping the form with the fabric thereon in a suitable tank of the impregnation agent; (4) treating the fabric with a paste, powder or fluid form of stiffening agent; or, (5) by respectively weaving or felting in thermoplastic filament or fibers in the fabric.

Impregnation and stiffening agents for the purposes just set forth may be as follows: shellac, with considerable alcohol so that it may readily penetrate the particular fabric being used and quickly evaporate to leave a stiff fabric; Bakelite varnish, with one of its well-known thinners and driers; other now well-known natural and synthetic resins with their usual thinners and driers; fabric with all or some thermoplastic filaments or fibers.

The thinner in each instance is preferably one which evaporates quickly after the fabric is fully assembled upon the form.

If the annular shell 15 is made from a continuous strip of material it is preferably provided with a slit 21 which may be left open for maximum spreading, but which is preferably subsequently joined by a strip of resilient fabric 22 which may be connected to the ends 23 and 24 of the shell 15 as by stitching 25 or other suitable means.

In its preferred form the annular shell 15 is covered with some finishing fabric 26 to improve the appearance of the outer face, top and bottom edges of the shell, and the fabric 26 may be folded over the edges and inside of the shell as may be seen in Figs. 2 and 4. Next, a suitable padding

27 is placed within the shell and is preferably secured thereto adhesively. This padding may be of cotton, sheet sponge-rubber or the like. To facilitate the manufacture of the protector, the padding 27 is preferably blanked into the shape shown in Fig. 11 to conform generally with the interior configuration of the shell 15.

Although not essential, extra localized pads 28 are provided within the helmet and under the padding 27 (see Figs. 3 and 4) to better protect the adjacent temples of the wearer.

Further, in its preferred form a skiver of leather, or sweat 29 of fabric or the like is preferably provided to cover the padding 27 and 28, to avoid discomfort from sweating, cause the protector to grip the head, and to better hold the padding within the shell. Crisscross stitching 30 may be provided to impart a somewhat quilted effect to the skiver and padding; secure padding to the skiver or sweat; and help the skiver 29 grip the head and hair of a user.

If preferred, the padding may be adhesively secured to the sweat 29 or secured thereto by the stitching 30 whereupon the skiver and padding may concurrently be placed within the shell 15. Preferably, the skiver is provided with turned-in top and bottom ends 31 and 32 (Figs. 2 and 4) which may be adhesively secured in the positions shown in these two figures. Alternatively, the turned-in ends of the outer facing material 26 and of the sweat 29 may be secured together by overedge stitching 33, as may be seen best in Figs. 2 and 3.

The protector 14, when completed, has a general configuration as shown in Figs. 1 through 3 and may be placed upon the head of a baseball player or other person. Notches 18 and 18' provide a clearance to accommodate the ears of the user. Depending flanges 34 and 34' extend downwardly over the naturally unprotected temples close to the stronger bones such as the cheek or top jaw bones. The protector 14 just described is extremely light yet very strong. Although it is stiff enough to withstand the force of any fast flying baseball or the like it is flexible enough to accommodate itself to various shapes of heads, while the elastic connector 22 allows the shell 15 to expand and receive divers sizes of heads.

The facing material 26 and the sweat 29 may be dispensed with for economy, whereupon the padding 27, and 28 when the latter is used, may be adhesively or otherwise suitably secured to the shell 15.

Fig. 5 discloses a modified form of head protector 35 and differs from the protector 14 (Figs. 1-4) primarily in the provision of a peak 37 to facilitate removal and placing of the protector upon a person's head, and to serve as an eye-shield. Optionally, it also includes a safety top or grille 47 to close the top of the annular shell 15 and to protect the top of the head of a user.

The peak 37 (see Figs. 5 and 10 particularly) may be of fiber, or other desired material, blanked and formed to the general desired shape. If preferred, the peak may be made of green, amber or other colored Celluloid, or other translucent material which will permit a certain amount of overhead viewing of a high-flying ball or the like without looking directly into the sun's rays. Of particular importance, the peak 37 may be provided with a plurality of integral tongues or fingers 39 extending upwardly from the peak (see Figs. 5 and 10) for use in riveting or otherwise suitably securing the peak to the annular shell 15. A simple and present preferred method and structure

for accomplishing this connection is to merely insert the fingers 39 between the plies of the shell 15 when the plies are superposed upon each other. As the impregnation or stiffening agent dries and sets in the plies it serves to securely hold the peak to the shell.

Alternatively, the shell 15 may be provided with sockets 40 to accommodate the fingers 39 on the peak 37, as by withdrawing the peak and tongues after the initial setting and before the final hardening and setting of the impregnation takes place, so that the head protector may be initially sold or used without a peak 37 and the peak may later be added thereto by merely applying an adhesive upon the fingers and inserting the latter into the previously formed sockets 40.

Also, as shown in Fig. 12, the peak 37 may be removably secured thereto as by merely providing holes 41 through the shell 15 adjacent the fingers 39 and providing threaded holes 42 in the fingers 20 to accommodate holding screws 43. Thus, it would be necessary to merely slide the fingers 39 into the sockets 40 and then pass the screws 43 through holes 41 of the shell 15 and thence secure them in threaded holes 42 of the fingers 39.

Sockets 40 may be dispensed with and the holes 41 passed entirely through the fabric shell 15 whereupon the shank of the screws 43 may be passed therethrough to enter the threaded holes of the fingers 39 to draw the latter against the rear or inner surface of the shell 15 and thereby hold the peak 37 securely on the shell. With this latter construction it is desirable to provide a suitable gap or unsewed section between the shell 15 and the padding 27 (and on the sweat 29 when the latter is used) to allow the fingers 39 to be brought into place with the screw holes thereof coextensive with the holes 41 in the shell 15.

Similarly to the peak 37 just described earshields 44 of fiber or the like (see Fig. 9) may be added and connected to the protector (note the fingers 39' on the shield 44 and the finger-receiving sections 40' shown in dot-and-dash lines in Fig. 5). The left and right earshields may be made from the same blank and differ only in having the central bulged sections extend in opposite directions, as will be readily appreciated.

Fig. 6 discloses a slight modification which may be readily and advantageously built into the protector, including a convex or outward bulge 45 on the depending sections 34 and 34' as defined generally by the dot-and-dash outline 46 in Fig. 5, to provide space for more padding material at this particular point and to deflect the force of a ball or any other missile striking that part of the protector overlying the naturally unprotected temples.

The modified form of head protector 35 (Fig. 5) discloses a closure member 47 or grille preferably in the form of approximately $\frac{1}{4}$ to $\frac{1}{2}$ inch square wire mesh of sufficient strength to withstand the impact of a flying baseball or comparable missile, yet flexible enough to permit the protector to accommodate itself to divers head shapes and sizes. This member is preferably formed into the concavo-convex shape shown and is preferably provided with an integral bottom inturned edge 48 (see Fig. 4) adapted to overlie the top edge of the shell 15 to rest thereon and be secured thereto as by stitching. Preferably the latter stitching occurs only in the front half of the annular shell 15 and the closure member 47 so that the entire rear half of the annular shell may be expanded appreciably and so

that the closure member 47 will not in any way restrain the resilient action of the shell 15.

The methods of the present invention are as follows:

One method includes the steps of impregnating or treating a strip (or strips) of fabric with a stiffening agent; placing the impregnated fabric upon a form of the desired configuration, and setting or stiffening the strip of fabric to form an annular shell of the desired shape; cutting notches in the annular shell for ear and like clearance. The method may, for more elaborate or more ideal forms of protector, include the further steps of securing padding to the inside of the annular shell and/or adding a facing member to the outside of the annular shell and/or adding a sweatband over the padding and/or adding a peak to the annular shell and/or splitting the annular shell and/or joining the split sections of the annular shell with a resilient member and/or adding earshields to the annular shell. In all the foregoing, alternatively to impregnating or treating the fabric prior to its application to the form, the impregnation or treatment may be given to the fabric as or after it is placed upon the mold (e. g., by painting or dipping).

An alternative method includes the steps of cutting out a blank (or blanks) of fabric substantially to the desired final form or configuration; shaping and setting said fabric blank or blanks into an annular shell of the final general head-conforming shape; and adding a padding therein. Additionally, dependent upon the final structure desired, the method may include the further steps of adding a facing to the exterior of the annular shell and/or adding a peak to the shell and/or adding earshields to the annular shell and/or adding a sweatband over the padding and/or adding a resilient connector to join a slot in the annular shell. With this method the step of impregnating the blank with the stiffening solution or otherwise stiffening the same may take place before the blank is shaped, while it is being shaped or after it is shaped (as hereinbefore described in detail).

Alternatively to the closure member 47, the fabric strip 16 may be of sufficient width to fold over substantially the entire top 49 of the form and thereby form a top closure which will be integral with the annular shell 15 heretofore described in detail, whereupon the slot 21 at the rear of the shell will be made of sufficient height to insure the proper degree of head-fitting resiliency in the lower half of the protector. Similarly, the fabric 20 shown in Fig. 11 may be provided with a top extension 47' shown in dot-and-dash lines in Fig. 11, adapted to form the top closure member integral with the annular shell.

Felt and ordinary muslin are some of the fabrics which have been used and worked satisfactorily when forming the annular shell 15. However, woven, knit and other fabrics may be used.

Alternatively to using a natural resin such as shellac, synthetic resin and modern thermoplastics may be used in either plastic, liquid, powder or paste form to effect the impregnation and stiffening of the fabric. When a thermoplastic is used the usual conventional heat and pressures therefor are employed.

Also, alternatively to the peak 37 and top 47 which tend to convert the annular band form of protector into a peaked cap, it is possible to so convert the same by merely tacking a conven-

tional baseball cap over and onto the protector 14 with the peak protruding from the front thereof in much the same manner as the peak 37. For example, the protector 14 may be passed into the inside of a conventional baseball cap and the sweatband section of the cap may be glued to the protector 14 with the lower edge thereof on a horizontal plane substantially parallel with the top of the notches 18 which accommodate the ears. Also, the conventional sweatband may be omitted from the inside of the conventional baseball cap, whereupon the fabric of the cap may be connected directly to the protector 14. Further, if preferred, either of said conventional caps (with or without sweatband) may be passed over the protector 14, and adhesively or otherwise secured thereto, with the lower edge thereof somewhat below the highest point of the notches 18 and 19', whereupon that section of the conventional cap which depends from the protector 14 will merely be trimmed away to conform generally with the lower edge of the protector. Alternatively to adhesively securing the conventional cap to the protector 14, the lower edge of such a cap may be stitched to the lower edge of the protector 14 concurrently with the stitching 33 or another separate line of stitching very similar to the stitching 33. With any of the foregoing proposals it is preferable to split the conventional cap up the back in that section thereof immediately overlying the slot 21 so that the conventional cap will not impede the normal expansibility of the protector 14.

Other variations and modifications may be made within the scope of the invention, and portions of the improvements may be used without others.

Having thus described the invention what is claimed as new is:

1. In a head protector, the combination of an annular shell of stiffened fabric, to fit around the wearer's head, and having recesses for ears; and outwardly bulged depending sections on said shell, located forwardly of and having rear edges defining the forward portions of said recesses, adapted to overlie the wearer's temples and out of line of vision of the wearer, said bulged sections terminating at the forward portions thereof at locations rearwardly of the front of the shell and at the sides of the shell and out of line of vision of the wearer.

2. In a head protector, the combination of a shell of superposed plies of fabric, with pockets between the plies, said shell being shaped and stiffened into a generally head-conforming shape, and having notches for ear clearance and depending sections for temple protection; a peak with extensions fitting into said pockets; and a padding within the shell.

3. In a head protector the combination of an annular shell, of stiffened fabric, to fit around the wearer's head, and having recesses for ears, said shell having ends defining a split therein enabling a circumferential expansion thereof; resilient means joining said split defining ends;

depending sections on said shell to overlie the wearer's temples, said shell having inner and outer faces and top and bottom edges; an outer facing on the outer face of said shell, having top and bottom ends respectively inturned over the top and bottom edges of said shell; a sweatband facing on the inner face of said shell, having inturned top and bottom ends respectively opposed to said inturned top and bottom ends of the outer facing; and means for securing together said opposed top ends and for securing together said opposed bottom ends, of said outer and sweatband facings.

4. In a head protector, the combination of a fabric shell having a stiffening impregnation therein, to fit around the wearer's head, having a front portion adapted to extend across the forehead, and having recesses for ears, said shell at the rear thereof having ends defining a split therein enabling a circumferential expansion thereof; resilient means joining said split defining ends; and depending sections on said shell to overlie the wearer's temples.

5. In a head protector, the combination of a shell of concavo-convex shape longitudinally to fit the wearer's head, said shell being made of superposed plies of stiffened fabric, having front and rear portions with upwardly concave notches therein and having recesses for ears; and depending sections on said shell, located forwardly of and having rear edges defining the forward portions of said recesses, adapted to overlie the wearer's temples.

6. A structure according to claim 4 including earshields overlying ear recesses and having fingerlike extensions, said shell having finger-receiving sections for receiving said extensions to locate and secure said earshields relative to said shell.

7. In a head protector, the combination of a shell of superposed plies of fabric, shaped and stiffened into a generally head-conforming shape, having notches for ear clearance and depending sections for temple protection; a peak secured to said shell; earshields to overlie said ear clearance notches and having fingerlike extensions thereon, said shell having finger-receiving sections for receiving said extensions to locate said earshields relative to said notches and said shell; a closure member over the shell; and a padding within the shell.

8. A head protector adapted to be secured within a cap having circumferential expansion comprising an annular shell of stiff fabric to fit around a wearer's head and extend down over the temples, said shell having recesses at the sides for receiving the wearer's ears, upwardly concaved notches at the front and back to provide for greater visibility and comfort for the wearer, and being split from top to bottom; and resilient means connecting the split ends to provide for circumferential expansion of the shell and to hold the shell in position on the head of the wearer.

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