United States Patent [19]

Plastino

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[54] HEAD PROTECTING HEADWEAR

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[52] **U.S. Cl.** ..... **2/3 R**
[51] **Int. Cl.** **A42b 3/00**
[58] **Field of Search** 2/3, 5, 6, 181, 183

[56] **References Cited**

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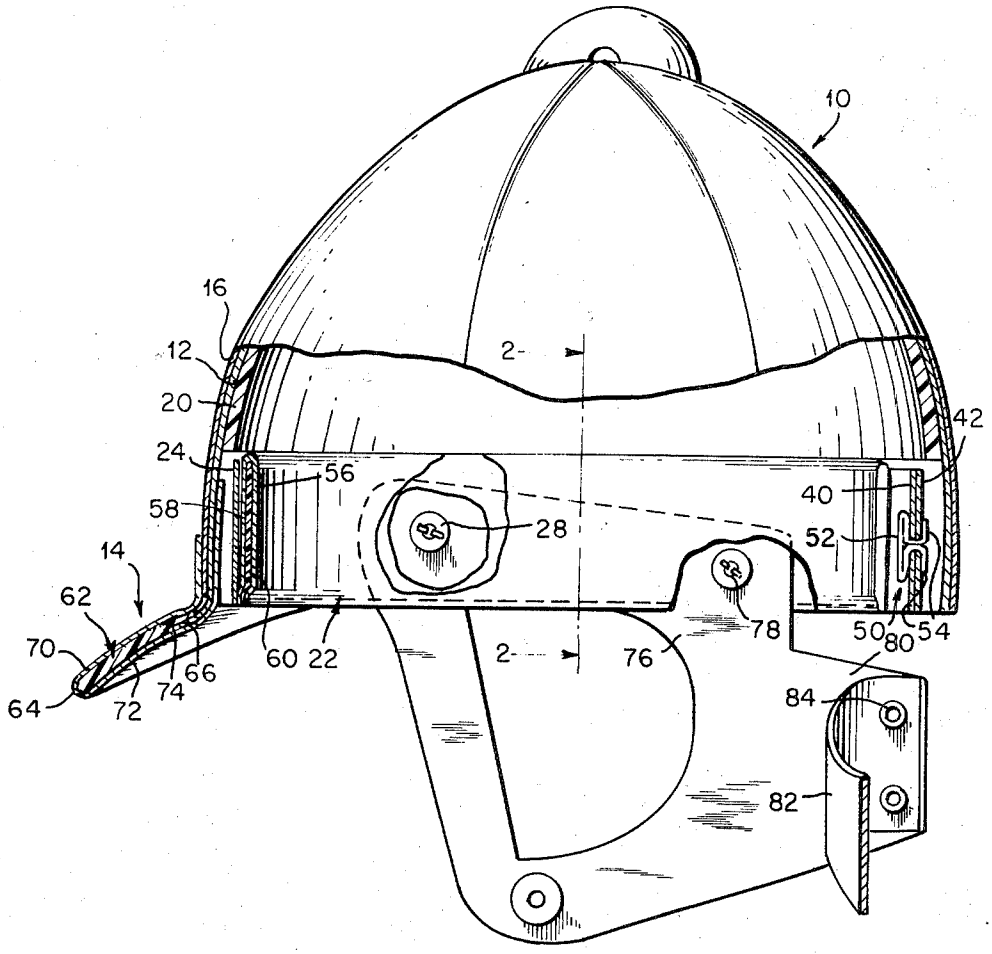
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Primary Examiner—James R. Boler
Attorney, Agent, or Firm—Gottlieb, Rackman, Reisman & Kirsch

[57] **ABSTRACT**

A peaked helmet in which the rigid outer shell is provided with an energy absorbing peak. The peak includes a stiff, crescent-shaped core formed of a close-grained, synthetic plastic sponge material, whose concave marginal edge portion is of reduced thickness and is bonded to a forwardly directed ledge extending from the front edge of the shelf by its reduced marginal edge portion.

11 Claims, 6 Drawing Figures



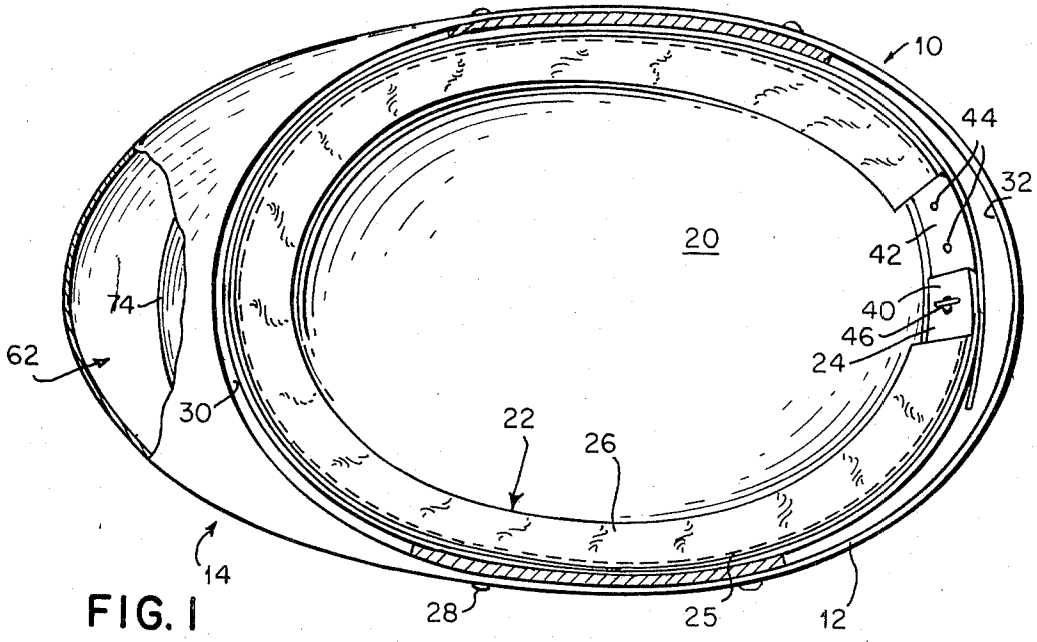

10
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25
12

FIG. 1

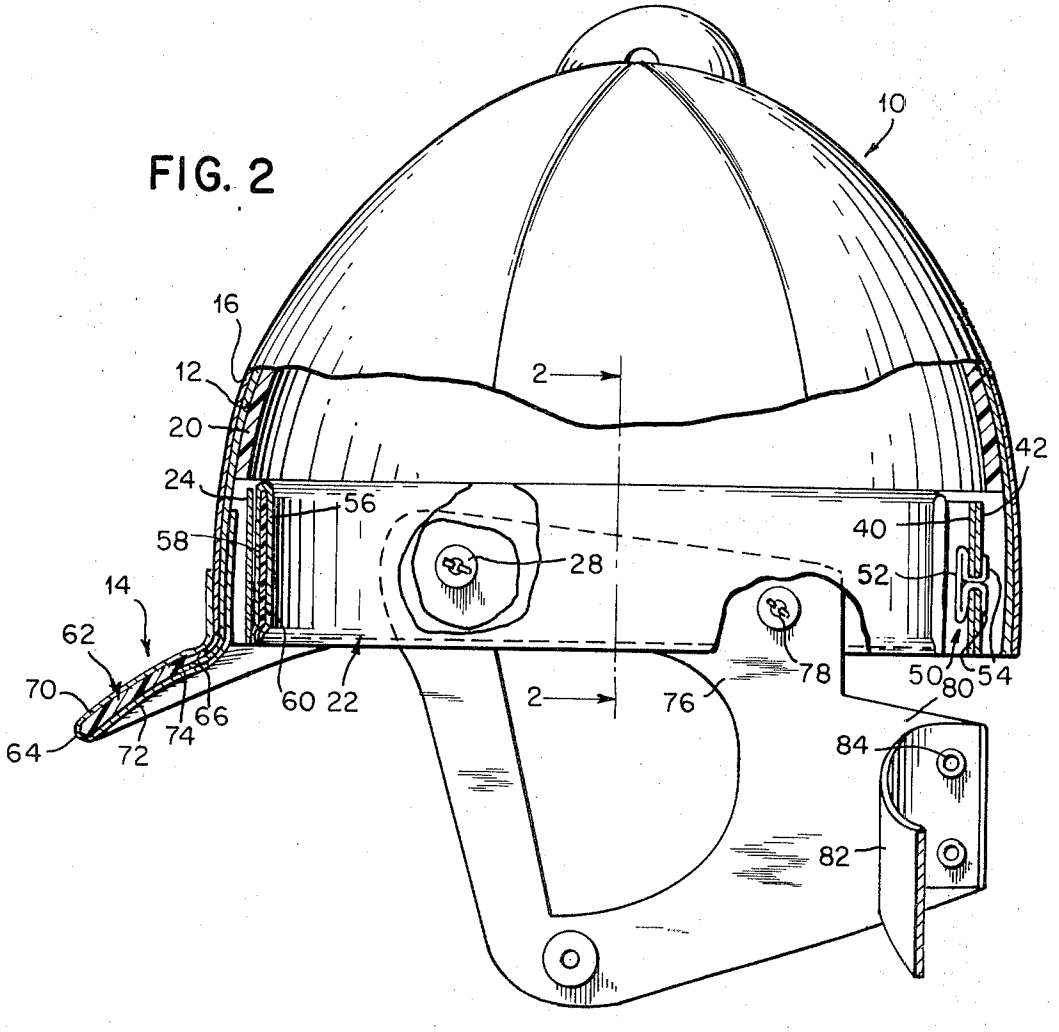

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FIG. 2

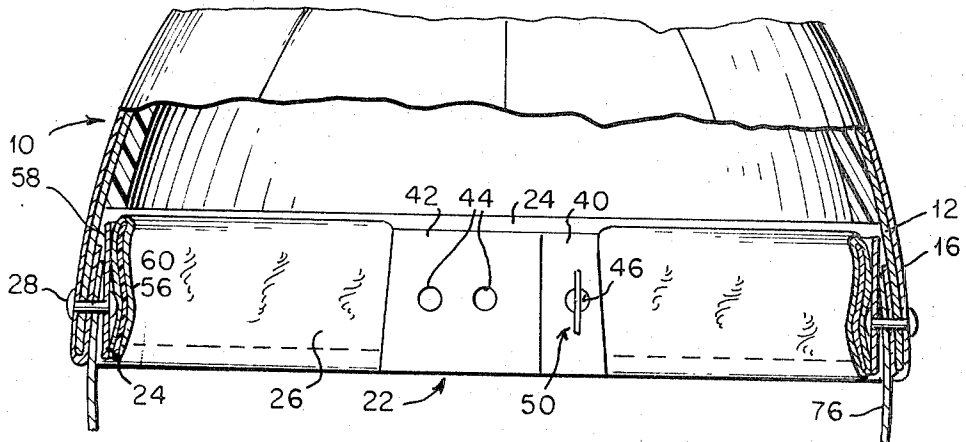


FIG. 3

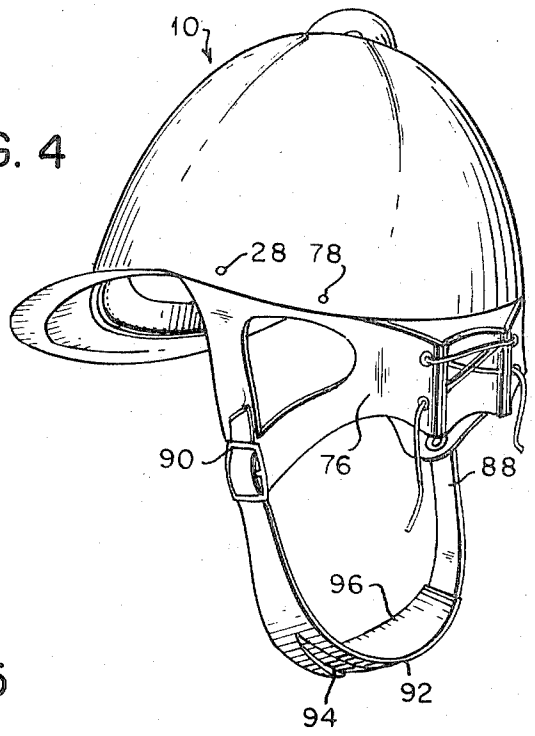


FIG. 4

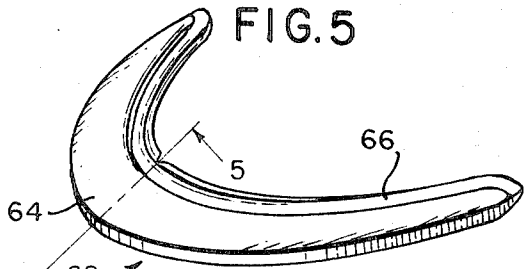


FIG. 5

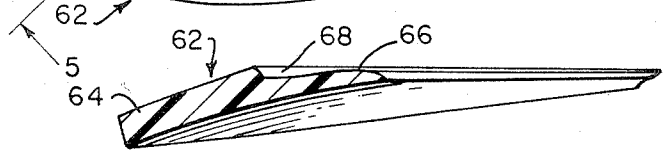


FIG. 6

HEAD PROTECTING HEADWEAR

The present invention relates to head protecting headwear, and especially to head protecting headwear, of the helmet type, such as used by equesterians, and is an extension of an improvement over my invention described and claimed in my copending application, Ser. No. 93,005, filed Nov. 27, 1970, now U.S. Pat. No. 3,706,101.

Headwear of the type to which the present invention relates, as heretofore made, generally comprises a rigid, outer head-enclosing shell, which generally contains in its interior a shock absorbing crown enclosing shell, to absorb and snub blows redeived on the crown area of the helmet and thereby protect the crown of the head.

In my copending application, I have described and claimed a helmet of the character described which also protects the front and rear of the wearer's head against injury resulting from blows struck against the front and rear of the helmet. In my said copending application, I have described a helmet provided with a floating head encirculing band at the head receiving opening of its shell; such band being of a circumference less than the circumference of the head receiving opening of the helmet and being secured to the helmet along its sides, in a manner to provide a gap between the band and the front and rear of the helmet shell.

The present invention is directed to the provision of head protecting headwear or helmets which will afford even greater protection against blows struck at the front of the helmet to absorb and snub the same to a greater extent than possible with helmets of the prior art and which will be particularly effective to afford the greater protection to the eyes of the wearer against blows struck on the front of the helmet.

It is an object of the present invention to provide improved helmets, of the character described, that provide such additional protection by relatively simple means that do not involve any departure from conventional shape and appearance of the helmet; which do not materially affect the weight thereof on the head nor materially increase the cost of production thereof.

Generally stated, the invention resides in the provision on head protecting headwear of the character described of a visor which, though normally stiff and retaining its shape, is stiffly compressable and shock absorbing and also yieldable to be deflected under the shock of a blow against it to be depressed toward the wearer's face and thereby not only enhance its snubbing effect but also, because it is deflected towards the face at approximately the level of the eyes, affords protection for the eyes not obtainable with prior art helmets.

The foregoing and other objects and advantages of the head protecting headwear of the present invention will become more readily apparent to those skilled in the art from the embodiment thereof shown in the accompanying drawings, and from the description following. It it to be understood, however, that such embodiment is shown by way of illustration only, to make the principles and practice of the invention more readily comprehensible and without any intent of limiting the invention to the specific details therein shown.

In the drawings:

FIG. 1 is a bottom plan view of one embodiment of a head protecting article of headwear of the present invention; partly broken away to show details of construction;

FIG. 2 is a side elevational and partly vertical sectional view of the same;

FIG. 3 is a fragmentary, vertical sectional and partly elevational view of the article, taken along line 2—2 of FIG. 2;

FIG. 4 is a perspective view of the head protecting article with the chin strap shown in full;

FIG. 5 is a perspective view of the inner visor-reinforcing element of the article of the present invention; and

FIG. 6 is a section taken on line 5—5 of FIG. 4.

Referring now, in greater detail, to the embodiment of the invention illustrated in the drawings, the same show a head protecting article of headwear, in the form of a riding cap, generally designated as **10**, consisting of an outer shell, **12**, preferably formed of a rigid, shock resistent material, such as rigid synthetic plastic or a metal, and a peak or visor, generally designated as **14**, extending from the front of the shell **12**. While the illustrated embodiment shows a shell **12** as provided with an exterior decorative fabric cover, **16**, it will be readily understood that the present invention may apply to any other form of head protecting gear, such as cyclers' or workers' helmets, in which at least the exterior covering **16**, may be eliminated and replaced with another form of surface decoration, such as a coat of colored enamel, or the like.

The outer shell **12**, houses in its interior a head crown enclosing, protective shell, **20**, having shock absorbing characteristics. While any form of such buffer shell, conventionally used in like articles of the prior art, may be utilized in connection with the headwear of the present invention, I prefer to use a shell **20** formed of stiffly compressable material, such as close-grain polystyrene foam, formed of expandable granular polystyrene. As conventional, the crown protecting shell **20** has the edges of its opening terminate short of the edges of the opening of the outer shell **12**, generally at a point approximately on a level with the inner edge of a head-band that is generally secured to the marginal edge portion of the opening of shell **20**, which head-band, in the illustrated embodiment, is generally designated as **22**.

Head-band **22** comprises an inner, shell-supporting band, **24**, formed of a material that is stiffly flexible, as of relatively thick polyethyne sheet material, as of approximately 1/16 inch or slightly lesser thickness. Such band, while longitudinally readily flexible, is transversely stiff and may be relatively easily and economically produced, as by cutting from large sheets of such material. Band **24** may be of conventional width and has secured to its outer or lower edge, as by stitching **25**, the lower edge of the sweat-band strip, **26**. Band **24** is secured to the sides of the outer shell **12**, preferably by clamps or rivets, **28**, in a manner to leave a space, **30**, between the front of the outer shell **12** and the band, **24**, and a space, **32**, between the rear of the shell **12** and the band **24**.

To render the head-band **22** of the present invention adjustable for various head sizes, the band **24** may be provided with overlapping ends, preferably at a point at the rear of the outer shell **12**; such ends being designated as **40** and **42** (FIG. 1). These ends **40** and **42** may be adjustably interengaged in any desirable manner and by any suitable means to vary the band circumference

to fit different head sizes. In the illustrated embodiment, the means for adjustably interengaging the overlapping band ends **40** and **42** comprises a series of longitudinally spaced openings, **44,** formed in at least one of the band ends, as **40,** and at least one opening, **46,** formed in the outer of the overlapping band ends. The overlapping band ends **40** and **42** may be adjustably interengaged by means of a suitable clip, generally designated as **50,** which may be passed through the opening **46** and a selected one of openings **44.** Preferably, in order to avoid possible head damaging bulges of the clip **50,** the latter may be made in the form illustrated, from a strip of dead-bend metal, to provide the flat head portion **52** and the foldable leg portions **54.**

To permit access to the overlapping ends **40** and **42** of the band **24,** for purposes of adjustment of its length and to avoid uncomfortable bulges in the sweat-band strip **26** that may be consequent upon adjustment of band **24,** sweat-band strip **26** may be noncontinuous and may have its ends terminate at the perforated portions of the band ends **40** and **42.**

For the wearer's comfort, sweat-band strip **26** may be soft and compressable in thickness, as by being formed of an outer fabric or leather ply, **56,** and an inner thin plastic sheeting ply, **58,** and an intermediate ply of padding, **60,** which may comprise polyurethane or like sponge material.

To protect the wearer of the helmet against neck injury, due to severe and sudden shock against the front of the helmet, as well as against injury to the upper face portion and the eyes that might result from such blows, the present invention provides for such peak to comprise an inner element or insert, or core, generally designated as **62,** formed of energy absorbing material, such as non-rigid but stiff and stiffly compressable material that will bend under impact, such as high impact, close-grained, synthetic sponge material. One such material suitable for the purpose is available on the market under the trade name as "Ensolite." Element **62** may be molded in crescent shape and may be of substantial thickness along its forward area, **64,** as about one-quarter inch thick, so as to make it relatively rigidly stiff, and may be formed with an inner, relatively narrow, marginal edge portion, **66,** at its concave or inner edge, of lesser thickness, forming a shoulder, **68,** between the two core portions. Element **62** is preferably enclosed in a pocket-like cover formed by upper and lower fabric cover sections, **70** and **72,** whose marginal edge portions at its opening overlap the inner portion **66** of element **62.**

To secure the peak **62** in place, rigid shell **12** is formed at its forward end with an integral narrow ledge, **74,** and the inner marginal edge portion **66** of element **62** is arranged to overlap ledge **74,** preferably from above, and is bonded thereto. The overlapping cover portions **70** and **72** are then secured to the shell **12** or to its covering.

It has been ascertained that a peak having a core **62,** such as described, while it is sufficiently rigid to serve its purpose of manipulating the helmet on and off the head, is also highly efficient as shock absorbing means, because of its inherent compressability under shock and because of its flexible yieldability at the point of demarcation between portions **64** and **66** where it is of reduced thickness. Also, because it is flexibly yieldable at that point under the pressure of a shock against it, the peak will fold downwardly over the face to serve as a protection for the eyes and the upper part of the face.

The helmet of the present invention may be provided with a chin strap to maintain it in adjusted position on the head, to the size and shape of which it may itself be adjusted. In the embodiment of the invention illustrated in the drawings, such chin strap is shown to comprise a pair of flaps, each generally designated as **76,** each of roughly triangular shape and dependently secured to one side of the helmet, between the outer shell **12** and the head-band **22.** Each flap **76** is secured to the shell **12** by its base portion, preferably at two points; namely at its forward corner on the rivet **28,** securing the band **24** to the shell **12,** and adjacent its rear corner by a second rivet, **78.** Each flap **76** is formed with a band extension **80,** extending from its rear edge, preferably at a point below the edge of the shell **12.** The ends of the extensions **80** are joined by a connecting piece, **82,** each end of which is reentrantly folded against the inner face of the end of an extension **80** and is secured thereto. Eyelets **84** are formed through each joined end of each extension **80** with connecting piece **82,** through which a lace **86,** may be passed to adjust the space between the ends of the flap extension **80** to fit the size and shape of the head of the wearer at a point below the helmet, shen worn on the head.

A strap **88** is secured by one end, to the lower end of one of the flaps **76;** its other end being adjustably securable in a buckle **90** secured to the lower end of the other flap **76.** Chin-cupping means may be provided on strap **88** which may consist of an appropriately located widened portion **92** in which is formed a chin receiving opening, **94,** that may be covered by a fabric portion **96,** that forms a cup for the chin end.

It may here be stated that the peak or visor of the present invention may be used in association with a head protecting helmet independently of the floating head band described herein and that when so used, it will enhance the safety characteristics due to its inherent compressability and by further reason of its flexible connection to the helmet, as hereinabove explained.

This complete the description of the head protecting headwear or helmet of the present invention. It will be readily apparent that such headwear will provide enhanced protection against head, neck and upper face injury to the wearer. It will also be apparent that such headwear may be worn with increased comfort and that it will not differ in appearance from similar helmets of the prior art nor involve any substantial difference in the weight thereof. It will be additionally apparent that the helmet of the present invention may be produced at relatively little or no increase in cost over similar helmets of the prior art.

It will further be apparent that numerous variations and modifications may be made in the head protecting headwear of the present invention, by anyone skilled in the art, in accordance with the principles of the invention hereinabove set forth, and without the exercise of any inventive ingenuity.

What I claim is:

1. Head protecting headwear comprising a rigid outer shell having a head receiving opening, said shell having a relatively narrow ledge extending from its forward edge at a downwardly and outwardly sloping angle relative thereto and forming a base for a peak and a peak for said shell including a core formed of stiff energy absorbing material, said core being of crescent shape and

having an outer relatively thicker portion and a marginal portion of relatively reduced thickness along its inner concave edge, said core disposed with its said relatively thinner marginal edge portion overlapping said ledge and bonded thereto.

2. The headwear of claim 1, wherein said core is formed of a non-rigid stiff and stiffly compressable bendable material.

3. The headwear of claim 2, wherein said material comprises high impact, close-grained, synthetic sponge.

4. The headwear of claim 1, wherein said relatively thinner marginal edge portion of said core is offset relative to a surface of said core and overlies said ledge.

5. The headwear of claim 4, wherein said core is disposed within a pocket of substantially corresponding shape, with its concave edge facing the opening of said pocket, said pocket having marginal edge portions of its opening project beyond said core, said projecting marginal edge portions secured to said shell.

6. The headwear of claim 5, wherein said shell is provided with a head engaging band connected thereto within the head receiving opening thereof, said head engaging band comprising a longitudinally flexible and relatively transversely stiff band of lesser circumference than the head receiving opening of said shell, means connecting said band to said shell at the sides of said shell in a manner to leave a space between said band and said shell at the front and rear thereof, and a sweat band connected by its lower edge to the lower edge of said band.

7. The headwear of claim 6, wherein said means connecting said band to said shell comprises a rivet extending through said band and said shell.

8. The headwear of claim 6, wherein said band is formed with overlapping end portions and means are provided for adjustably interengaging said end portions of said band to thereby vary its circumference for wear on heads of various sizes.

9. The article of headwear of claim 7, wherein said sweat band is non-continuous and has its ends terminate short of the overlapping end portions of said band.

10. The headwear of claim 7, including chin engaging means, said chin engaging means comprising flaps of pliable sheet material secured by one edge in dependent relation to said shell between said shell and said head band, at each side of said shell on said rivet, and at a second point by a rivet extending through said flap and said shell; each said flap having a rearwardly directed extension at a point below the edge of the head receiving opening of said shell, adjustable means connecting the ends of said extensions, one of said flaps having a strap connected thereto at its lower end, the other of said flaps having means for adjustably receiving the free end of said strap.

11. The headwear of claim 10, wherein said strap is provided with means for receiving the end of the wearer's chin.

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