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(54) **BALL CAP SHIELD**

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(57) **ABSTRACT**

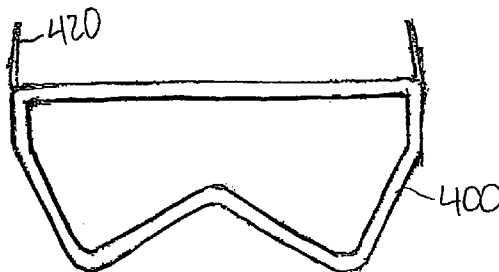
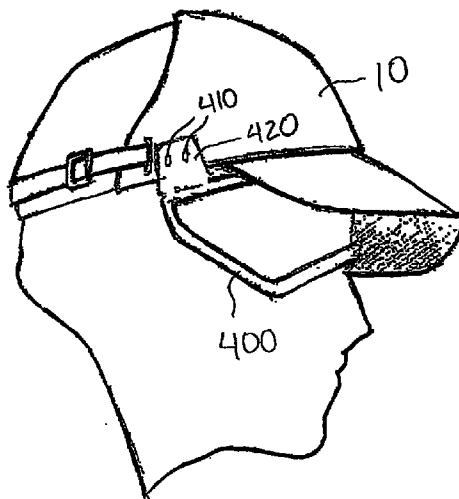
Related U.S. Application Data

(63) Continuation of application No. 10/948,057, filed on Sep. 23, 2004.

A shield adapted for use with a baseball cap or caps used in other sports is disclosed to protect a pitcher or fielder from a batted or thrown baseball or softball. A panel is shaped to conform with a front side of a ball cap and is secured with straps or other means on the outer side of the ball cap or, alternatively, on the inner side of the ball cap. The shield is formed of a sheet or panel of impact absorbing plastic that protects the user from trauma in the event of a collision with a traveling ball or other object.

(60) Provisional application No. 60/506,447, filed on Sep. 26, 2003.

optional eyeguard



pitching shield

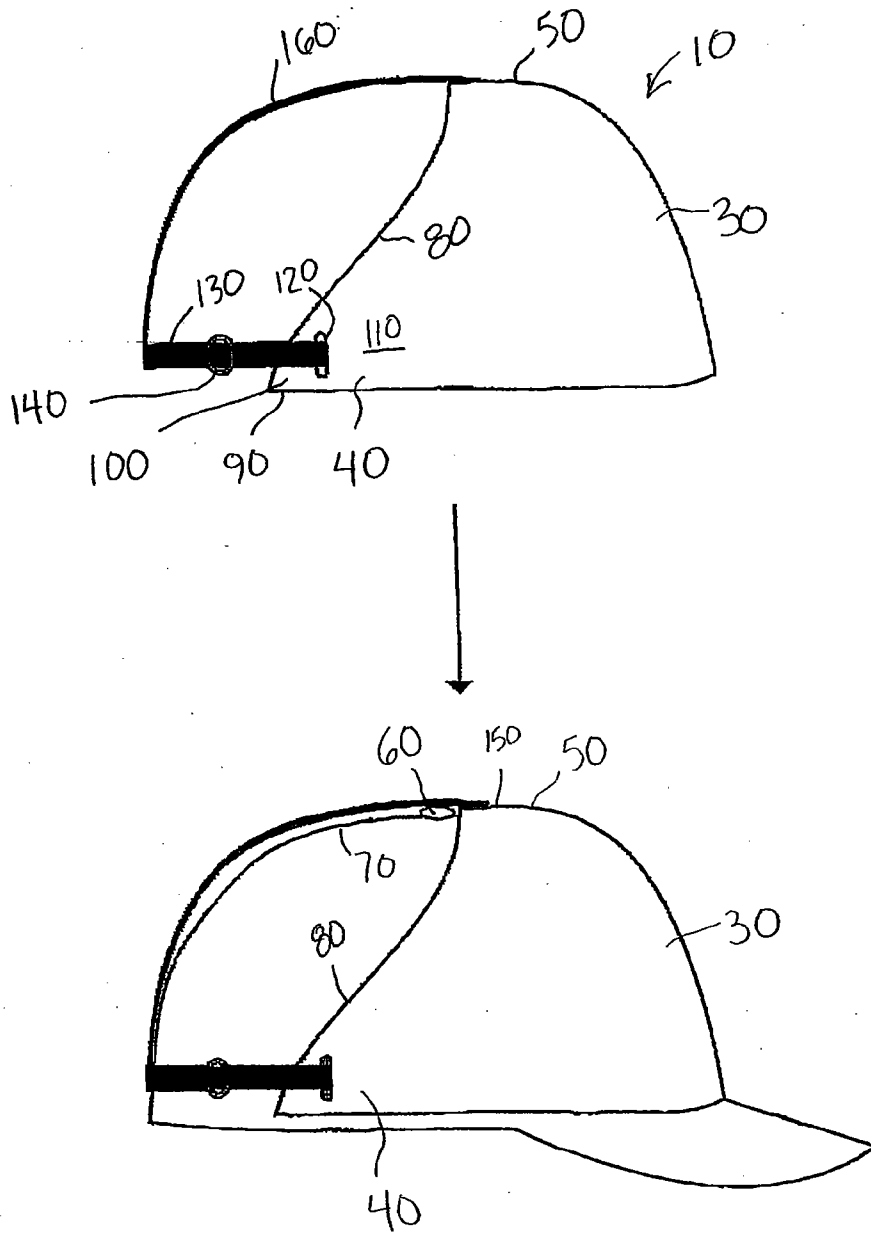


FIG. 1

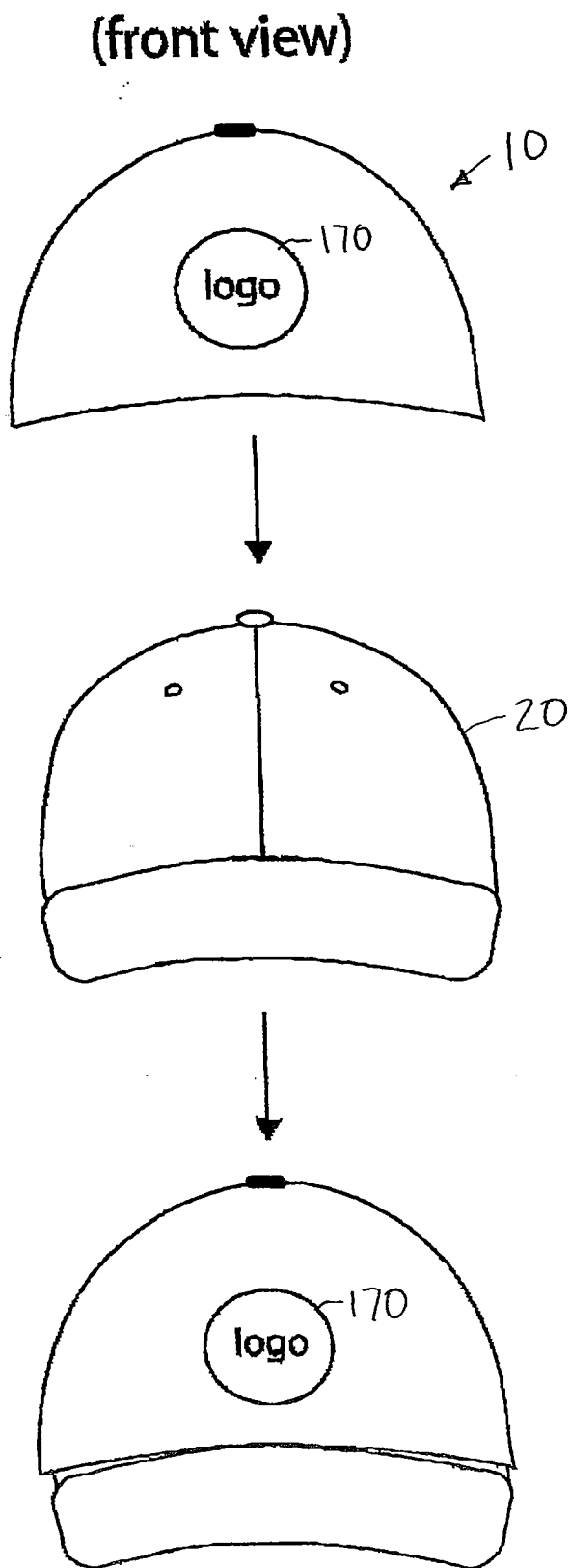


FIG. 2

(rear view)

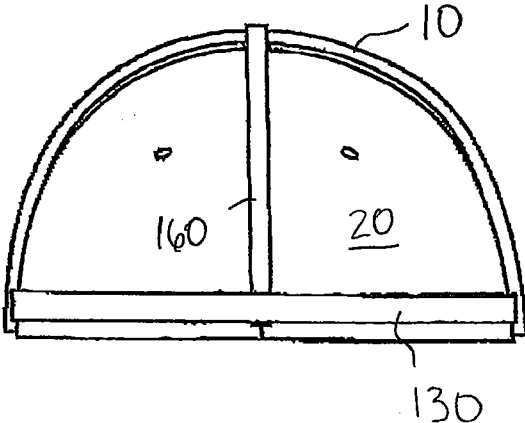
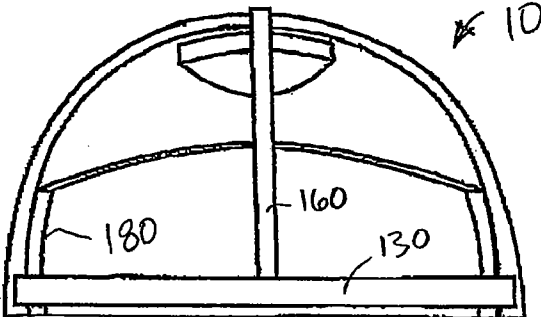


FIG. 3

2nd option

(velcro the shield inside the hat)

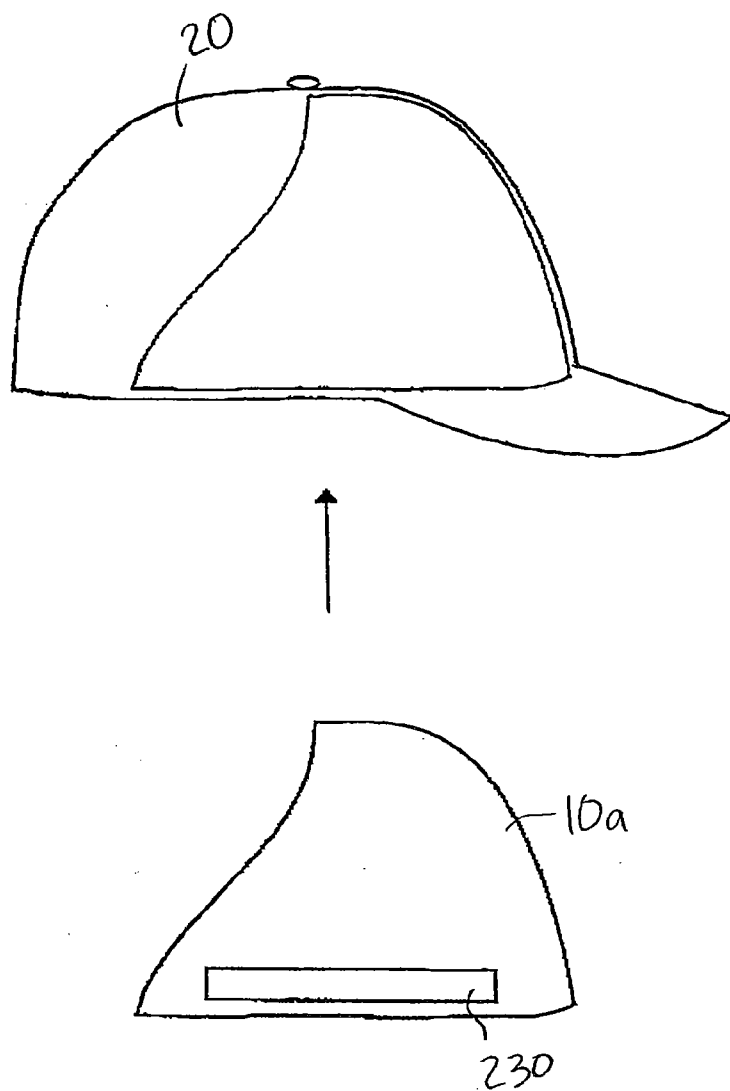


FIG. 4

(bottom view)

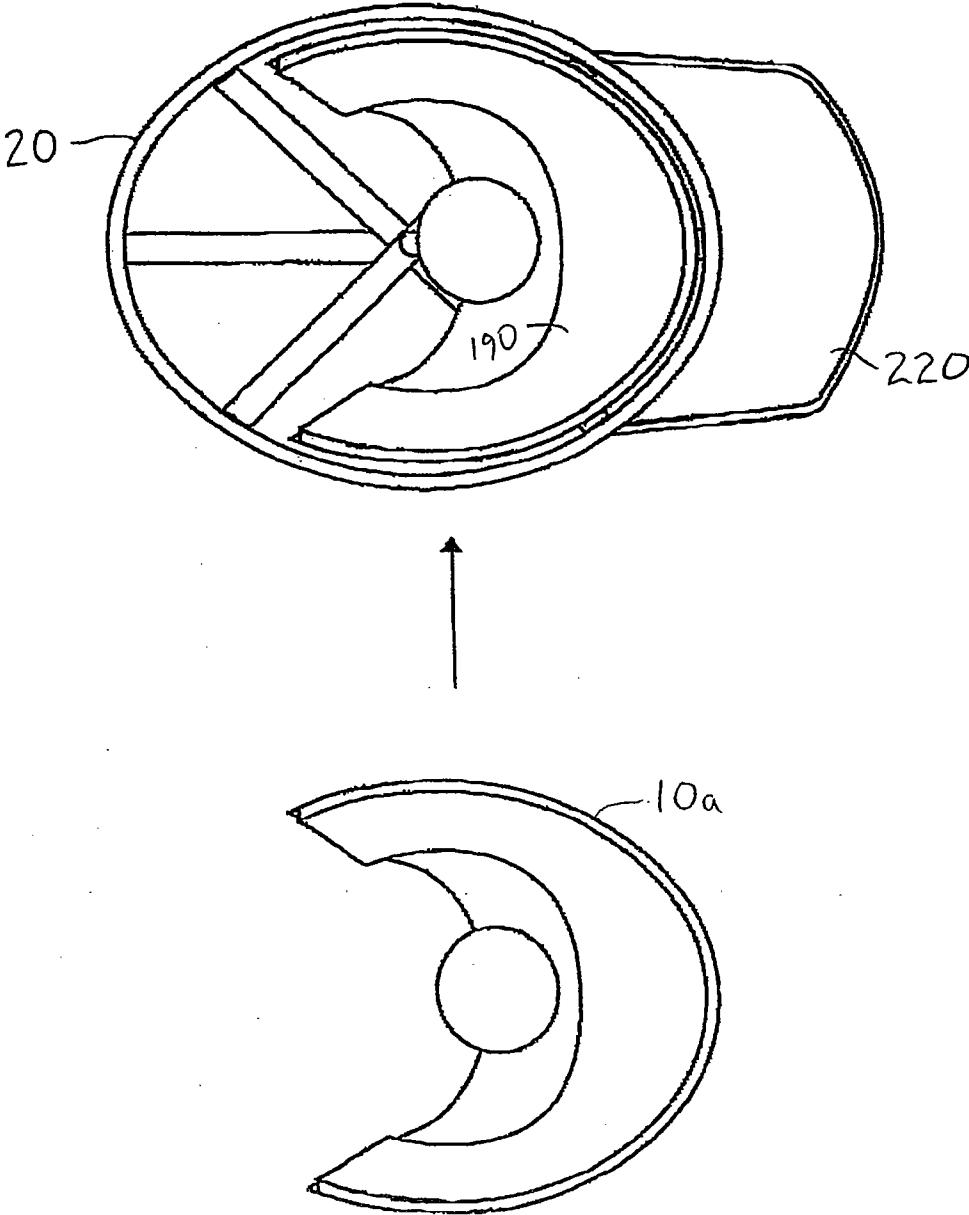


FIG. 5

3rd option

(stitched within the hat)

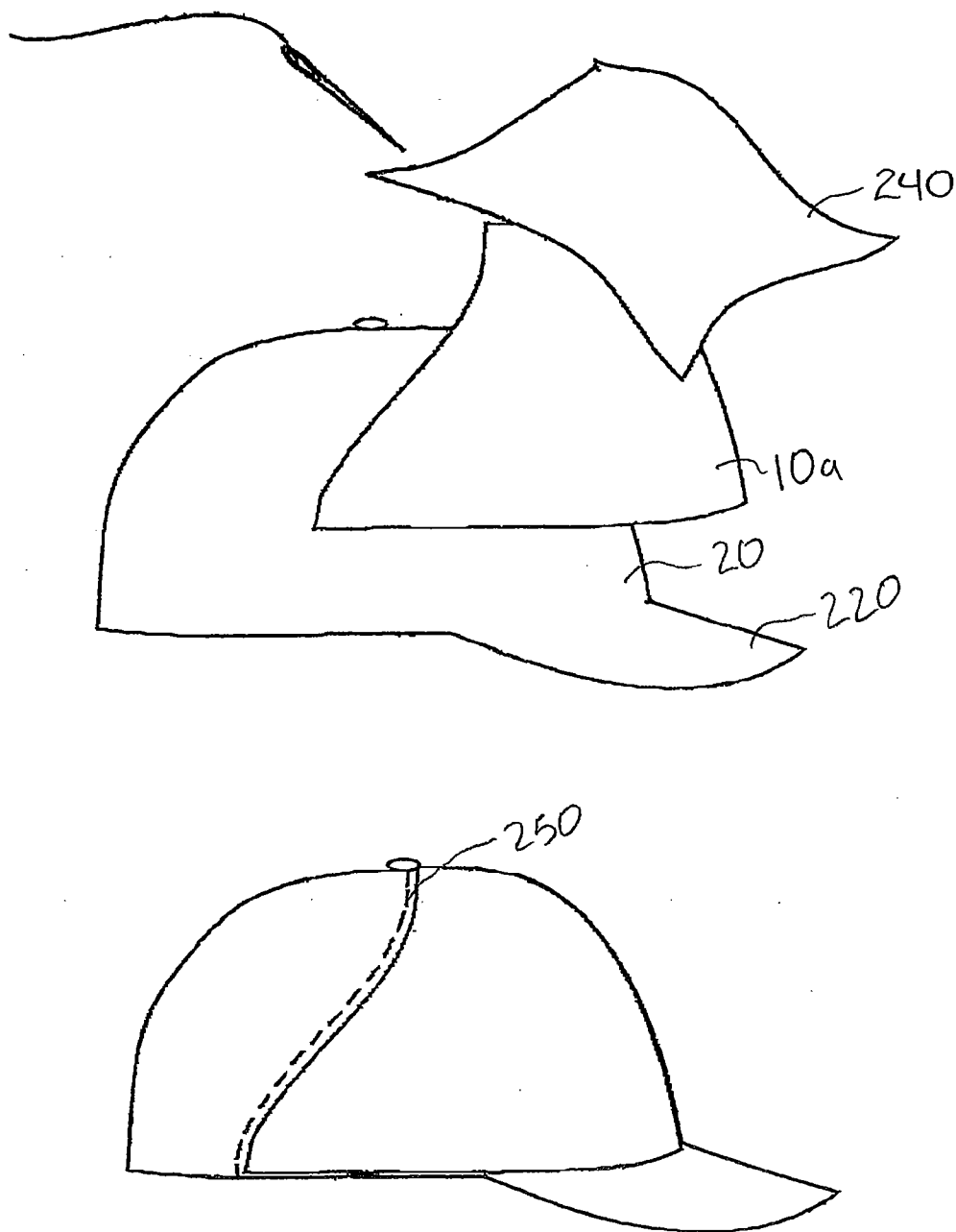


FIG. 6

pitching shield (with ear flaps)

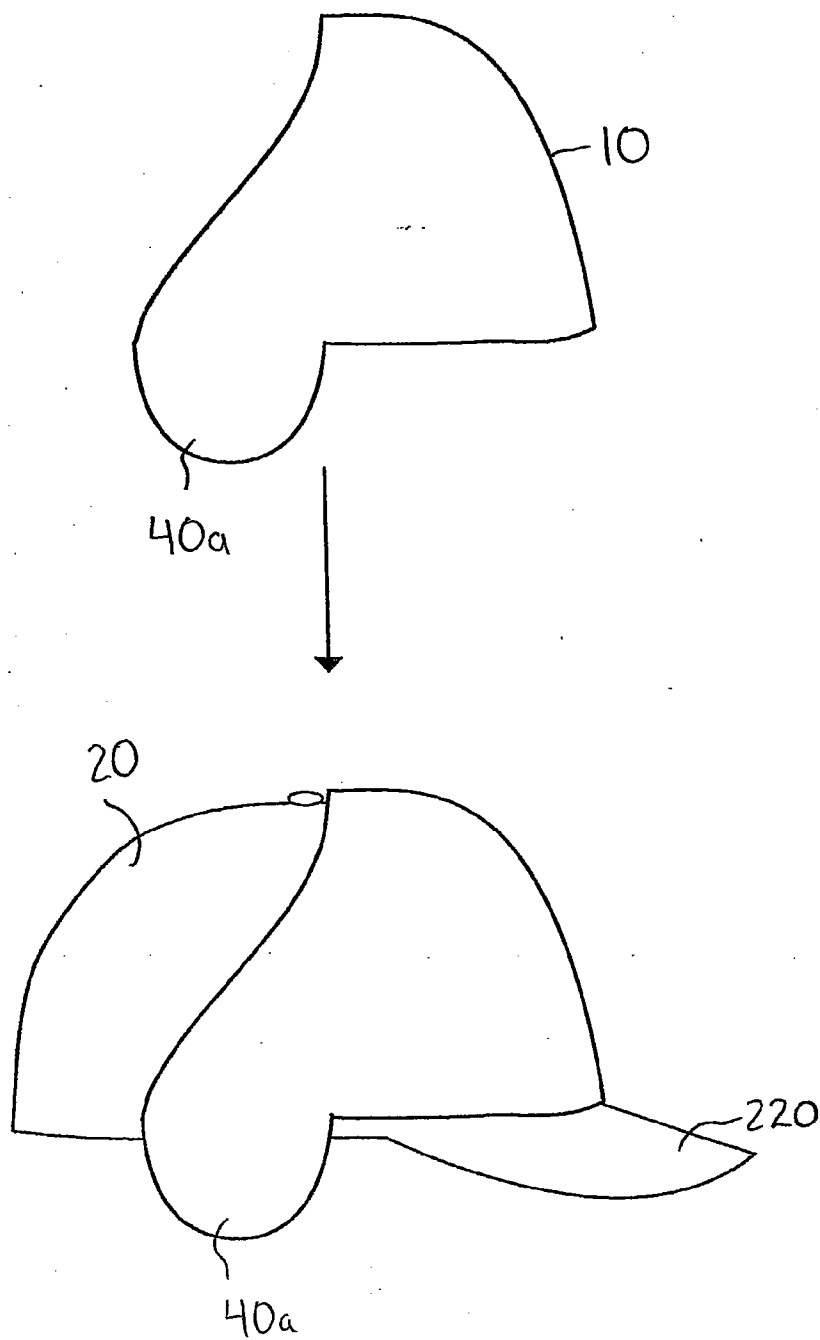


FIG. 7

(velcroed to the hat)

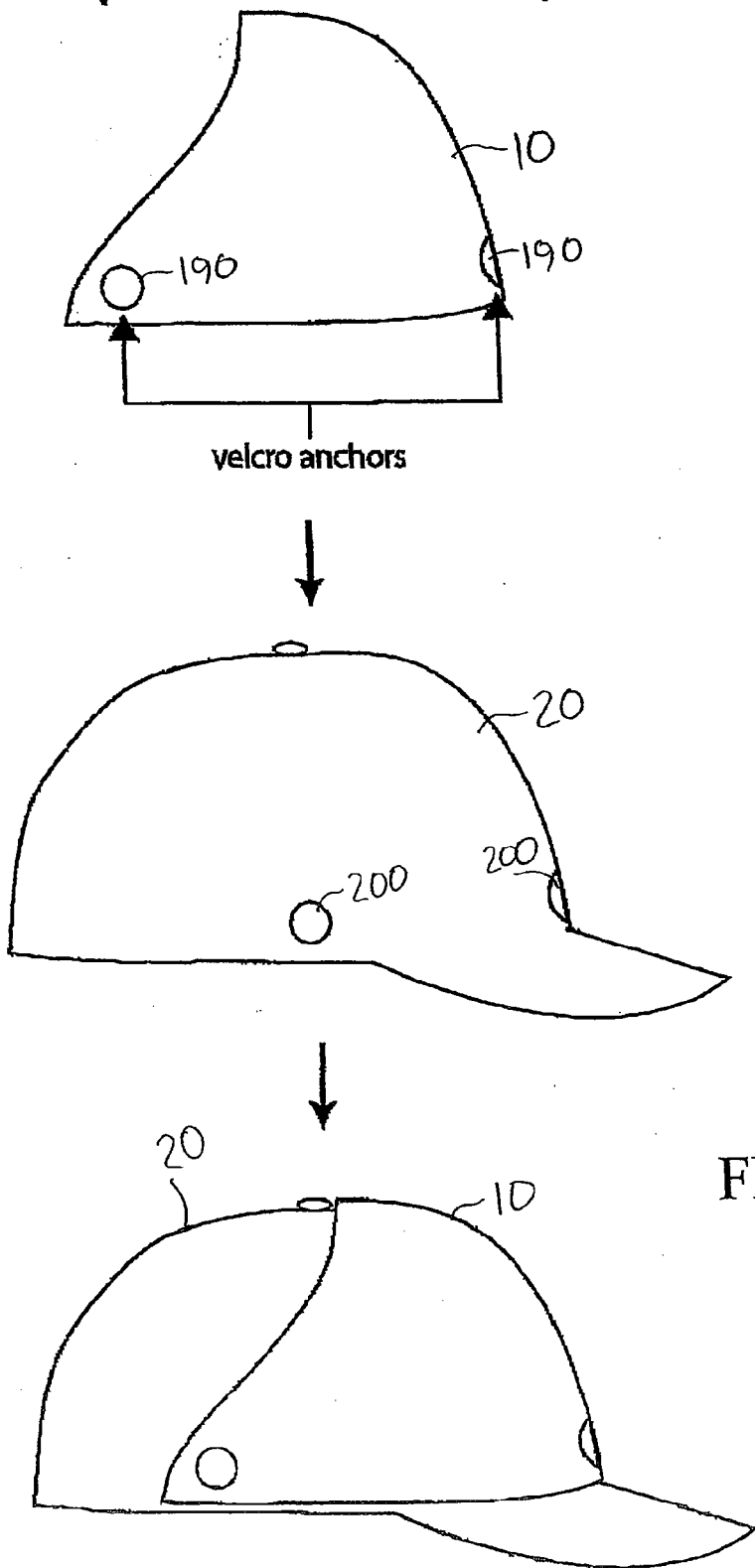


FIG. 8

(protective shield w/bill)

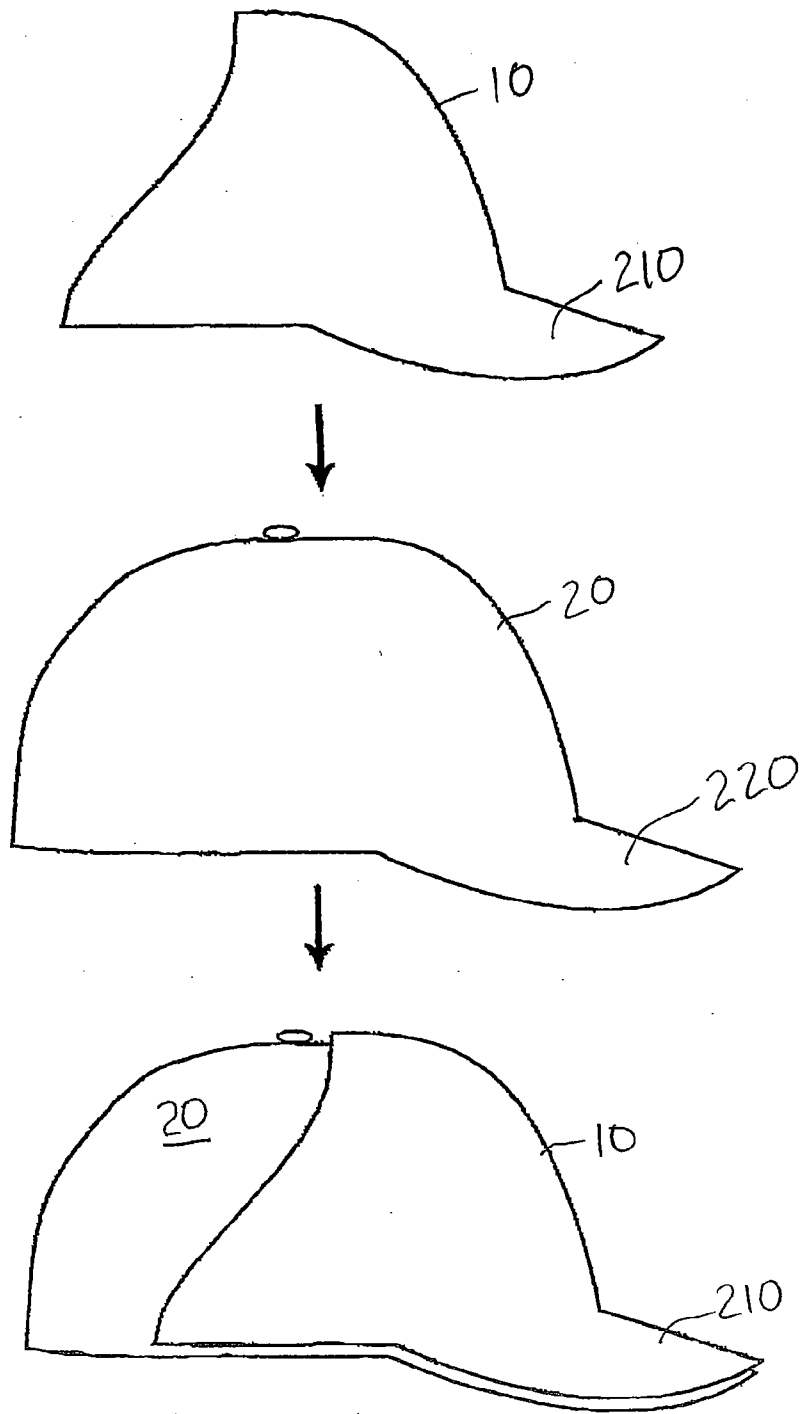


FIG. 9

(protective shield w/1 in. bill)

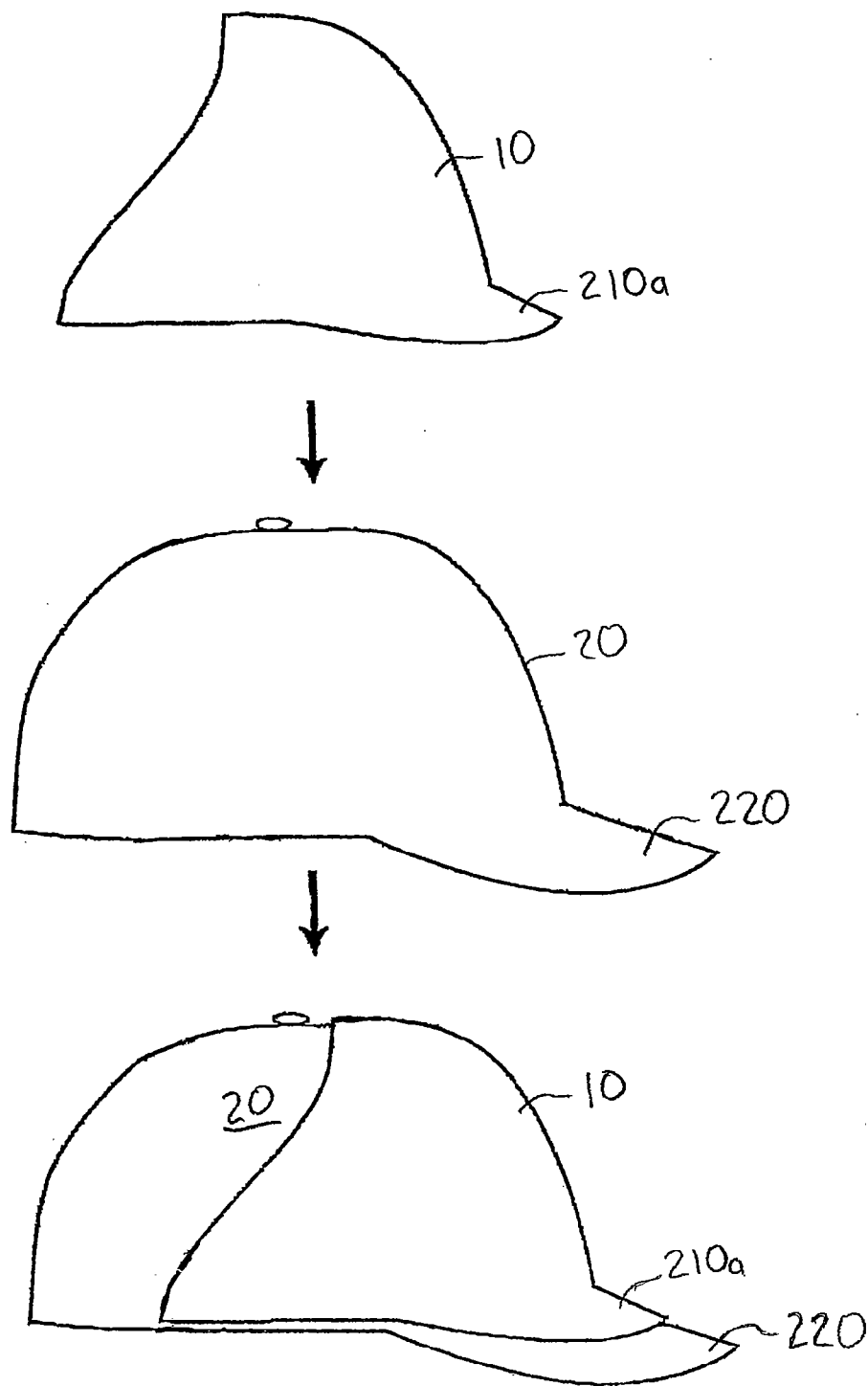


FIG. 10

(velcro kevlar sections inside the hat)

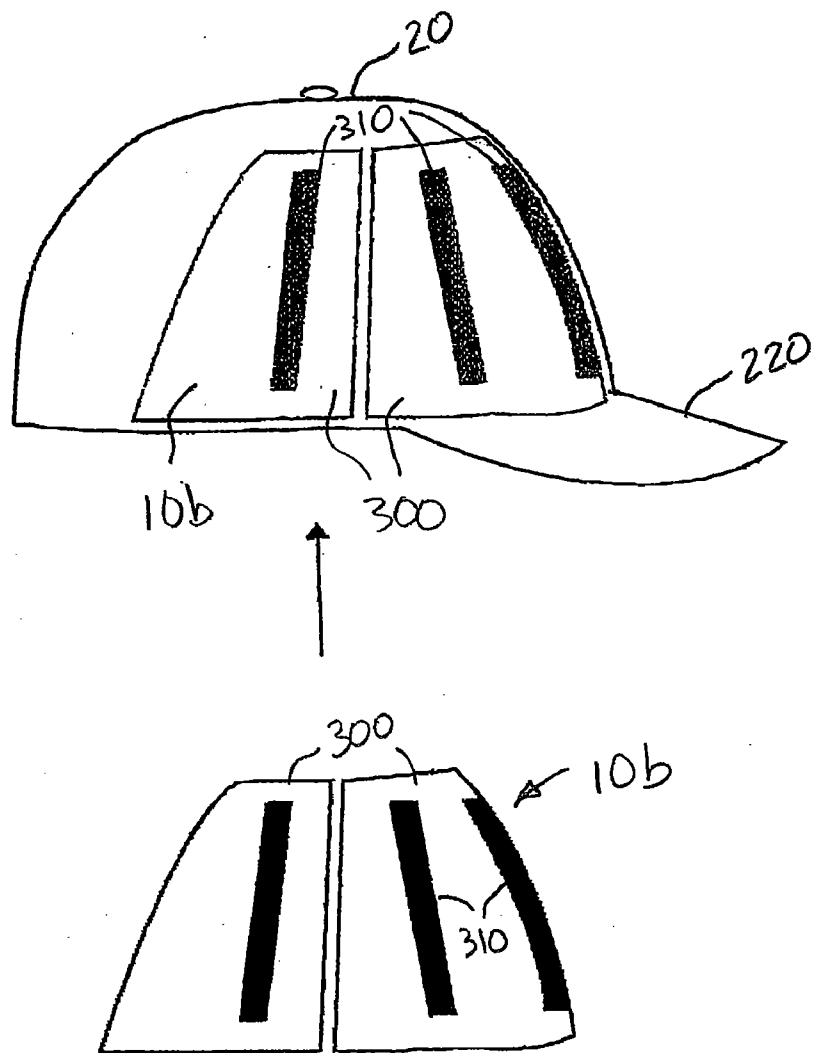


FIG. 11

(bottom view)

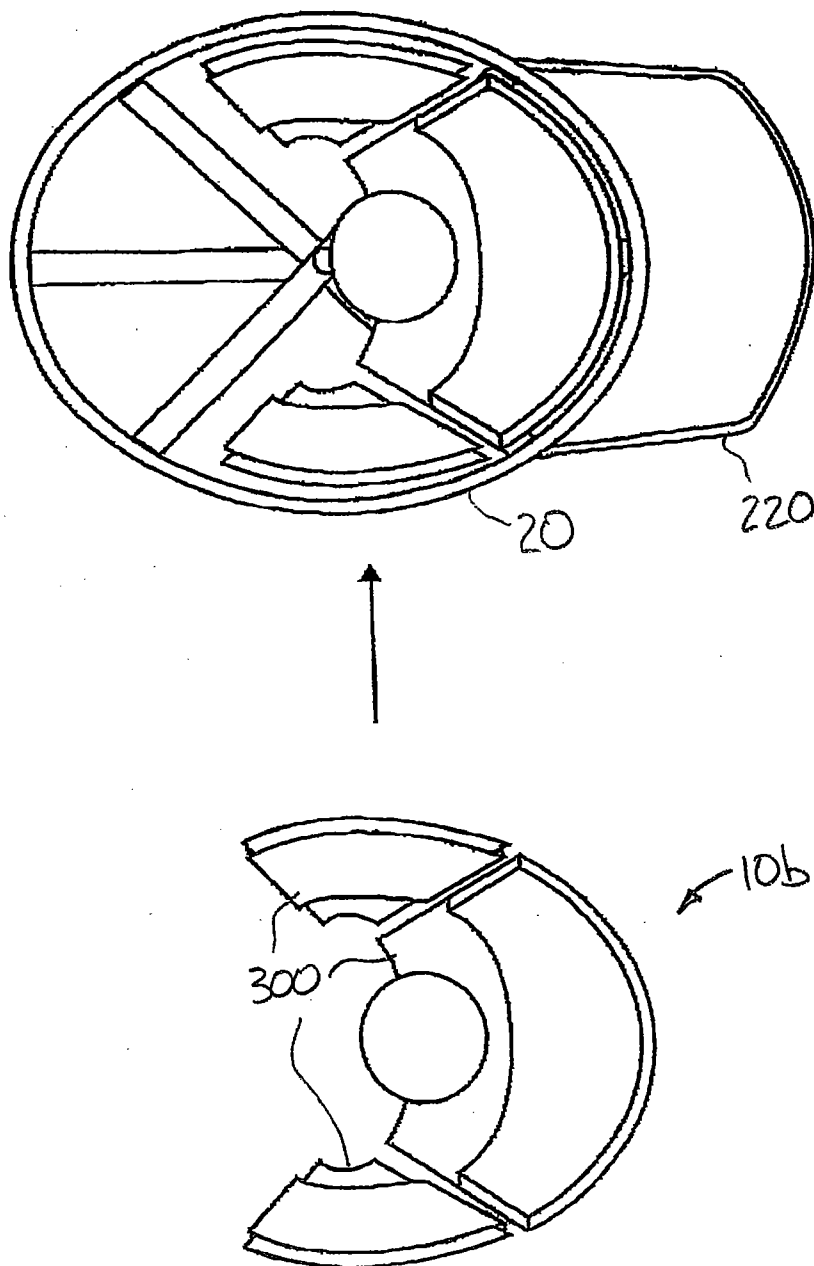


FIG. 12

pitching shield (reinforced with gussets)

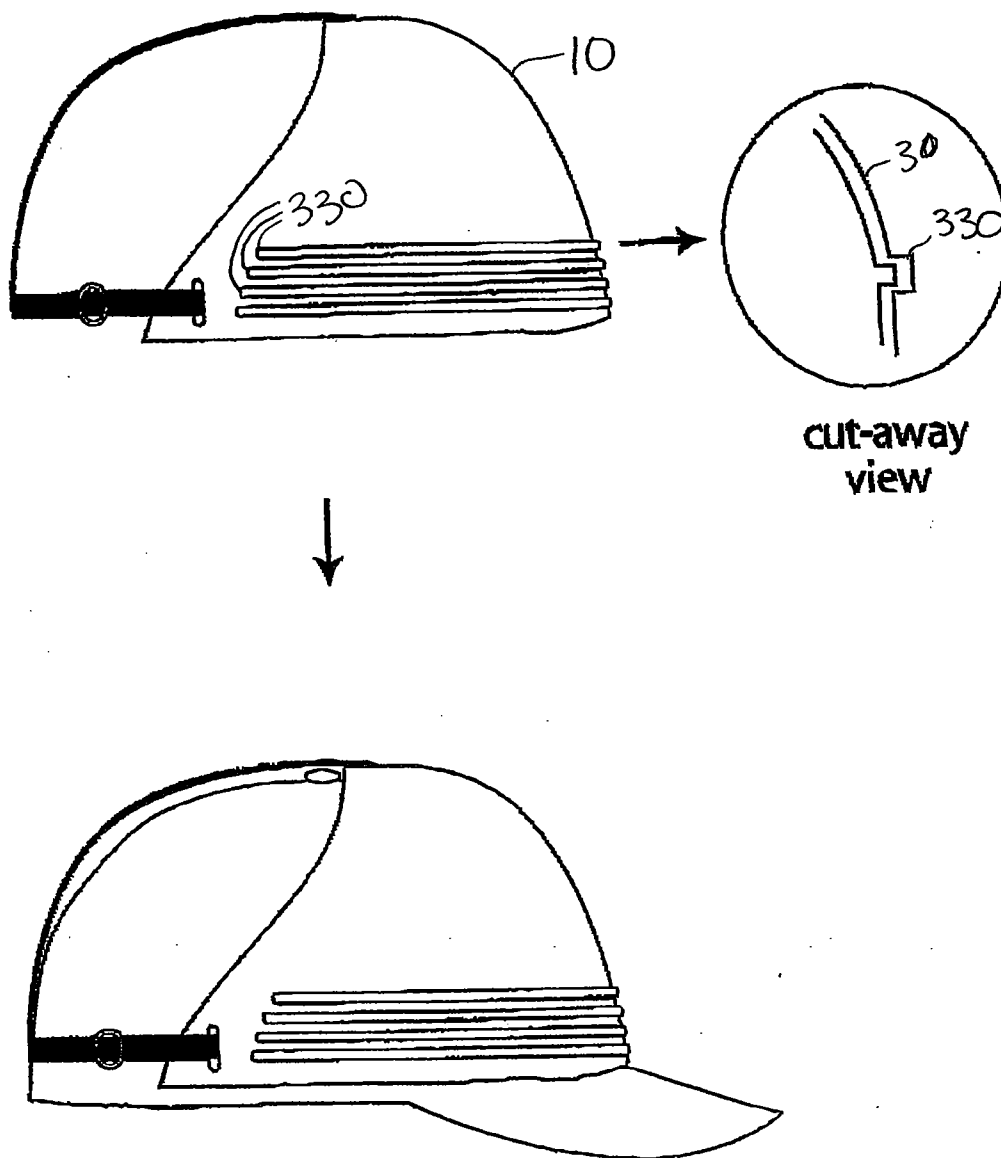


FIG. 13

optional eyeguard

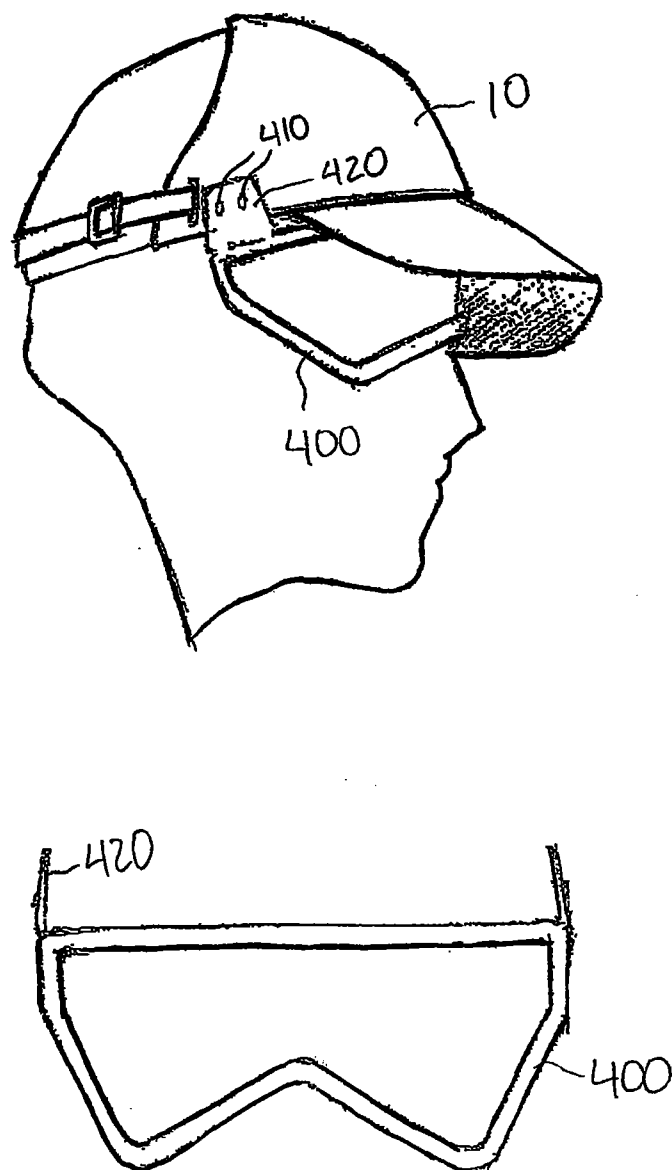


FIG. 14

pitching shield

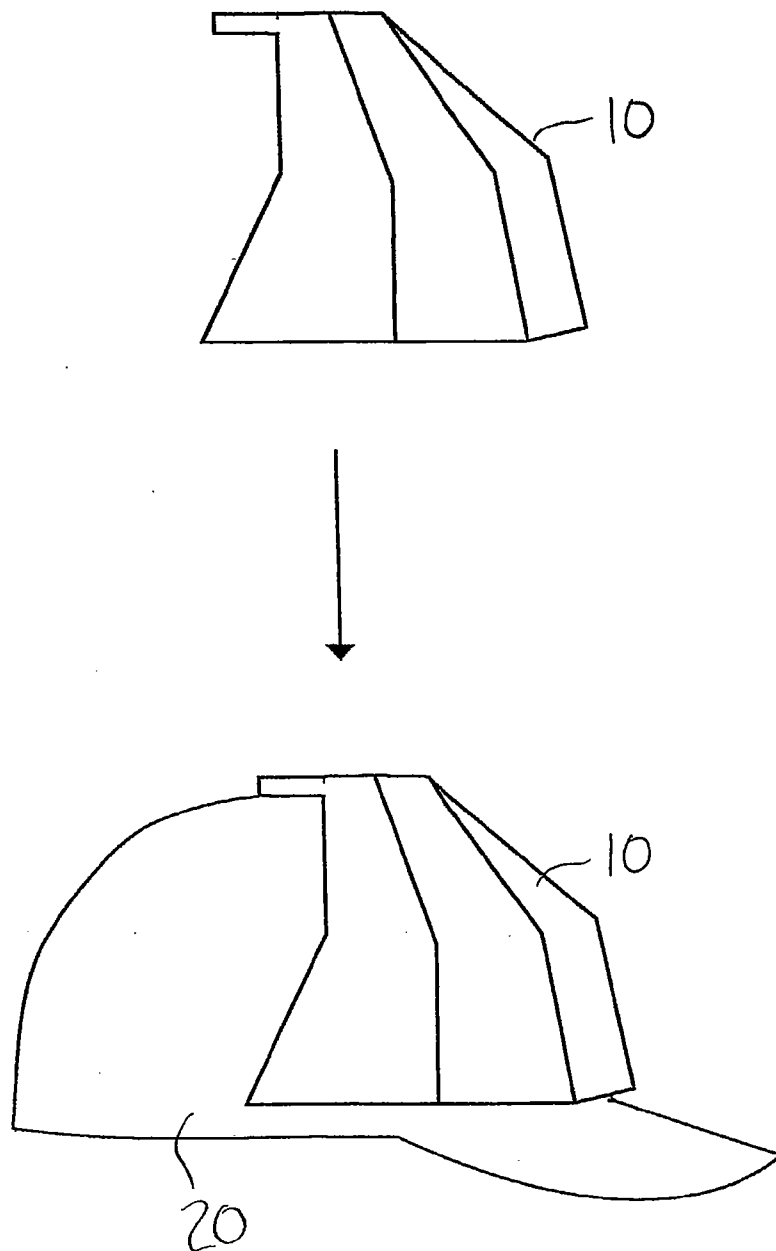


FIG. 15

(top view)

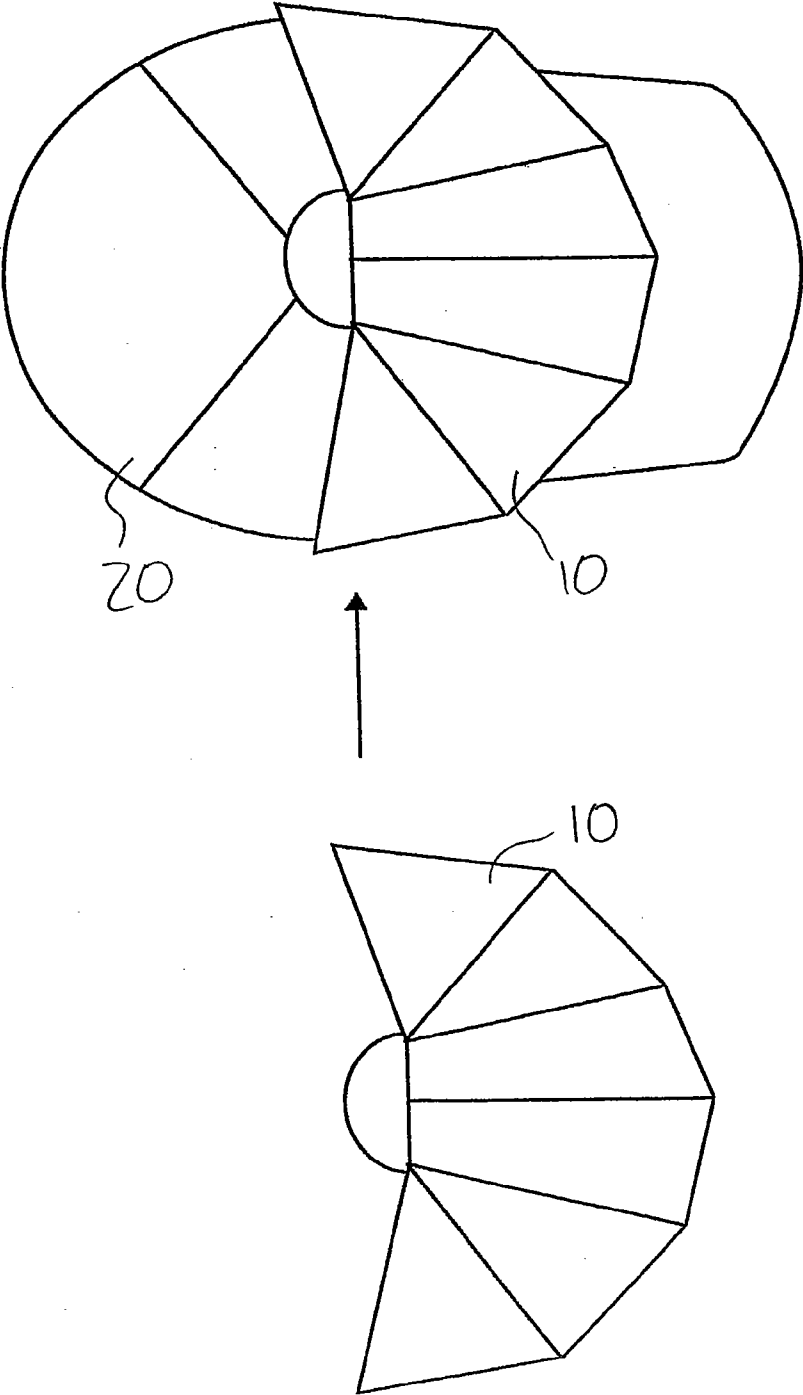


FIG. 16

BALL CAP SHIELD

CROSS-REFERENCES TO RELATED APPLICATIONS

[0001] This Continuation application claims priority from U.S. patent application Ser. No. 10/948,057, filed Sep. 23, 2004, which claims priority from U.S. Provisional Patent Application No. 60/506,447 filed Sep. 26, 2003, incorporated by reference in its entirety

FIELD OF THE INVENTION

[0002] The present invention relates generally to protective headgear devices, and more particularly to a shield for a ball cap to protect the wearer's head.

BACKGROUND OF THE INVENTION

[0003] Baseball and softball are activities that are enjoyed by millions of Americans every year. From little league to recreational softball, and collegiate to semiprofessional and professional leagues, baseball has earned the nickname of our national pastime. The game is played with a ball that is pitched to a batter who attempts to hit the ball and run around three bases before reaching the starting place, home plate. Fielders attempt to catch the ball before it hits the ground, or advance the ball to the base that a runner is approaching. Fielders patrolling the bases can get the runner "out" if they tag the runner in some cases, or tag the base prior to the runner reaching the base in other cases. The many rules of baseball are complicated and the details of the rules of play are beyond the scope of the present invention, but some rules discussed below are pertinent to the present discussion.

[0004] A baseball is formed of several layers, or wrappings encased in a two-piece leather cover. The heart of the ball is a composite cork/rubber center surrounded by two layers of rubber, one red, the other black. The first wrap around the core is a four-ply gray wool winding. The second wrap is a three-ply white wool winding. The third wrap is a three-ply gray wool winding. The fourth and final wrap is a fine cotton string forming a finish winding. The windings are done on machines and each ball is measured and weighed after each winding. Each half of the leather cover is alum tanned to give it the white color, and cut in a FIG. 8. The two halves are double stitched by hand using 10/5 red thread. Completed balls are tested for size, weight and coefficient of restitution.

[0005] A finished baseball weighs five ounces and has a coefficient of restitution of approximately 0.503 and a compression deflection at 500 psi of 0.363 inches. The many tight windings of a baseball's interior gives the ball a hardness that is necessary to generate the four hundred foot home runs that major league hitters are capable of. The velocity of a pitched baseball reaches speeds in the professional leagues of up to one hundred miles per hour, or one hundred forty feet per second. Balls struck by a bat can exceed this velocity twenty percent or more, resulting in a batted ball velocity of up to one hundred and twenty miles per hour, or approximately one hundred sixty five feet per second. At five ounces, a ball traveling one hundred sixty five feet per second has a potentially lethal momentum if it should strike a player in the head. The pitcher, who stands a mere sixty feet six inches from the batter, is at most risk. A ball traveling one hundred sixty five feet per second will reach the pitcher in just over one third of a second. Even professional athletes with highly advanced

motor functions have difficulty reacting flawlessly under these conditions, and an error can result in severe injury to the head and face.

[0006] Traditional baseball and softball uniforms include a cloth cap with a bill on the front and a logo on the forward-facing top portion. While batters wear protective helmets to protect them against pitched balls, there is no protective gear used to safeguard the pitcher from batted balls that can reach speeds greater than pitched balls. Moreover, the motion that a pitcher undergoes in delivering a ball at the velocities needed to be successful often leave the pitcher off balance or turned slightly away from the batter, further inhibiting the pitcher's ability to react quickly to a ball hit by the batter toward the pitcher's head. In addition, most pitchers during delivery of the pitched ball lean their head forward in a downward facing direction exposing the forehead and scalp to a direct impact from a batted ball. This has led to serious injury to pitchers who were unable to avoid a batted ball hit directly back toward the pitcher's head. The prior art lacks a simple, unobtrusive protective element that can be worn with a traditional ball cap and can protect a pitcher or other fielder from being struck in the head with a batted or thrown baseball or softball.

SUMMARY OF THE INVENTION

[0007] A protective ball cap shield is characterized by a curved protective overlay for a ball cap that secures to the frontal portion of the cap and provides protection from oncoming batted balls. In a first embodiment, the shield is made of plastic and conforms with the contour of the frontal portion of the ball cap above the bill, with rearwardly extending flaps that extend partially around the ball cap. The flaps include mountings for securing an adjustable strap that tightens around the rear portion of the cap and wearer's head to secure the shield in place. A liner of foam or other energy absorbing material can be included on the lower inner surface of the shield. In addition, the shield can be matched in color to the ball cap and include a logo similar to the logo on the cap to simulate the front of the cap and render the shield substantially undetectable from a distance. In a second embodiment, the shield can be disposed inside the cap at the forward portion behind the logo, hidden from view. A hook and loop securing system, such as VELCRO®, may be used to anchor the shield inside the cap in the proper position, and a liner of foam or other energy absorbing material can be included on the surface of the shield adjacent the wearer's head. In a third embodiment, the shield can be sewn into a forward location of the ball cap between two layers of material forming the ball cap. In yet another embodiment, an optional eye guard is included.

[0008] While the disclosure describes the invention with respect to baseball caps, the invention is not limited to this exemplary application and is equally applicable to caps used in other sports.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] FIG. 1 is a side view of a first embodiment of the ball cap shield of the present invention;

[0010] FIG. 2 is a front view of the ball cap shield of FIG. 1;

[0011] FIG. 3 is a rear view of the ball cap shield of FIG. 1;

[0012] FIG. 4 is a side view of a second embodiment of the ball cap shield of the present invention;

- [0013]** FIG. 5 is a bottom view of the ball cap shield of FIG. 4;
- [0014]** FIG. 6 is a side view of a third embodiment of the ball cap shield of the present invention;
- [0015]** FIG. 7 is a side view of a fourth embodiment of the ball cap shield of the present invention;
- [0016]** FIG. 8 is a side view of a fifth embodiment of the ball cap shield of the present invention;
- [0017]** FIG. 9 is a side view of the fifth embodiment of the ball cap shield of the present invention including a bill extension;
- [0018]** FIG. 10 is a side view of the fifth embodiment of the ball cap shield of the present invention including a bill extension shorter than that shown in FIG. 9;
- [0019]** FIG. 11 is a side view of a sixth embodiment of the ball cap shield of the present invention;
- [0020]** FIG. 12 is a bottom view of the sixth embodiment of FIG. 11;
- [0021]** FIG. 13 is a side view of an seventh embodiment of the ball cap shield of the present invention;
- [0022]** FIG. 14 is a side view of an eighth embodiment of the ball cap shield of the present invention;
- [0023]** FIG. 15 is a side view of a ninth embodiment of the ball cap shield of the present invention; and
- [0024]** FIG. 16 is a top view of the ninth embodiment of the ball cap shield of FIG. 15.

DETAILED DESCRIPTION OF THE INVENTION

[0025] FIGS. 1-3 illustrate a ball cap shield 10 formed of a continuous plastic panel shaped to conform with the contour of a baseball cap 20. The shield 10 has a rounded frontal portion 30 with rearwardly extending peripheral flaps 40 extending from each side. The front surface curves upwardly and rearwardly transitioning to an upper surface 50 that preferably extends up to a cap's button 60 on the cap's upper surface 70. The rear or trailing edge 80 of the shield 10 slopes downwardly and rearwardly along both lateral sides terminating at the bottom edge 90 of the shield 10 to form an angled juncture 100 defining the peripheral flaps 110. Each flap 110 may preferably include a vertically oriented slot 120 sized for receiving a strap 130 therethrough. A strap 130 fed through both vertically oriented slots 120 and adjustably securable via a clasp 140 or hook and loop fastener system secures the shield 10 about the wearer's head on the outside of the ball cap 20. A third slot (not shown) on the upper surface 50 of the shield 10 at a rear edge 150 permits a second strap 160 to connect orthogonally to the original strap 130 and provide additional support. A clasp, releasable clip, snap, buckle, or VELCRO® straps can be used to connect the straps together and secure the shield 10 in the proper position.

[0026] The straps 130, 160 may be elastic or non-elastic, and may also be secured to the shield 10 by alternative modes such as rivets, adhesives, or hooks. In an alternative embodiment, the flaps 40 of the shield 10 are resiliently biased inwardly toward the ball cap's interior such that they grip the wearer's head through the ball cap 20 without additional straps or securing means. The resiliency of the flaps provides for easy doffing and removal, where the wearer spreads the flaps apart before placing the shield 10 on the ball cap 20, and the flaps' 40 resilient shape compresses against the sides of the ball cap 20 and secures the shield 10 to the cap 20 and/or the user's head.

[0027] The shield 10 is preferably formed of a dense polymer with impact absorbing capability such as polypropylene,

polystyrene, or suitable thermoplastic that can be formed into curved configuration to conform with the ball cap's exterior surface and retains a shape memory to maintain the desired shape. The curved configuration can include some abrupt surface changes to provide a dynamic appearance, such as that shown in FIGS. 15 and 16. Other materials and composites may be substituted provided they possess the requisite shape memory and are of sufficient rigidity and impact resistance to provide protection from a baseball or softball traveling at high velocity. The shield 10 in some embodiments may include a logo 170 or insignia of the team that overlays the logo of the ball cap and is of a matching color with the ball cap 20 to provide a facade that resembles the front of the ball cap.

[0028] The interior or concave surface 180 of the shield 10 may be supplied with padding 190 to further absorb any impact and improve comfort. And, the interior surface 180 may be equipped with patches or strips of hook and loop fastener material 190 that cooperates with complimentary patches 200 or strips located on the exterior of the ball cap to releasably secure the shield 10 to the ball cap's exterior. Moreover, the hook and loop patches can replace the straps 130, 160 or resilient flaps 40 discussed above, or used in combination with the straps and/or flaps to provide a secure coupling of the shield 10 and cap 20.

[0029] The shield 10 may include, in an alternative embodiment, a forwardly projecting bill cover 210 (FIG. 8) that overlays the bill 220 of the ball cap 20 and further secures the shield 10 to the cap 20. The bill overlay 210 is preferably integrally formed with the shield 10 and colored to match the bill 220 of the cap 20. The bill cover 210 acts as a gusset that provides increased structural integrity to the shield. In addition, this option provides further protection for the wearer as the bill 220 customarily is worn just above the eyes and the projection 210 extends the shield's coverage to the eye socket area. This is particularly important where a pitcher's head rotates toward the ground during deliver, exposing the forehead and scalp to an oncoming batted ball. Moreover, the natural instinct of a player when a projectile is headed for the face region is to duck, lowering the face as the hands go up to protect the facial area. The bill projection's expands the area of protection as the player ducks down, protecting the eyes and nose area. To secure the bill projection 210 to the cap bill 220, hook and loop fastener material may be placed on the underside of the shield's bill projection and the upper surface of the cap's bill, where the complimentary materials serve to releasably fasten the two surfaces together. Hooks, clips, rivets, snaps, buttons, or other fasteners could also be used to releasably or permanently affix the shield bill projection 210 to the upper surface of the ball cap. Likewise, as discussed above the strap 130 fed through both vertically oriented slots 120 and adjustably securable via a clasp or hook and loop fastener system secures the shield 10 about the wearer's head on the outside of the ball cap 20.

[0030] A second embodiment of the present invention is depicted in FIGS. 4 and 5 illustrating a ball cap shield 10a that secures inside the ball cap 20. This embodiment employs essentially the same shape as the first embodiment, but secures underneath the ball cap 20 in the forward area adjacent the wearer's forehead. To secure the shield 10a inside the ball cap 20, the shield may incorporate the hook and fastener material 230 along external regions that cooperate with complimentary regions of hook and fastener material disposed on interior locations of the ball cap. Alternatively, the shield 10a can be secured with snaps (not shown) on the external surface

that cooperate with their complimentary components affixed to the underside of the ball cap **20**, or by inserting the shield **10a** into a pocket inside the ball cap **20** specifically sized to receive the shield. Here, the shield **10a** is completely hidden from view underneath the ball cap **20**, eliminating the need for coloring the shield or placing a logo **170** on the shield. In this embodiment, the shield **10a** may optionally be provided with a bill projection that extends substantially coextensive with the bill **220** of the ball cap **20** on the under side of the bill. As before, the bill projection may be affixed to the cap bill by various methods previously discussed, including hook and fastener material, snaps, clips, and the like, or can be inserted into a large pocket.

[0031] The shield of the present invention may also be incorporated directly into the ball cap by adding a second layer **240** of material to the ball cap **20**, and then sandwiching the shield **10a** between the ball cap original layer and the added second layer **240** of material. As shown in FIG. 6, the second layer of material **220** may be placed over the shield **10a** and a seam **250** sewn around the shield **10a** to create a pocket on the ball cap's exterior that holds the shield in place. In this embodiment the shield becomes a permanent component of the ball cap that is not removed or separated from the cap. This feature has the benefit that the shield cannot be lost, dislodged, fall off or loosen about the wearer's head, but rather is always maintained in the proper position and orientation without the need for other fastening means.

[0032] In yet another embodiment of the invention shown in FIG. 7, the peripheral flaps **40a** on the shield **10** can be enlarged to extend downward and rearward in order to protect and cover the wearer's ears. The ears are easily damaged by impact and the temple around the ear is very susceptible to brain injury in the event of impact or trauma. By extending the protection of the shield of the present invention to the ears and surrounding area, the benefits provided by the present invention are expanded. And, the use of padding in the area of the ears provides additional protection as well as comfort when the resiliency of the ear flaps is used in securing the shield.

[0033] FIG. 8 illustrates another embodiment of the present invention, wherein the shield **10** attaches to the cap's exterior using patches of VELCRO® **200** spaced about the cap's lower edge and corresponding patches of VELCRO® **190** at the lower edge of the shield **10**. In FIG. 9, a bill extension **210** is incorporated into the shield **10** to provide additional structural strength and protection. The bill extension **210** is preferably integrally formed with the shield **10** into a single unit and acts as a gusset to increase the shield's strength. As shown in FIG. 10, it may be preferable to shorten the length of the bill extension **210a** to facilitate the attachment of the shield, to reduce its weight, and to provide the gusset strength. It can be used without additional attachment means, or the shield can be secured with means discussed above, such as straps, VELCRO®, or the like.

[0034] In FIGS. 11 and 12, a shield **10b** is formed by individual plates **300** applied to the cap's interior and secured with VELCRO® strips **310**. The plates **300** that form the shield can be made of a polymer or other impact resistant material such as Kevlar, where the plates are shaped to conform with the cap's interior to protect the wearer. Strips of VELCRO® fastener material are sewn into the cap's interior and adhered to the plate's outer surface to facilitate the attachment of the plates. Alternatively, the plates can be sewn into the cap as discussed above with respect to FIG. 6.

[0035] In FIG. 13, another embodiment is disclosed wherein the protective shield **10** is reinforced by incorporating a plurality of gussets **330** or projections along an exterior surface. The projections provide impact-absorbing capability to disperse energy from contact with a moving object to further protect the wearer.

[0036] Still another alternative to the present invention is the incorporation of an eyeguard **400** to the shield **10** that extends downward from the shield to protect the wearer's eyes as shown in FIG. 14. The eyeguard **400** may be transparent for night games or darkened to provide sun protection in day games. Securing the eyeguard **400** to the shield **10** is preferably achieved in a manner that provides no wiggle or play between the shield and eyeguard that could distract the wearer. An example of a rigid method of securing the eyeguard **400** include snaps **410** disposed on an upwardly projecting flap **420** that cooperate with complimentary snap-receiving members on the ball cap to removably attach the eye shield **400** to the cap.

[0037] From the foregoing description of the exemplary embodiment of the present invention, one of ordinary skill in the art will readily discover alternative embodiments within the scope of the present invention. Accordingly, the invention is not limited to the embodiments discussed, but rather determined by the claims appended hereto.

I claim:

1. Headgear for a baseball or softball fielder, comprising: a front plate component including at least one channel that provides a fracture zone; at least two side plate components attached to or integral with the front plate component, wherein the side plate components each include at least one channel that provides a fracture zone; a rear strap connected to the two side plate components; and a temple guard depending downwardly from each of the two side plate components; and wherein the headgear comprises an open top when positioned on a wearer's head or cap.
2. The headgear of claim 1 wherein each of the channels includes angled corners.
3. Headgear for a baseball or softball fielder, comprising: a front plate component; at least two side plate components attached to or integral with the front plate component; and a temple guard depending downwardly from each of the two side plate components.
4. The headgear of claim 3 further comprising at least one channel in each of the front and side plate components, wherein each of the channels provides a fracture zone.
5. The headgear of claim 4 wherein each of the channels includes angled corners.
6. The headgear of claim 3 wherein the front and side plate components include a layer of foam or other energy absorbing material.
7. The headgear of claim 3 further comprising an energy absorbing pad on an interior side of each of the temple guards.
8. The headgear of claim 3 further comprising a rear strap connected to the two side plate components, wherein the headgear comprises an open top when positioned on a wearer's head or cap.
9. Headgear for a baseball or softball fielder, comprising: a front plate component comprising a dense polymer or other impact resistant material and including a layer of foam or other energy absorbing material;

at least two side plate components comprising a dense polymer or other impact resistant material and including a layer of foam or other energy absorbing material and attached to the front component via straps;
 a rear strap connected to the two side plate components;
 and
 a temple guard comprising a dense polymer or other impact resistant material and including a layer of foam or other energy absorbing material depending downwardly from each of the two side plate components

10. A protective ball cap shield shaped to conform to the contour of a ball cap comprising:

a curved front plate component formed of a dense polymer or other impact resistant material and including a layer of foam or other energy absorbing material on the side adjacent the user's head; and

at least two side plate components flexibly connected to or integral with the ends of the front plate component formed of a dense polymer or other impact resistant material and including a layer of foam or other energy absorbing material on the side adjacent the user's head wherein the shield comprises an open top when positioned on a wearer's head or cap.

11. The protective ball cap shield of claim **10** further comprising temple guards formed of a dense polymer or other impact absorbing material depending downwardly from the two side plate components and including a layer of foam or other energy absorbing material on the side adjacent the user's head.

12. The protective ball cap shield of claim **10** wherein the front and side plate components include energy dispersing grooves.

13. The protective ball cap shield of claim **10** wherein the polymer is plastic.

14. The protective ball cap shield of claim **10** wherein the polymer is a thermoplastic.

15. The protective ball cap shield of claim **10** wherein the polymer is polystyrene.

16. The protective ball cap shield of claim **10** wherein the polymer is polypropylene.

17. The protective ball cap shield of claim **10** wherein the impact resistant material is Kevlar.

18. A protective ball cap shield shaped to conform to the contour of a ball cap in order to fit the shield snugly over the user's head or cap comprising:

a front plate component formed of a dense polymer or other impact resistant material and including on the inner surface facing the user's head a layer of foam or other energy absorbing material; and

at least two side plate components flexibly connected to or integral with the ends of the front plate component, formed of a dense polymer or other impact resistant material and including on the inner surface of all the plates facing the user's head, a layer of foam or other energy absorbing material wherein the shield comprises an open top when positioned on a wearer's head or cap.

19. The protective ball cap shield of claim **18** further comprising temple guards formed of a dense polymer or other impact resistant material depending downwardly from the side plate components and including a layer of foam or other energy absorbing material on the side facing the user's head.

20. A multi-plate protective headgear shaped to conform to the contour of a ball cap in order to fit the headgear snugly over the user's head or cap comprising:

a curved front plate having a generally flat lower edge formed of a dense polymer or other impact resistant material that includes a layer of foam or other energy absorbing material on the side of the plate adjacent the user's head;

two series of one or more separate side plates connected in sequence with each side plate formed of a dense polymer or other impact resistant material and wherein each side plate includes a layer of foam or other energy absorbing material on the side of the plate adjacent the user's head with the first side plate in each series flexibly connected to the front plate; and

a strap that extends from the last side plate in one series to the last side plate in the other series to fit the headgear snugly over the user's head wherein the shield comprises an open top when positioned on a wearer's head or cap.

21. The multi-plate protective headgear of claim **20** wherein the front plate includes energy dispersing grooves.

22. The multi-plate protective headgear of claim **20** including on a lower edge of the side plates, integrally formed flaps formed of a dense polymer or other impact resistant material wherein each flap extends over a user's temple area.

23. The multi-plate protective headgear of claim **22** wherein the flaps include a layer of foam or other energy absorbing material on the side of the flaps adjacent the user's head.

24. Protective headgear shaped to conform to the contour of a ball cap in order to fit the headgear snugly over the user's head or cap comprising:

a plate having a generally flat lower edge, a rounded frontal portion, and rearwardly extending peripheral flaps wherein the plate is formed of a dense polymer or other impact resistant material that includes a layer of foam or other energy absorbing material on the side of the plate adjacent the user's head.

25. The protective headgear of claim **24** wherein the plate includes energy dispersing grooves.

26. The protective headgear of claim **24** including on a lower edge of the plate, integrally formed flaps formed of a dense polymer or other impact resistant material wherein each flap extends over a user's temple area.

27. The protective headgear of claim **26** wherein the flaps include a layer of foam or other energy absorbing material on the side of the flaps adjacent the user's head.

28. The protective headgear of claim **24** including a strap that extends from the one side of the plate to the other side of the plate to fit the headgear snugly over the user's head.

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