Title: PROTECTIVE FACE GUARD WITH TRANSPARENT SHIELD

Abstract: A protective face guard (18) for use in playing sports. The guard (18) includes a shield (22) having a transparent portion (52) extending over an unobstructed viewing area to enable the wearer to have a clear line of vision. The unobstructed viewing area is preferably greater in diameter than about 44 mm for baseball play and greater in diameter than about 60 mm for Softball play so as to enhance visibility over more conventional face guards. The transparent portion (52) of the shield (22) is constructed of a material that will withstand the impact of a ball, and is preferably made of clear or tinted polycarbonate material. The guard (18) is configured to be secured to a helmet (10) or other headgear in a manner to further support the shield (22) upon impact and minimize flex.
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).
PROTECTIVE FACE GUARD WITH TRANSPARENT SHIELD

Cross-Reference to Related Applications

This application is based on and claims priority to U.S. Non-Provisional Application No. 11/888,816, filed August 2, 2007, which is incorporated herein by reference.

Background of the Invention

1. Field of the Invention

The present invention relates to protective gear for sports, and is more particularly directed to a face guard having a transparent shield configured to extend over an unobstructed viewing area. The face guard is particularly adapted for use with a baseball or softball catcher's mask or batting helmet.

2. Description of Related Art

Protective helmets and face guards are commonly used by players in various sports, and are often required in league play and professional sports such as baseball, softball, and hockey. In baseball and softball for example, batters and catchers are required to wear protective headgear to protect their heads, with the catcher's headgear additionally required to have a face guard typically referred to as a catcher's mask. These face guards are required to protect the wearer against being hit in the face with a ball.

Conventional catcher's masks include a padded frame that surrounds the catcher's face, with a single-piece metal face cage attached to the front of the frame to cover and protect the catcher's face. The padded frame is attached to a helmet or straps which secures the frame to the catcher's head. More recently, it has been known to securely affix metal face cages directly to the helmet alone and/or combined with a high strength polymer lower mask to the helmet to serve as a face guard.

The National Operating Committee on Standards for Athletic Equipment (NOCSAE) has established various standard performance specifications that must be met by batter's and catcher's helmets including specifications for helmets with face guards. Under these specifications, the face guards are required to protect against any contact in the ocular area and limited specified contact on other portions of the face. See NOCSAE (ND)072-04m05a and (ND)024-03m05. In order to comply with these specifications, the largest opening in the face guard for baseball play is typically no greater than about 44 mm and the largest opening in the face guard for softball play is typically no greater than about 60 mm in order to protect against any portion of the ball passing through the opening.
While these various face guards provide protection to the wearer, portions of the face guard positioned in the line of sight of the wearer can create an obstruction to clear viewing. Thus, there remains a need in the art for a protective face guard that provides adequate protection to the wearer, but does not obstruct the view of the wearer.

**Brief Summary of The Invention**

The present invention is directed to a protective face guard for use in playing sports. The guard includes a shield having a transparent portion extending over an unobstructed viewing area to enable the wearer to have a clear line of vision. The unobstructed viewing area has a height or vertical length greater than about 44 mm for baseball play and greater than about 60 mm for Softball play so as to enhance visibility over more conventional face guards. The transparent portion of the shield is constructed of a material that will withstand the impact of a ball, and is preferably made of clear or tinted polycarbonate material. The guard is configured to be secured to a helmet or other headgear in a manner to further support the shield upon impact and minimize flex. Thus, the wearer has a better viewing area and remains protected.

In one embodiment, a two-piece face guard comprising an upper transparent shield and a lower cage is secured to a protective helmet. The helmet includes a rigid shell configured to fit over a portion of a wearer's head, with top, rear, and side portions to protect the top, rear, and sides of a wearer's head. The top and side portions of the rigid shell define an opening in the area of the wearer's eyes and upper face. This opening presents an unobstructed viewing area extending horizontally a distance beyond the outer edge of each eye and extending vertically a distance greater than 44 mm for baseball play, and greater than about 60 mm for softball, so as to provide a clear line of sight. In a most preferred embodiment, the unobstructed viewing area has a width or horizontal length (measured along a straight horizontal axis at the vertical mid-point of the viewing area) ranging from 125 to 250 mm, preferably 170 to 240 mm. The unobstructed viewing area has a height or vertical length (measured along a straight vertical axis at the center front of the viewing area) ranging from about 45 to 150 mm, preferably 55 to 125 mm, and most preferably 65 to 100 mm. The upper transparent shield of the face guard is configured to fit over and cover the unobstructed viewing area.

The lower cage is configured to fit over and cover a lower portion of the wearer's face and mouth below the unobstructed viewing area. The lower cage is not required to be transparent and may be formed of any material suitable for protecting the wearer while...
permitting proper ventilation in the area of the lower nose and/or mouth. In a preferred embodiment, the lower cage is formed of tubular metal or a hard polymeric mask having vent holes.

At least a portion of the outer periphery of the upper transparent shield is engaged with a support. Preferably, top, side, and/or bottom portions of the outer periphery are secured in overlapping contact with corresponding portions of the rigid shell and lower cage. Alternatively, top and/or side portions of the outer periphery of the transparent shield are secured to intermediate supports such as metal bars or brackets that are likewise secured to the rigid shell. Rubber pads or other cushioning may be provided between the shield and the support to further reduce stresses on the shield at impact. In this manner, the shell, lower cage or intermediate support provide support to the shield to minimize flex upon impact.

In an alternative embodiment, a one-piece face guard is specifically adapted for use on a catcher's helmet, wherein the entirety of the face guard is made of a transparent shield. The catcher's helmet comprises a rigid shell configured to fit over a portion of a wearer's head, with top, rear, and side portions to protect the top, rear, and sides of the wearer's head. The sides extend downward from the top and wrap around to meet in the lower center front of the helmet to cover the lower face, chin, and/or neck of the wearer. The top and side portions of the rigid shell define an enclosed opening that presents an unobstructed viewing area extending horizontally a distance beyond the outer edge of each eye and extending vertically a distance from above and below the eyes to provide a clear line of sight. In a most preferred embodiment, the opening has a width or horizontal length (measured along a straight horizontal axis at the vertical mid-point of the viewing area) ranging from 125 to 225 mm, preferably 170 to 215 mm. The opening has a height or vertical length (measured along a straight vertical axis at the center front of the viewing area) ranging from 45 to 250 mm, preferably 55 to 185 mm, and most preferably 80-155.

In this embodiment, the transparent shield is configured to fit over and cover the entirety of the opening. Top, side, and bottom portions of the outer periphery of the shield are secured in overlapping relationship with corresponding portions of the top and side portions of the shell that serve as a support for the shield. Alternatively, top, side, and/or bottom portions of the outer periphery are secured to intermediate supports that are secured to the shell for this purpose. Rubber pads or other cushioning may be provided between the shield and the support to further reduce stresses on the shield at impact. In this manner, the supports serve to support the shield to reduce flex upon impact.
Additional aspects of the invention, together with the advantages and novel features appurtenant thereto, will be set forth in part in the description that follows, and in part will become apparent to those skilled in the art upon examination of the following, or may be learned from the practice of the invention. The objects and advantages of the invention may be realized and attained by means of the instrumentalities and combinations particularly pointed out in the appended claims.

**Brief Description of the Drawings**

FIG. 1 is a perspective view of a catcher's helmet having a two-piece face shield in accordance with a first embodiment of the present invention.

FIG. 2 is an exploded view of the catcher's helmet of FIG. 1.

FIG. 3 is a perspective view of a batter's helmet having a two-piece face shield in accordance with a first embodiment of the present invention.

FIG. 4 is a perspective view of a catcher's helmet with a full transparent shield serving as a face guard in accordance with a second embodiment of the invention.

**Detailed Description of Exemplary Embodiments**

A protective sports helmet having a two part face shield according to a first exemplary embodiment of the present invention is depicted in FIGS. 1-3 and a full transparent shield face guard according to a second exemplary embodiment of the present invention is depicted in FIG. 4. While the invention will be described in detail herein below with reference to these embodiments, it should be understood that the invention is not limited to the specific constructions or configurations shown in the exemplary embodiments. Rather, one skilled in the art will appreciate that a variety of configurations may be implemented in accordance with the present invention.

Looking to FIGS. 1 and 2, a protective catcher's helmet having a two-piece face guard in accordance with an exemplary embodiment of the present invention is depicted generally by the designation 10. Helmet 10 includes a rigid shell 12 defining a cavity 14 configured to fit over a wearer's head, and further defining a face opening 16 in the area of the wearer's face. Face opening 16 is substantially covered by face shield 18 secured (directly or indirectly) to rigid shell 12. Face shield 18 comprises a lower cage 20 and an upper transparent shield 22. Lower cage 20 is secured to rigid shell 12 to cover a portion of the wearer's lower face and mouth. Upper transparent shield 22 attaches to rigid shell 12 to cover an unobstructed viewing area adjacent the wearer's eyes and upper to mid-face. The top and upper side peripheral edges of shield 22 are secured in overlapping contact against a portion of rigid shell.
12 adjacent opening 16. The bottom and lower side peripheral edges of shield 22 overlap and rest against corresponding portions of lower cage 20.

Rigid shell 12 comprises a front shell 28 configured to fit around the front head, face, and neck of the wearer and a rear shell 30 configured to protect the back of the head. Front shell 28 comprises a top portion 32 and side portions 34 extending downward from each side of top portion 32 and wrap around to join at a lower front center of the helmet to cover the wearer's chin and/or neck. Top and side portions 32, 34 are preferably formed as a unitary piece of material.

Rear shell 30 is attached to front shell 28 with elastic straps (not shown) as is known in the art. The straps allow rear shell 30 to be pulled slightly away from front shell 28 to allow easily fitting the rigid shell over the wearer's head. Once in place, the straps pull rear shell 30 snugly against the back of the wearer's head to keep the protective helmet securely in place. The straps may be secured via slots or other attachment means to the front and rear shells 28, 30 as is well known in the art. Ventilation openings 38 are formed through rigid shell 12 to allow air flow to cool the wearer's head and also reduce the overall weight of the protective helmet. The configuration and positioning of openings 38 may vary as is known in the art.

Rigid shell 12 may be constructed of any sturdy material capable of withstanding a strike from a baseball or bat. Preferably, rigid shell 12 is constructed of a rigid plastic material such as Acrylonitrile Butadiene Styrene (ABS) or Polycarbonate. Rigid shell 12 may be custom manufactured to accommodate head sizes from extra small (6-3/8) to extra large (7-1/2), or may be manufactured to an intermediate one-size-fits-all configuration with various sizes of removable pads or straps attached to the interior cavity side of rigid shell 12 to size the protective helmet to a particular wearer. Rigid shell 12 may include padding at locations along the interior cavity side to provide a snug, comfortable fit to the wearer's head as is well known in the art.

Looking still to FIG. 2, lower face cage 20 comprises an upper bar 40 having a central portion extending in an outward arc to generally conform to the shape of the lower front face and opposite ends extending vertically upward a distance along the side of the cage and secured to attachment plate 42. A lower u-shaped bar 44 has upper ends secured to attachment plate 42 and extends downward to generally conform with the shape of the chin. Intermediate bars 46a, 46b, 46c extend generally horizontally in an outward arc positioned at various distances between upper and lower bars 40, 44. Opposite ends of intermediate bars are secured
along respective sides of lower bar 42. As best seen in FIG. 2, upper bar 40 and intermediate 46a preferably are affixed in side-by-side relationship to provide added strength to the members. Vertical struts 48a, 48b, 48c, 48d positioned at various distances extending between the sides of lower bar 44 and are secured along the back of bars 40, 42, and 46.

Bars 40, 44, 46 and vertical struts 48 are preferably constructed from a rigid tubular metal such as steel, aluminum, or titanium and, most preferably, from solid tubular steel. The bars and vertical struts may be joined or affixed to each via welding, soldering, gluing, or any other manner of adhesion known in the art. In addition, the bars and struts may be coated with a plastic or rubber coating to protect the metal members from the elements, and to improve the appearance of the face guard.

In an alternative embodiment (not shown), the lower cage may be formed of a solid mask having vent holes to enable the user to breathe easily. This mask may be formed of any polymeric material having sufficient tensile strength, impact resistance, and other properties to achieve a face cage that complies with applicable performance requirements and is preferably formed of nylon or polycarbonate materials.

Other materials and configurations for lower cage 20 will be apparent to those skilled in the art, and are within the scope of the present invention so long as the face guard 18 complies with the applicable NOCSAE standard performance specifications.

As seen in FIG. 2, rigid shell 12 includes apertures 50 for securing lower cage 20 to the rigid shell. Any type of fastener such as clips, screws, or rivets may be utilized for this purpose as is known in the art. Alternatively, the lower cage 20 may be secured to rigid shell 12 using other means such as ultrasonic welding or gluing.

Upper shield 22 comprises an inner transparent sheet 52 configured to fit over and cover an unobstructed viewing area formed in face opening 16. An outer frame 56 extends around the periphery of sheet 52 and is thicker than sheet 52 to provide additional strength and rigidity to the sheet. The frame is configured to overlap portions of the rigid shell 12 and is secured thereto by rivets 58 presented along the upper top and sides of frame 56 configured to extend through corresponding apertures 50 in shell 12. It should be understood that other materials or fastening methods for securing upper shield 22 will be apparent to those skilled in the art, and are within the scope of the present invention. Upper shield 22 is also configured to overlap and rest upon lower cage 20 along the sides and lower front of the upper shield. The support provided by the underlying portions of rigid shell 12 and lower cage 20 provide support to the shield to minimize flex upon impact. Rubber pads (not shown) or other
cushioning means may be provided between upper shield 22 and rigid shell 12 and/or lower cage 20 respectively in order to further reduce stresses on the shield upon impact with a ball.

It is anticipated that upper shield 22 could alternatively be positioned such that the outer periphery of the shield engages the interior side of rigid shell 12 and/or lower cage 20. In this manner, the outer periphery of the shield would be positioned in overlapping relationship behind the support supplied by the shell and/or lower cage. It is also anticipated that portions of the outer periphery of upper shield 12 may instead be secured to an intermediate support such as metal bars, brackets or fasteners that are likewise secured to the rigid shell 12 and/or lower cage 20 to provide the necessary support to the shield and prevent excessive flex upon impact.

The unobstructed viewing area covered by transparent sheet 52 allows wearers to have an unobstructed view from the protective helmet along their entire horizontal viewing field, even in the peripheral vision areas at the sides of their head. The unobstructed viewing area covered by sheet 52 extends horizontally a distance beyond the outer edge of each eye and extends vertically a distance greater than about 44 mm for baseball play, and greater than about 60 mm for softball play, so as to provide a clear line of sight. In a most preferred embodiment, the unobstructed viewing area has a width or horizontal length (measured along a straight horizontal axis at the vertical mid-point of the viewing area) ranging from 125 to 250 mm, preferably 170 to 240 mm. The unobstructed viewing area has a height or vertical length (measured along a straight vertical axis at the center front of the viewing area) ranging from 45 to 150 mm, preferably 55 to 125 mm, and most preferably 65 to 100 mm.

Sheet 52 is formed of a relatively transparent material, such that the wearer can see through the sheet. Sheet 52 may be clear or tinted. Preferably, sheet 52 and frame 56 are integrally formed as a single piece of material wherein the frame has greater thickness. The shield is preferably made of a strong polymeric material that will not shatter or measurably deflect upon impact with a ball. The shield may be made of a clear or tinted polycarbonate material for this purpose. A polycarbonate material well-suited to this purpose is available from BASF as Makrolon™ PC No. 3103. Upper face shield 18 is preferably configured and made from materials so as to comply with the performance requirements set forth in the applicable NOCSAE specifications.

The upper transparent shield provides a strong protective guard, while also providing an unobstructed viewing area for the wearer. The lower face cage provides strong protection to the wearer, while still allowing ventilation and breathability. Thus, the protective
sports helmet having a two-piece face shield of the present invention provides improved comfort and viewability to the wearer without sacrificing safety.

Looking to FIG. 3, a batter's helmet having a two-part face guard in accordance with the first embodiment of the present invention is generally denoted as 110. This embodiment is the same as the first embodiment described above with reference to FIGS. 1 and 2, except that the rigid shell 112 is configured as a batter's helmet rather than a catcher's helmet. The face guard 118 is similarly configured differently to correspond with the shape of a batter's helmet. Thus, helmet 110 includes a rigid shell 112 configured to cover the top, sides and back of the head and defining a face opening in the area of the wearer's face. The face opening is substantially covered by face guard 118 secured (directly or indirectly) to rigid shell 112. Face guard 118 comprises a lower cage 120 and an upper transparent shield 122. Lower cage 120 is similar in construction to lower cage 20 described with respect to the first embodiment except the cage is not elongated and is secured to the interior of the rigid shell. Upper transparent shield 122 has a slightly different shape, but the materials and dimensions are the same as described with respect to the first embodiment.

Looking to FIG. 4, a catcher's helmet having a full transparent face guard in accordance with a second embodiment of the present invention is denoted as numeral 210. In this embodiment, the rigid shell 212 is the same as rigid shell 12 described with respect to the first embodiment shown in FIGS 1 and 2. Face guard 218 is different in that it comprises a single transparent shield that attaches to rigid shell to cover the entirety of the face opening 16 (See FIG. 2) defined by the rigid shell. The top, side and bottom peripheral edges of shield 218 are secured in overlapping contact against a portion of rigid shell 212 adjacent opening 16. The support provided by the underlying portions of rigid shell 212 provide support to the shield to minimize flex upon impact. As described above, the shield could alternatively be positioned such that all or portions of the peripheral edges of shield 218 extend along the interior of, and in overlapping relationship with, corresponding portions of rigid shell 212. In another alternative, portion of the peripheral edges may instead be secured to an intermediate support such as metal bars, brackets or fasteners which are secured to corresponding portions of rigid shell 212. Rubber pads (not shown) or other cushioning means may be provided between guard 218 and rigid shell 212 in order to further reduce stresses on the shield upon impact with a ball.

Guard 218 comprises an inner transparent sheet 252 configured to fit over and cover the face opening 16. An outer frame 256 extends around the periphery of sheet 252 and
is thicker than sheet 252 to provide additional strength and rigidity to the sheet. Sheet 252 is formed of a relatively transparent material, such that the wearer can see through the sheet. Sheet 252 may be clear or tinted. Preferably, sheet 252 and frame 256 are integrally formed as a single piece of material wherein the frame has greater thickness. The shield is preferably made of a strong polymeric material that will not shatter or measurably deflect upon impact with a ball. The shield may be made of a clear or tinted polycarbonate material for this purpose. A polycarbonate material well-suited to this purpose is available from BASF as Makrolon™ PC No. 232103.

Top, side, and bottom portions of frame 256 are configured to overlap corresponding portions of rigid shell 212. Shield 218 is secured to the rigid shell via rivets 258 extending along the top and upper sides of the shield into corresponding apertures 50 (See FIG. 2) in the shell 212. It should be understood that other materials or fastening methods for guard 218 will be apparent to those skilled in the art, and are within the scope of the present invention. Guard 218 is otherwise configured and made from materials so as to comply with the applicable NOCSAE specifications.

The opening covered by sheet 252 extends horizontally a distance beyond the outer edge of each eye and extends vertically a distance greater than 44 mm for baseball play, and greater than 60 mm for softball play, so as to provide a clear line of sight. In a most preferred embodiment, the opening has a width or horizontal length (measured along a straight horizontal axis at the vertical mid-point of the viewing area) ranging from 125 to 225 mm, preferably 170 to 215 mm. The opening has a height or vertical length (measured along a straight vertical axis at the center front of the viewing area) ranging from 45 to 250 mm, preferably 55 to 185 mm, and most preferably 80 to 155 mm.

From the foregoing it will be seen that this invention is one well adapted to attain all ends and objectives herein above set forth, together with the other advantages which are obvious and which are inherent to the invention.

Since many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matters herein set forth or shown in the accompanying drawings are to be interpreted as illustrative, and not in a limiting sense.

While specific embodiments have been shown and discussed, various modifications may of course be made, and the invention is not limited to the specific forms or arrangement of parts and steps described herein, except insofar as such limitations are included
in the following claims. Further, it will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.
What is claimed and desired to be secured by Letters Patent is as follows:

1. A sports helmet comprising:
   
   a rigid shell configured to cover a portion of the head of a wearer, wherein said shell defines a face opening;
   
   a face guard secured to said rigid shell configured to cover at least a portion of said face opening, said face guard comprising a shield having a substantially transparent region configured to fully cover an unobstructed viewing area within said face opening, the unobstructed viewing area having a vertical dimension generally greater than about 44 mm, wherein portions of an outer periphery of said shield are engaged with supports.

2. A sports helmet in accordance with claim 1, wherein said face guard additionally comprises a lower face cage secured to said rigid shell and configured to cover a lower portion of said face opening below the unobstructed viewing area.

3. A sports helmet in accordance with claim 1 or 2, wherein said supports are selected from the group consisting of: corresponding portions of the rigid shell, intermediate supports secured to and extending from the rigid shell, corresponding portions of the lower face cage, and combinations thereof.

4. A sports helmet in accordance with claim 1, wherein top, side, and bottom portions of an outer periphery of said shield are positioned in overlapping relationship with corresponding portions of said protective helmet adjacent said face opening.

5. A sports helmet in accordance with claim 2, wherein said bottom portion of an outer periphery of said shield is positioned in overlapping relationship with an upper portion of said lower face cage.

6. A sports helmet in accordance with claim 1, wherein said helmet additionally comprises cushioning provided between at least some of said top, side, and bottom portions of said outer periphery of said shield and said supports.

7. A sports helmet in accordance with claim 1, wherein said substantially transparent region is formed by a substantially transparent material that will withstand the impact of a ball.
8. A sports helmet in accordance with claim 1, wherein said substantially transparent region is formed by a polycarbonate material.

9. A sports helmet in accordance with claim 7, wherein said substantially transparent region is formed by a material that is clear.

10. A sports helmet in accordance with claim 7, wherein said substantially transparent region is formed by a material that tinted.

11. A sports helmet in accordance with claim 7, wherein said substantially transparent region is formed by a polycarbonate material.

12. A sports helmet in accordance with claim 1 or 2, wherein said sports helmet comprises a catcher's helmet.

13. A sports helmet in accordance with claim 2, wherein said sports helmet comprises a batter's helmet.

14. A sports helmet in accordance with claim 1, wherein said unobstructed viewing area has a vertical dimension greater than about 60 mm.

15. A sports helmet in accordance with claim 1, wherein said unobstructed viewing area extends horizontally a distance beyond the outer edge of each eye of the wearer and extends vertically a distance at least as great as 44 mm.

16. A sports helmet in accordance with claim 1, wherein said unobstructed viewing area extends horizontally a distance beyond the outer edge of each eye of the wearer and extends vertically a distance at least as great as 60 mm.

17. A sports helmet in accordance with claim 1 or 2, wherein said unobstructed viewing area has a width or horizontal length ranging from about 125 to 250 mm and a height or vertical length ranging from about 45 to 150 mm.

18. A sports helmet in accordance with claim 1 or 2, wherein said unobstructed viewing area has a width or horizontal length ranging from about 170 to 240 mm and a height or vertical length ranging from about 55 to 125 mm.
19. A sports helmet in accordance with claim 1, wherein said unobstructed viewing area has a width or horizontal length ranging from about 125 to 225 mm and a height or vertical length ranging from about 45 to 250 mm.

20. A sports helmet in accordance with claim 1, wherein said unobstructed viewing area has a width or horizontal length ranging from about 170 to 215 mm and a height or vertical length ranging from about 55 to 185 mm.

21. A sports helmet in accordance with claim 2, wherein said lower cage is formed of tubular metal.

22. A sports helmet in accordance with claim 2, wherein said lower cage is formed of a hard polymeric mask having vent holes.

23. A catcher's helmet, said catcher's helmet comprising
   a rigid shell configured to cover a portion of the head of a wearer, wherein said shell defines a face opening; and
   a face guard secured to said rigid shell configured to cover at least a portion of said face opening, said face guard having a substantially transparent region formed of a material that will withstand the impact of a ball and having a width or horizontal length ranging from about 125 to 225 mm and a height or vertical length ranging from about 55 to 185 mm, wherein top, side and bottom portions of an outer periphery of said shield are engaged with corresponding portions of the rigid shell.

24. A catcher's helmet in accordance with claim 23, wherein said helmet additionally comprises cushioning provided between at least some of said top, side, and bottom portions of said outer periphery of said shield and said rigid shell.

25. A catcher's helmet in accordance with claim 23, wherein said substantially transparent region is formed by a polycarbonate material.

26. A catcher's helmet in accordance with claim 23, wherein said substantially transparent region has a width or horizontal length ranging from about 170 to 215 mm and a height or vertical length ranging from about 80 to 155 mm.
27. A sports helmet, said helmet comprising
   a rigid shell configured to cover the head of a wearer, wherein said shell defines a face opening;
   a substantially transparent shield configured to cover an unobstructed viewing area within said face opening, the unobstructed viewing area having a vertical dimension generally greater than about 44 mm;
   a lower face cage secured to said rigid shell and configured to cover a lower portion of said face opening below the unobstructed viewing area.

28. A sports helmet in accordance with claim 27, wherein said substantially transparent region is formed by a substantially transparent material that will withstand the impact of a ball.

29. A sports helmet in accordance with claim 27, wherein said substantially transparent region is formed by a polycarbonate material.

30. A sports helmet in accordance with claim 27, wherein said sports helmet comprises a catcher's helmet.

31. A sports helmet in accordance with claim 27, wherein said sports helmet comprises a batter's helmet.

32. A sports helmet in accordance with claim 27, wherein said unobstructed viewing area has a vertical dimension generally greater than about 60 mm.

33. A sports helmet in accordance with claim 27, wherein said unobstructed viewing area has a width or horizontal length ranging from about 125 to 250 mm and a height or vertical length ranging from about 45 to 150 mm.

34. A sports helmet in accordance with claim 27, wherein said unobstructed viewing area has a width or horizontal length ranging from about 170 to 240 mm and a height or vertical length ranging from about 55 to 125 mm.

35. A sports helmet in accordance with claim 27, wherein said lower cage is formed of tubular metal.

36. A sports helmet in accordance with claim 27, wherein said lower cage is formed of a hard polymeric mask having vent holes.
FIG. 4
**A CLASSIFICATION OF SUBJECT MATTER**

IPC(8) - A42B 3/00, 3/22 (2008 04)

USPC - 2/425

According to International Patent Classification (IPC) or to both national classification and IPC

**B FIELDS SEARCHED**

Minimum documentation searched (classification system followed by classification symbols)

IPC(8) - A42B 3/00, 304, 3/18, 3/20, 3/22 (2008 04)

USPC - 299, 10, 15, 414, 424, 425, 229/1 10, 111

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

**C DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
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<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
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<td>X</td>
<td>US 6,301,719 B1 (GOODHAND et al) 16 October 2001 (16 10 2001) entire document</td>
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* Special categories of used documents

"A" document defining the general state of the art which is not considered to be of particular relevance

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Date of the actual completion of the international search: 15 October 2008

Date of mailing of the international search report: 28 Nov 2008

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents

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PCT OSP: 571 272-7774

Form PCT/ISA/210 (second sheet) (April 2005)