US 20140223646A1

(19) United States

(12) Patent Application Publication

(10) Pub. No.: US 2014/0223646 A1

(43) Pub. Date: Aug. 14, 2014

BOLOGNA et al.

(54) **FOOTBALL HELMET WITH RECESSED FACE GUARD MOUNTING AREAS**

(71) Applicant: **Riddell, Inc.**, Rosemont, IL (US)

(72) Inventors: **Vittorio BOLOGNA**, Elk Grove Village, IL (US); **Nelson KRAEMER**, Mount Prospect, IL (US); **Thad M. Ide**, Chicago, IL (US)

(73) Assignee: **Riddell, Inc.**, Rosemont, IL (US)

(21) Appl. No.: **14/179,360**

(22) Filed: **Feb. 12, 2014**

Related U.S. Application Data

(60) Provisional application No. 61/763,802, filed on Feb. 12, 2013.

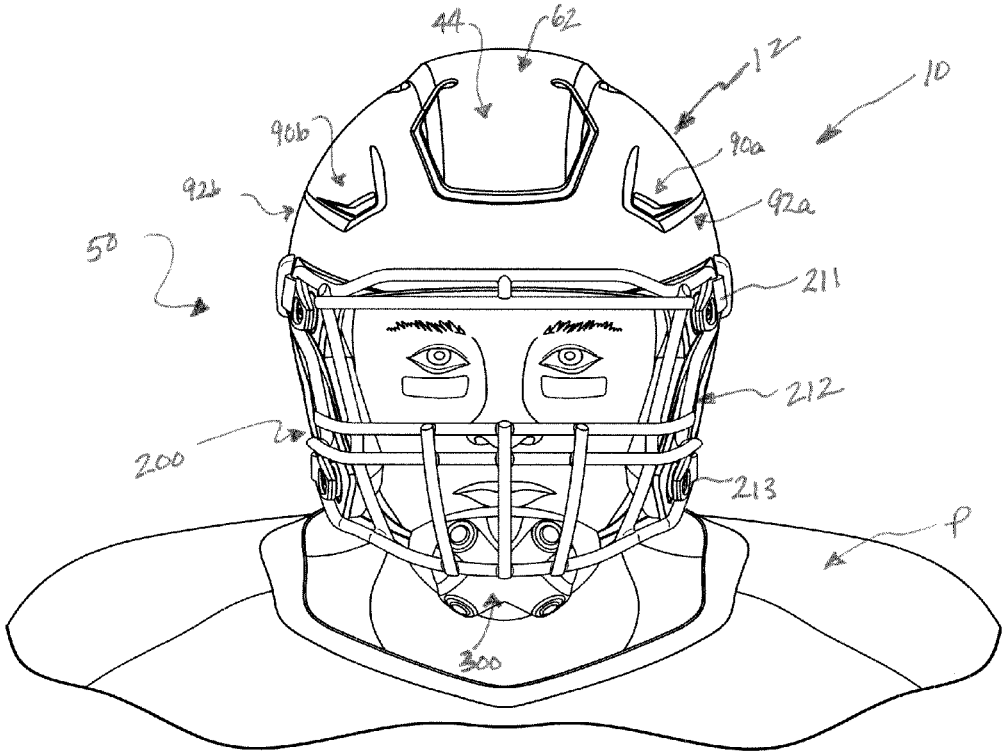
Publication Classification

(51) **Int. Cl.**
A42B 3/20 (2006.01)

(52) **U.S. Cl.**
CPC *A42B 3/20* (2013.01)
USPC **2/424**

(57) **ABSTRACT**

A protective football helmet is provided having a face guard mounting system with at least one pair of opposed recessed mounting regions that ensure a low-profile mounting arrangement for a face guard to the helmet. The recessed mounting regions are formed in both the inner and outer surfaces of the helmet shell along a frontal opening in the shell. As a result of the streamlined frontal appearance provided by the face guard mounting system, the width of the face guard closely corresponds to the width of the helmet at the recessed mounting regions.



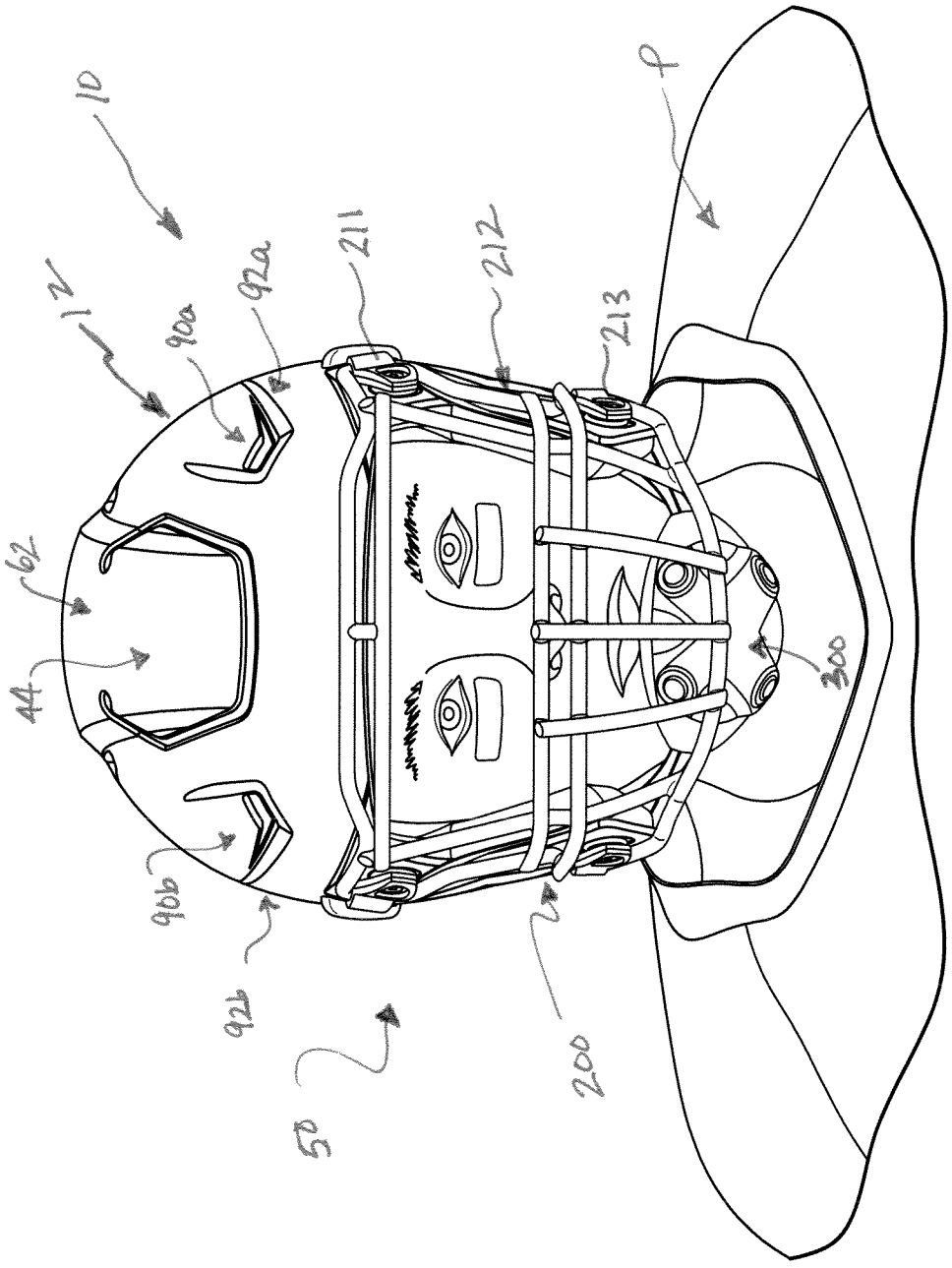


FIG. 1

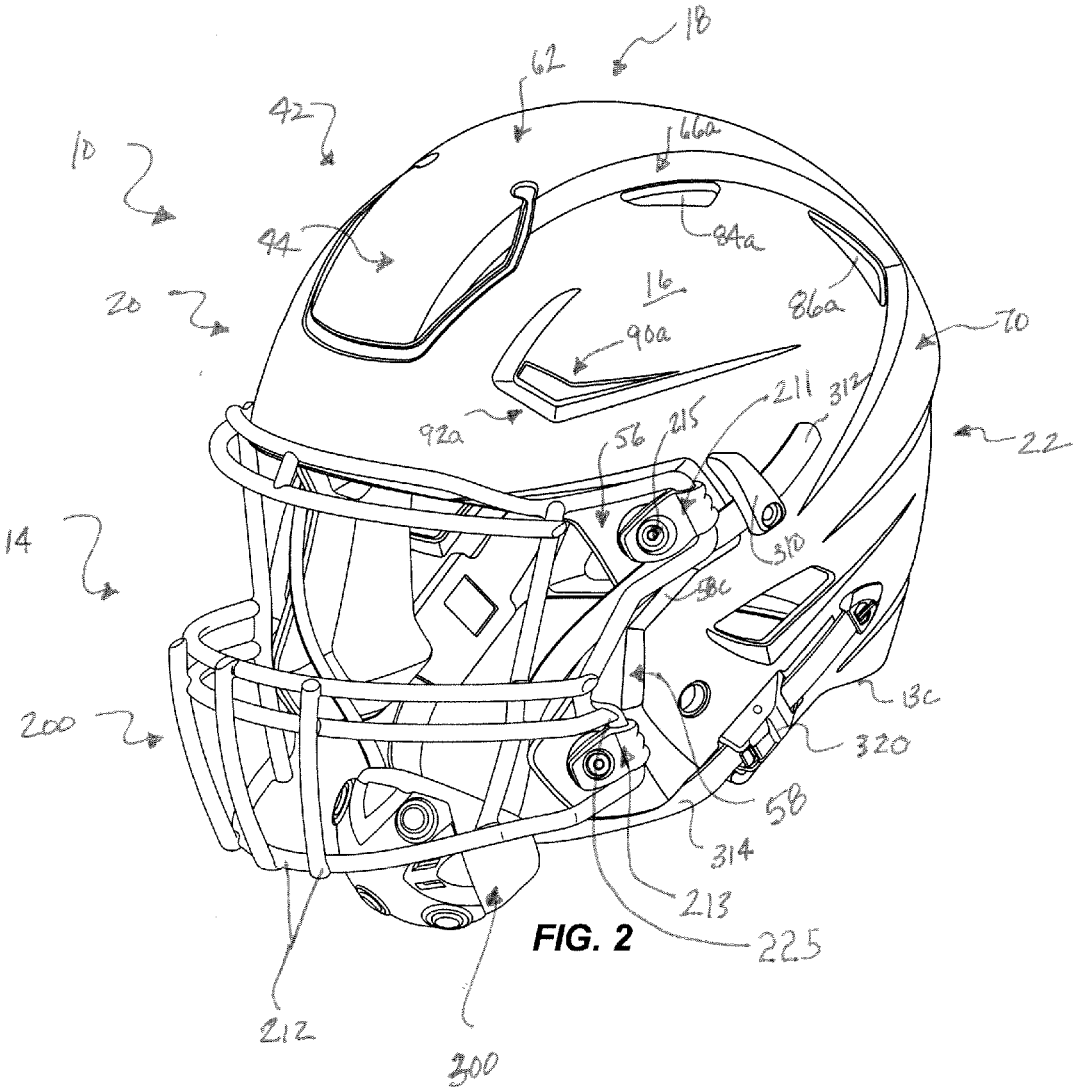

18
62
42
10
66a
44
84a
16
20
86a
70
90a
92a
56
215
211
312
22
14
310
58c
13c
200
320
58
314
213
225
212
300

FIG. 2

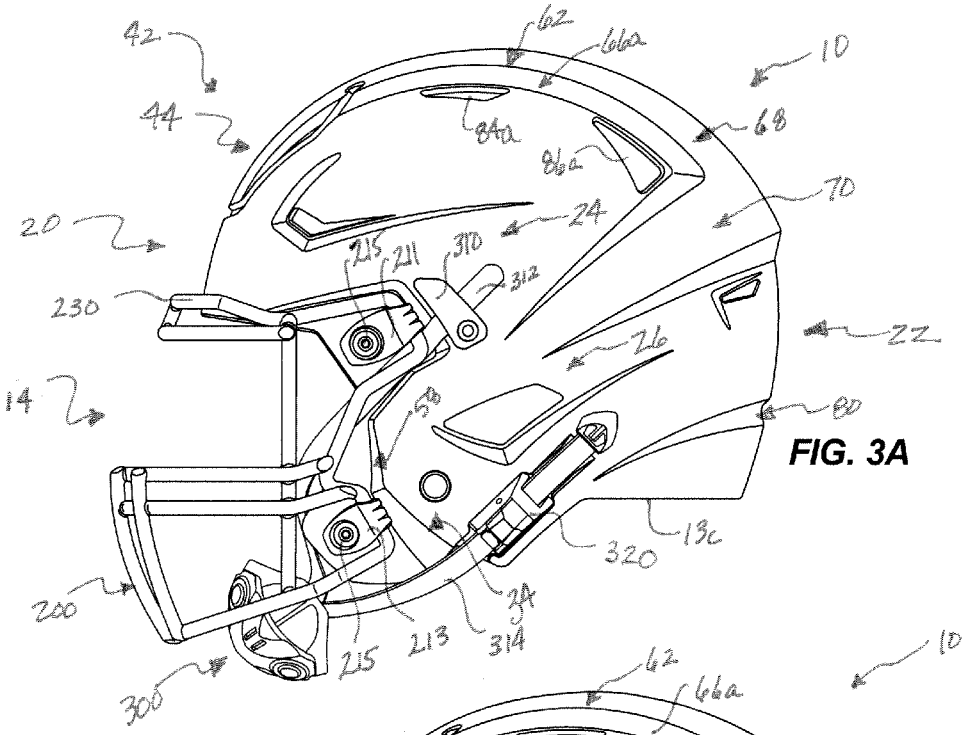

42
62
66a
10
44
84a
68
86a
70
20
24
215
211
310
312
230
22
26
14
58
60
320
13c
200
24
215
213
314
300

FIG. 3A

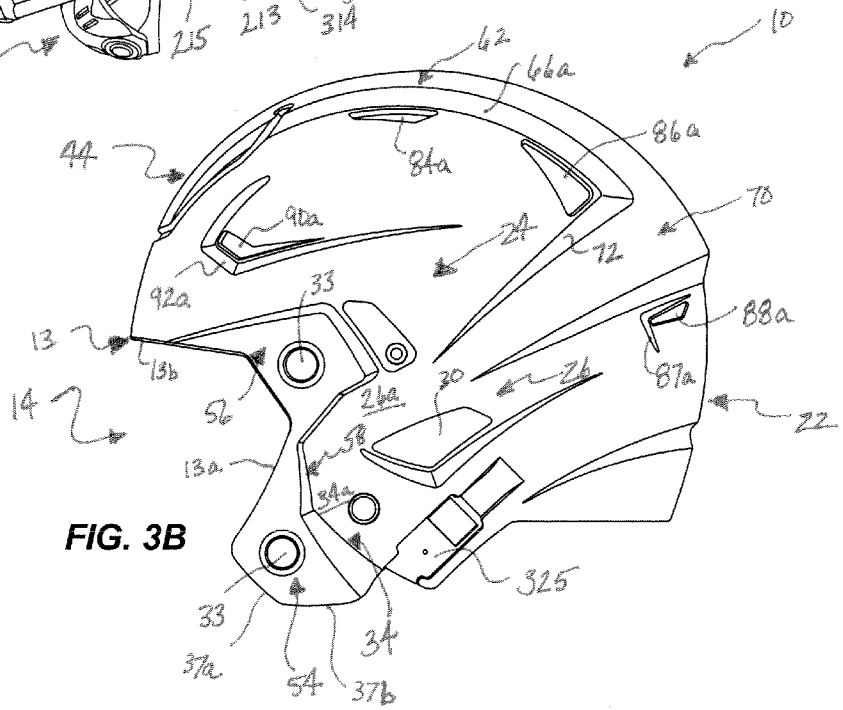

10
62
66a
44
84a
86a
70
92a
24
72
92a
33
88a
13
13b
87a
14
56
26a
30
26
22
58
13a
54a
325
33
34
37a
54
37b

FIG. 3B

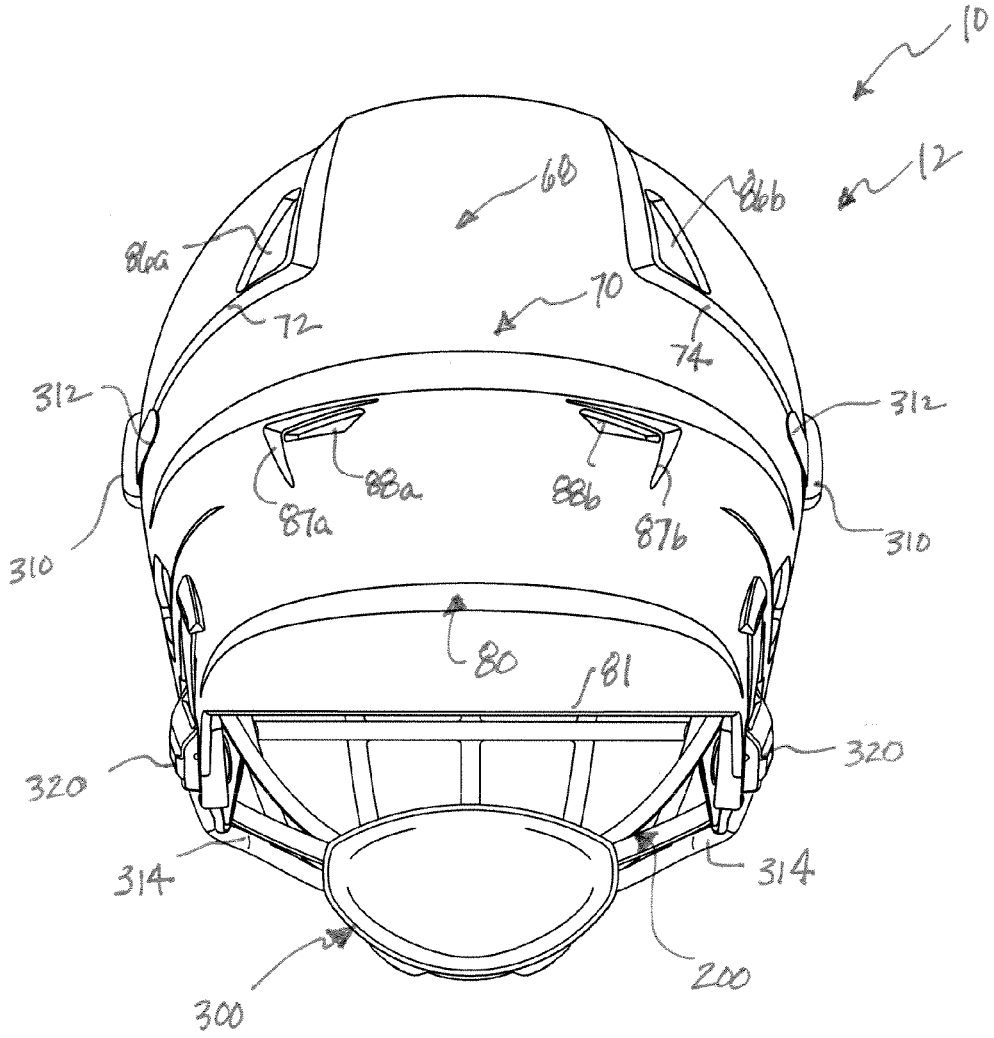

10
12
60
86a
86b
70
72
74
312
312
88a
88b
87a
87b
310
310
80
81
320
320
314
314
300
200

FIG. 4

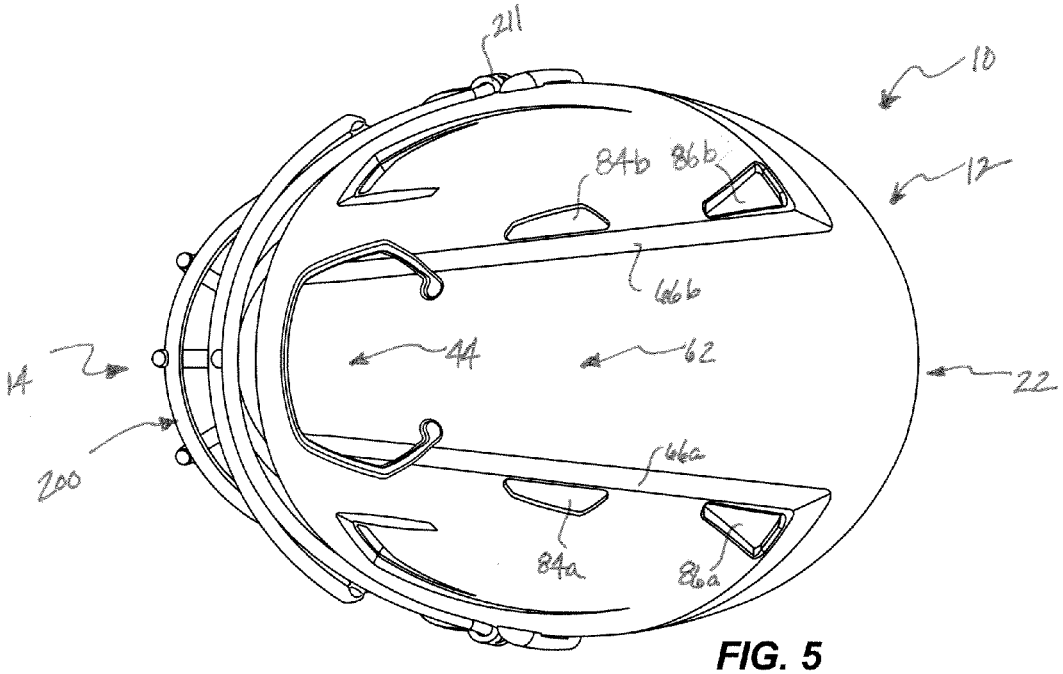

211
10
12
84b
86b
66b
14
44
62
22
200
66a
84a
86a

FIG. 5

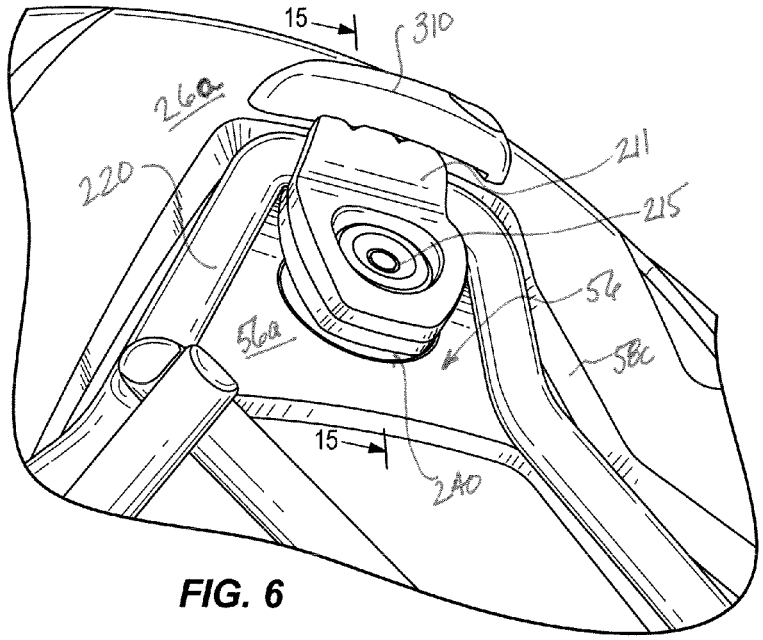

15
310
26a
220
211
215
54
56a
58c
15
240

FIG. 6

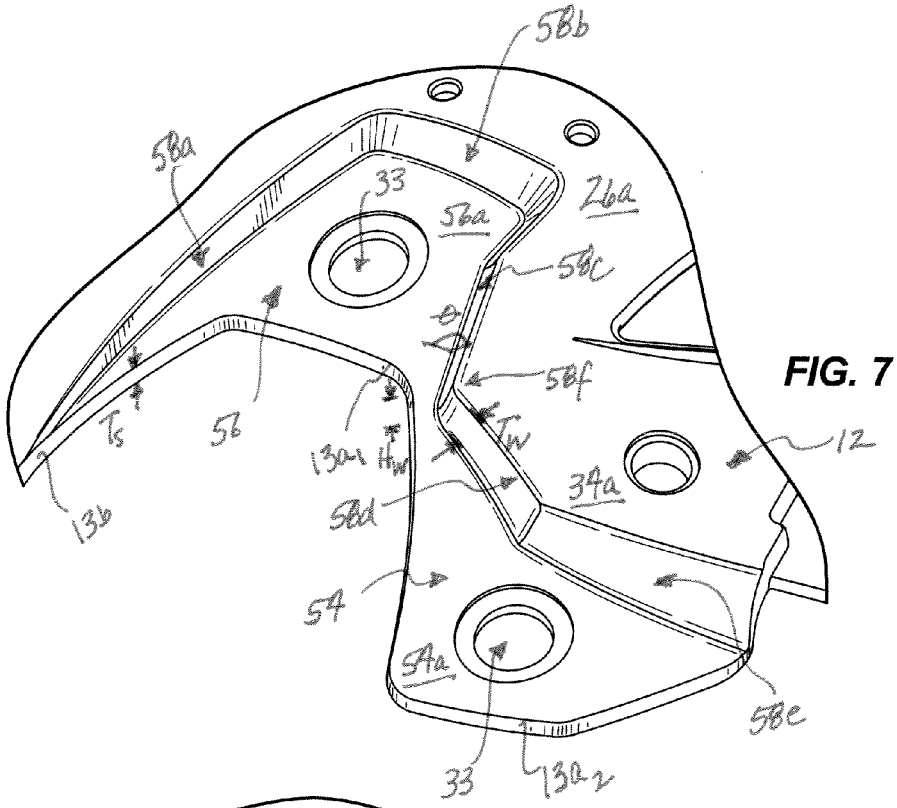

58b
58a
33
26a
56a
58c
58f
12
56
34a
58d
54
54a
58e
33
13a2

FIG. 7

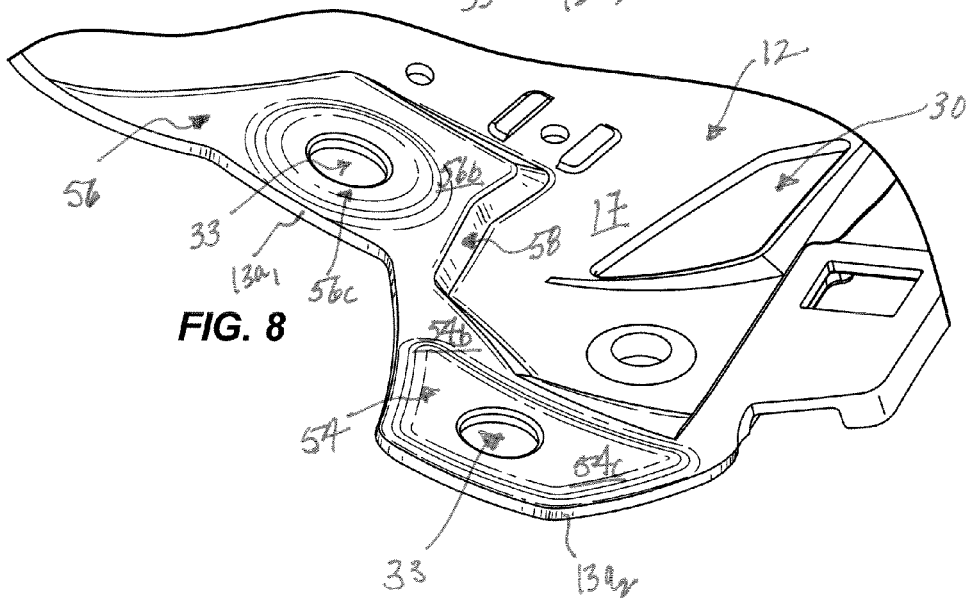

12
30
56
56b
33
58
17
13a1
56c
54b
57
54c
33
13a2

FIG. 8

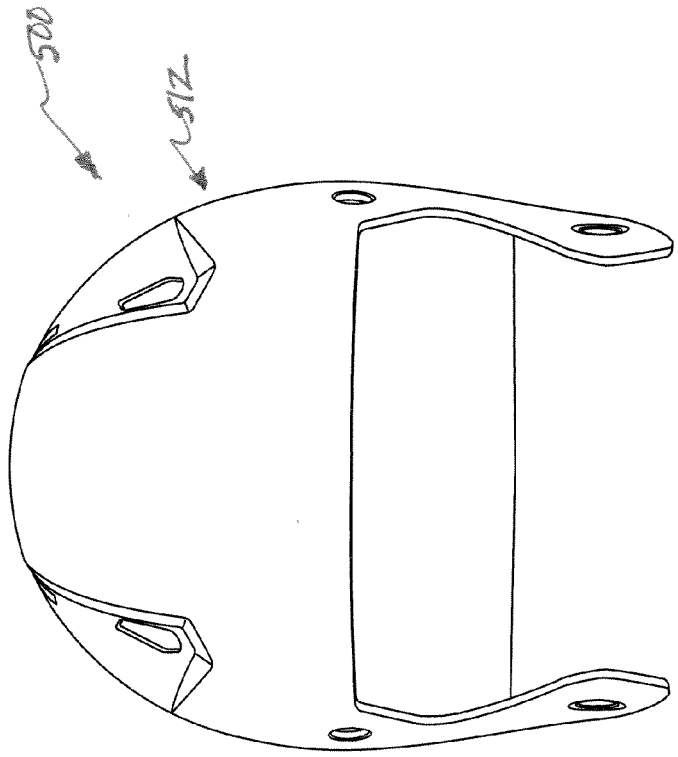


FIG. 10

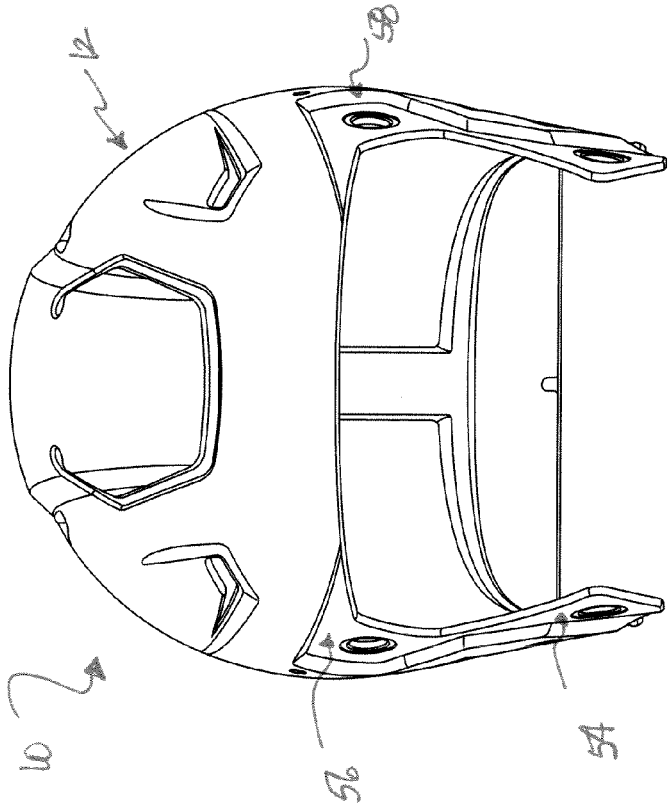


FIG. 9

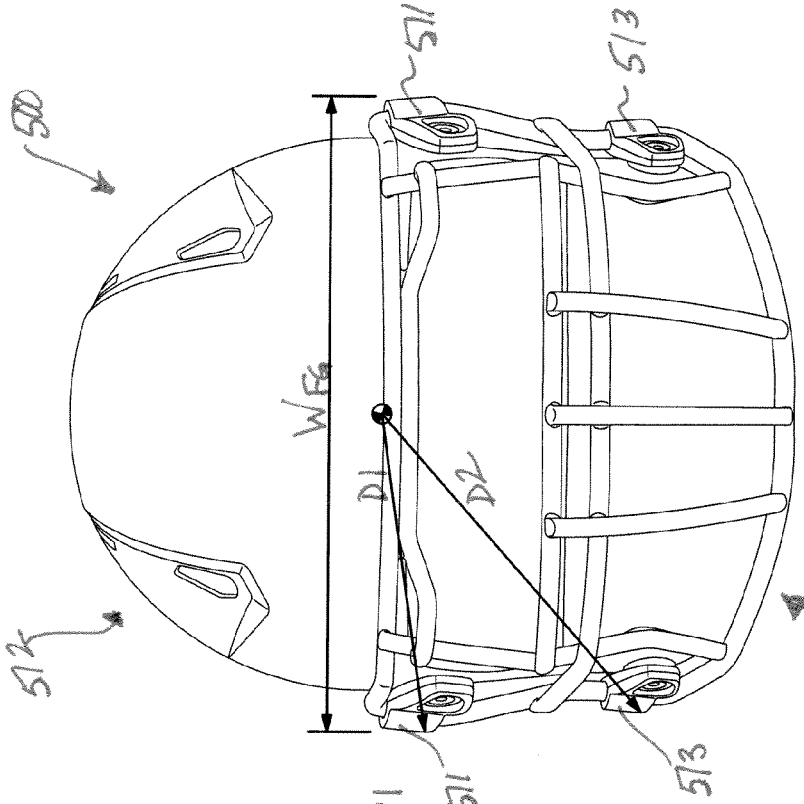


FIG. 12A

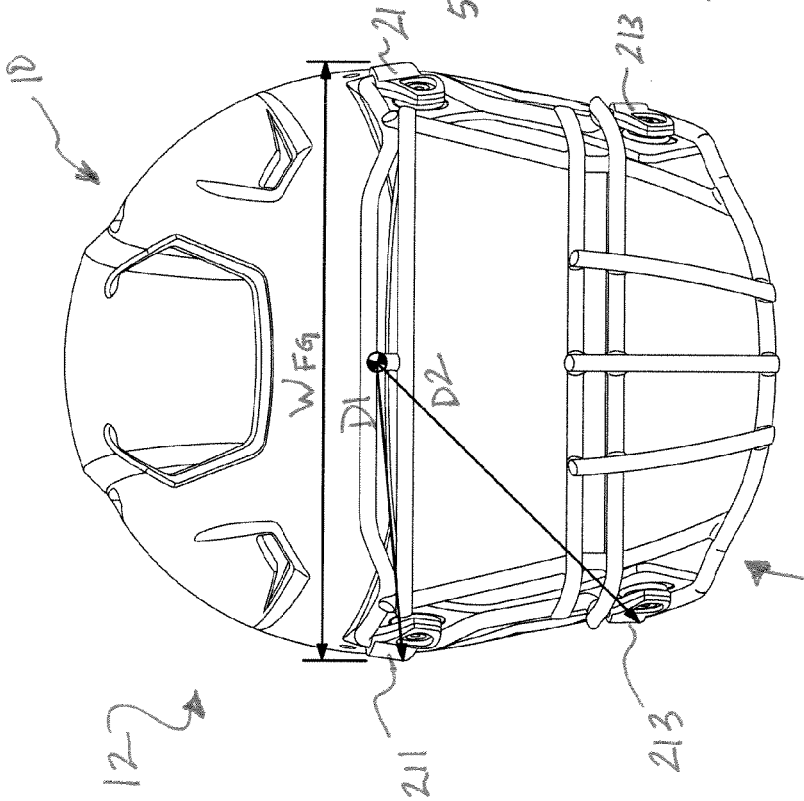


FIG. 11A

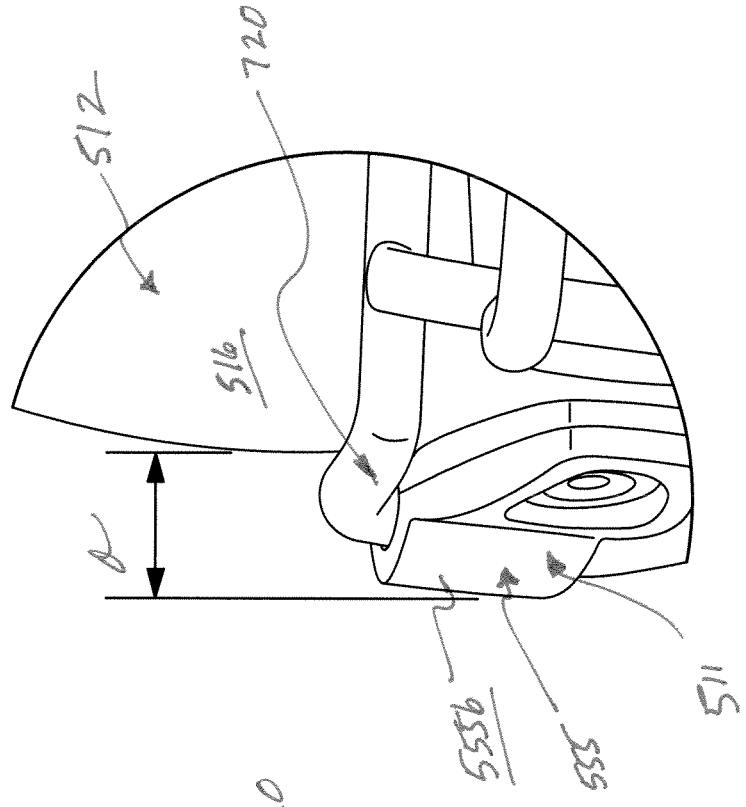


FIG. 12B

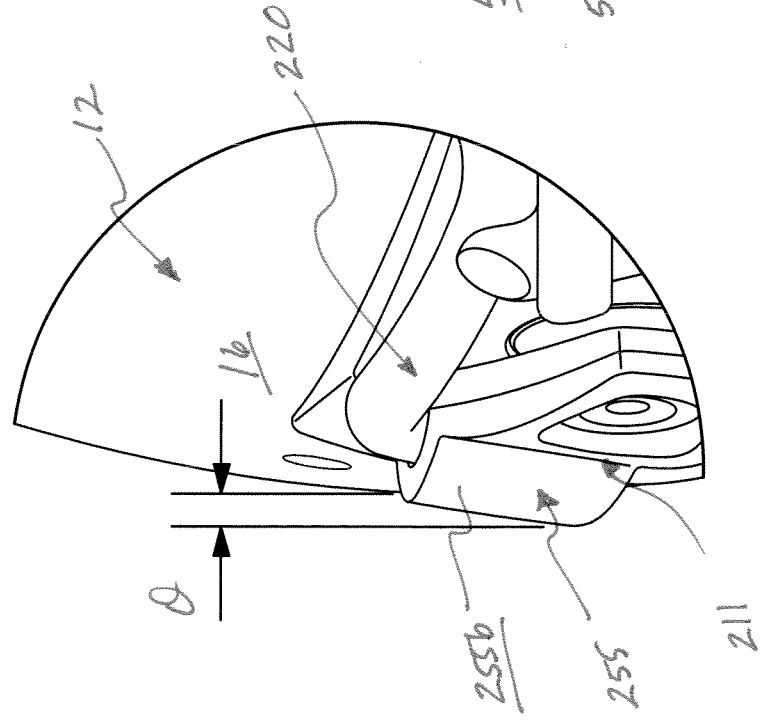


FIG. 11B

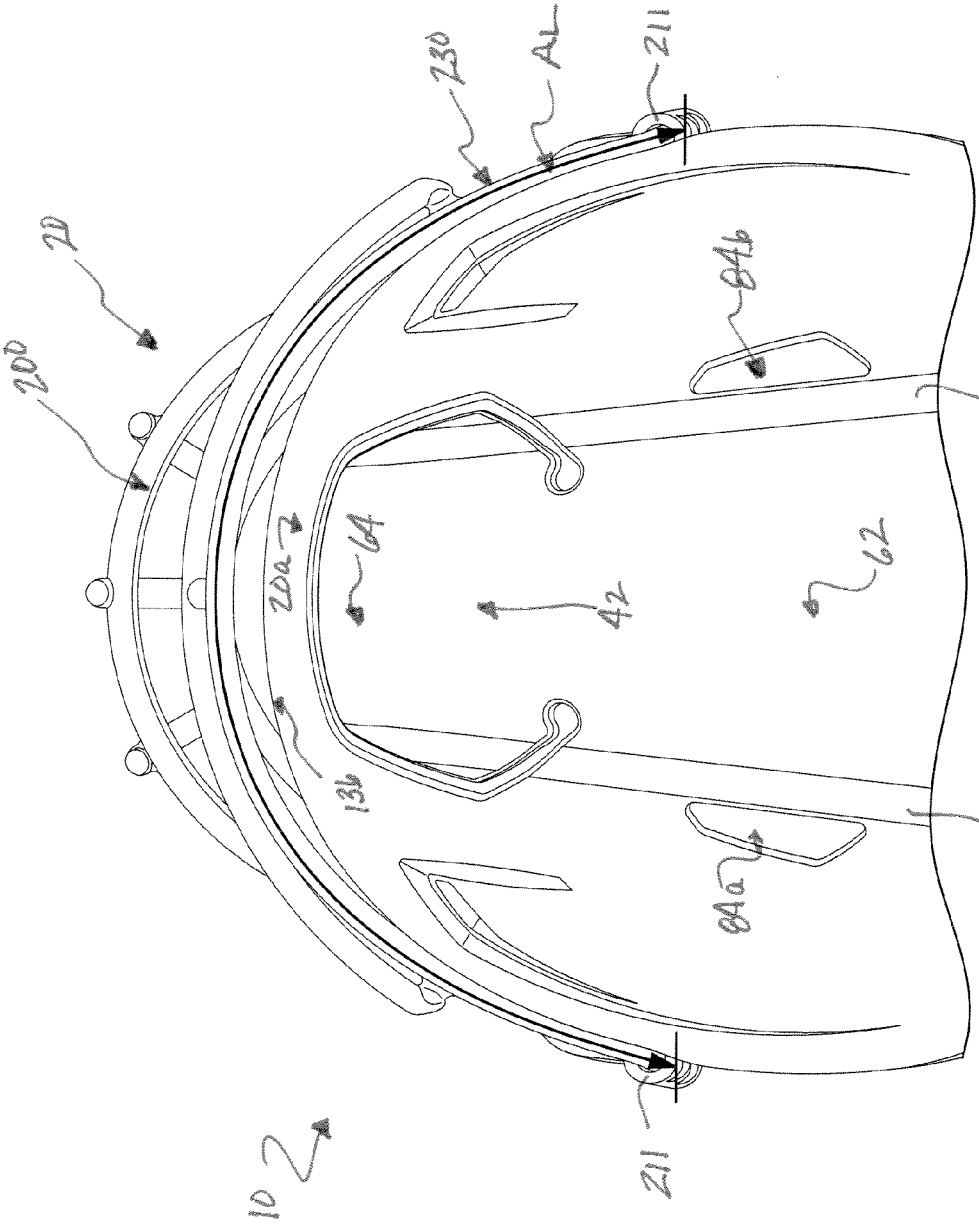


FIG. 13

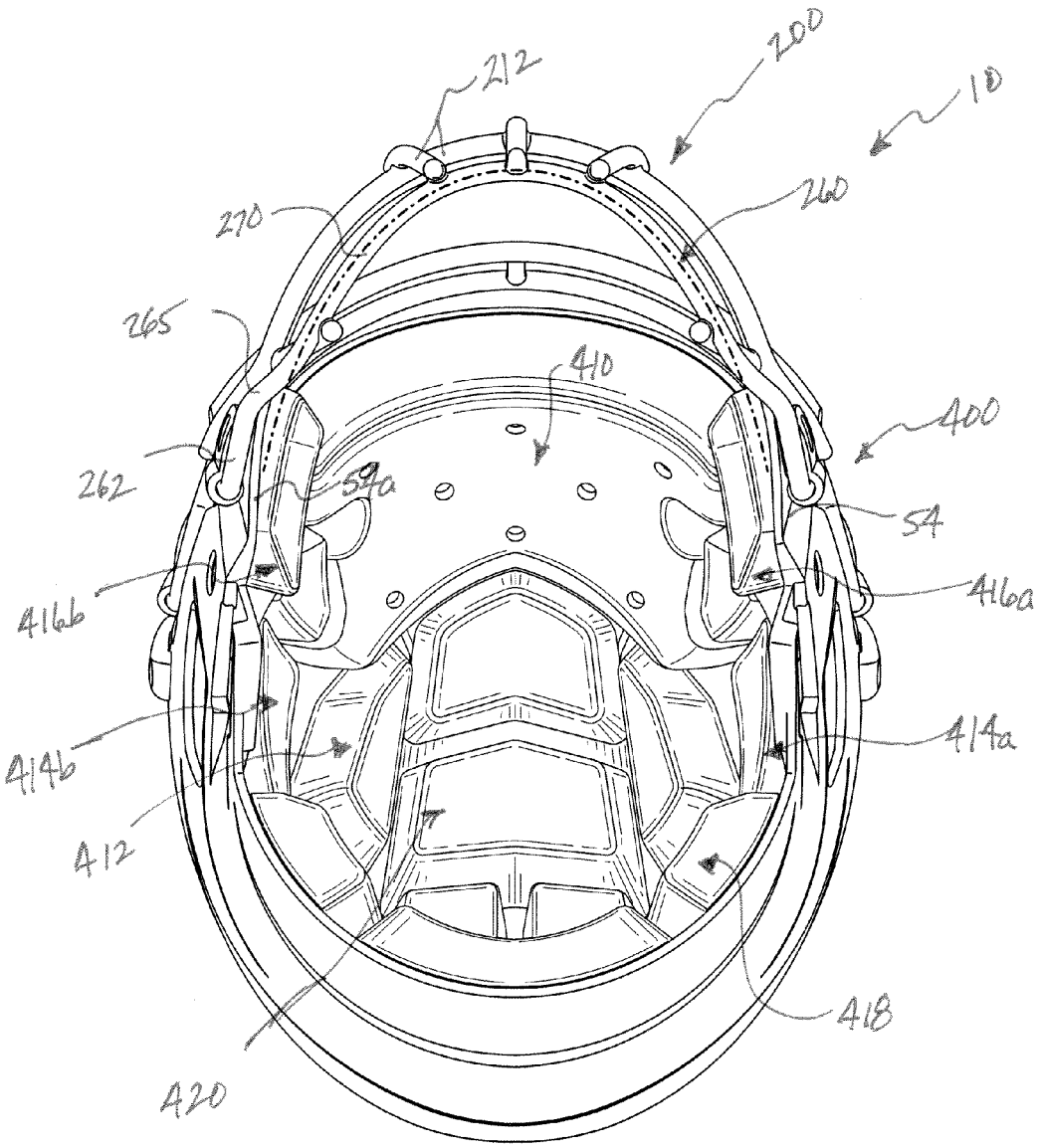

212
200
10
270
260
265
410
400
262
54a
54
416b
416a
414b
414a
412
418
420

FIG. 14

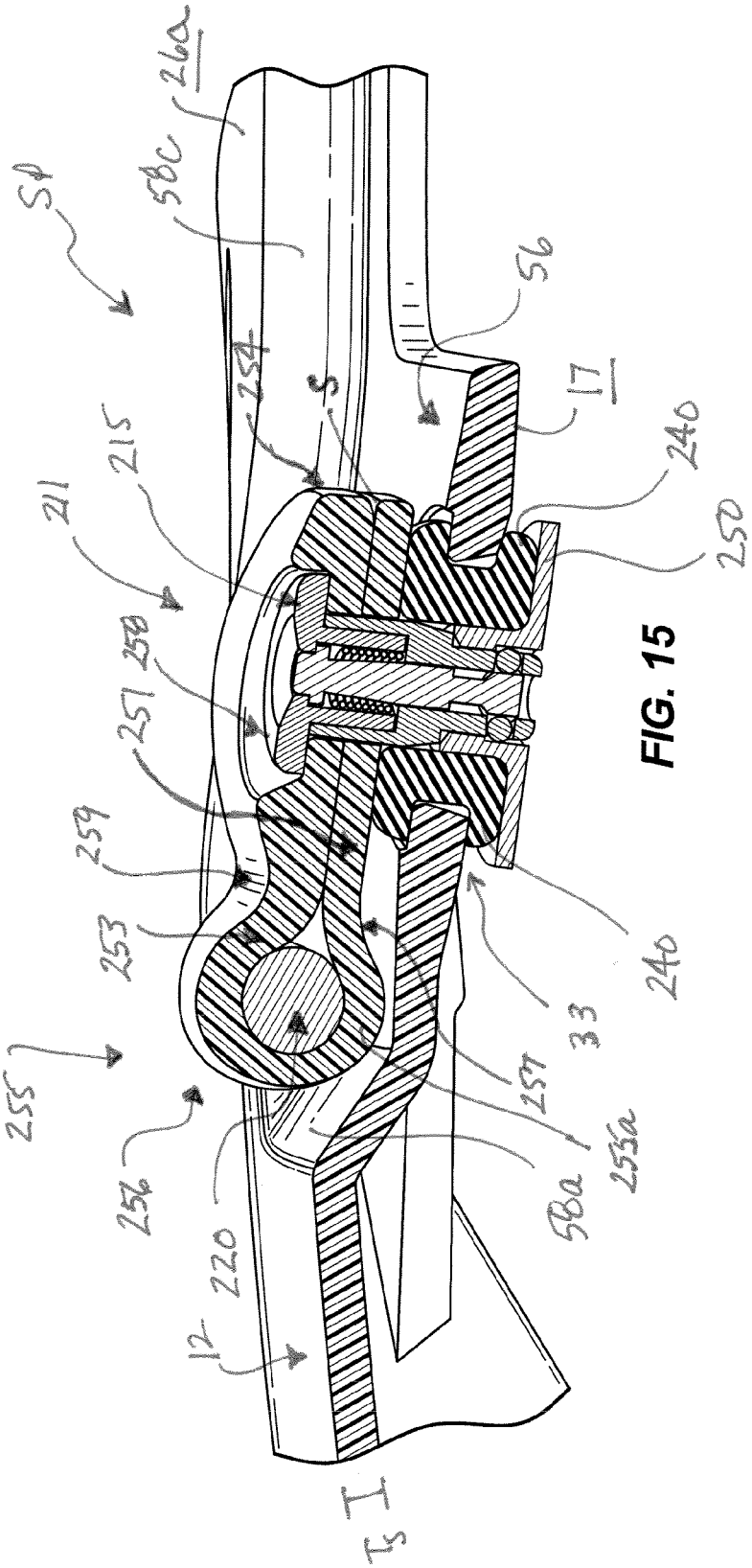

50
58c
260
56
17
254
S
215
211
240
250
258
251
259
253
240
33
257
255
256
58a
253a
220
12
T1
T2

FIG. 15

FOOTBALL HELMET WITH RECESSED FACE GUARD MOUNTING AREAS

CROSS-REFERENCE TO RELATED APPLICATIONS

[0001] The present application claims the benefit of priority under 35 U.S.C. §119 from U.S. Provisional Patent Application Ser. No. 61/763,802 entitled "PROTECTIVE SPORTS HELMET WITH ENGINEERED ENERGY DISPERSION SYSTEM," filed on Feb. 12, 2013, the disclosure of which is hereby incorporated by reference in its entirety for all purposes.

TECHNICAL FIELD

[0002] The invention relates to a protective football helmet that features a low-profile mounting configuration for a face guard that protects the player's facial area. The helmet includes an outer shell with recessed frontal mounting areas that ensure a low-profile connection of the face guard to the helmet.

BACKGROUND OF THE INVENTION

[0003] Protective helmets for contact sports, such as those used in football, hockey and lacrosse, typically include a rigid outer shell, an internal pad assembly coupled to an interior surface of the shell, a face guard or face mask, and a chin protector or strap that removably secures the helmet on the wearer's head. The face guard covers a front opening of the helmet shell and protects the wearer's facial area. Conventional face guards are formed from a plurality of intersecting elongated bars that define apertures through which the wearer looks through while participating in the contact sport. The face guard is secured to the helmet by connectors and brackets that fasten to the outer surface of the helmet shell. In this manner, the face guard resides external to and outside of the helmet shell.

[0004] In the last decade, the overall size of conventional protective helmets, including the helmet shell, has increased in an effort to improve the helmet's performance and impact performance. As the helmet size increases, the frontal profile of these helmets has also increased. The frontal profile is further increased when the face guard is secured to the helmet shell. The resulting frontal profile of the helmet and the face guard connected thereto can be visually dominant and unappealing to wearers of the helmet, as well as potential wearers of the helmet.

[0005] Features and advantages of the invention will be apparent to those skilled in the art upon review of the following detailed description and accompanying drawings.

SUMMARY OF THE INVENTION

[0006] The invention provides a football helmet having a low-profile face guard mounting configuration that provides a streamlined frontal appearance. The helmet includes a one-piece shell having a crown portion defining an upper region of the shell, a front portion extending generally forwardly and downwardly from the crown portion, left and right side portions extending generally downwardly and laterally from the crown portion. The front portion and the left and ride side portions collectively define a frontal opening in the shell, wherein the front opening includes opposed peripheral frontal edges. A lower recessed face guard attachment region extends along a lower extent of the opposed peripheral frontal edges and an upper recessed face guard attachment region extends along an upper extent of the opposed peripheral frontal edges. A face guard has opposed lower peripheral portions and opposed upper peripheral portions. To provide the low-profile face guard mounting configuration, the lower peripheral portions are secured to the lower recessed attachment regions by lower connector brackets and the upper peripheral portions are secured to the upper recessed attachment regions by upper connector brackets.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] The drawing figures depict one or more implementations in accord with the present teachings, by way of example only, not by way of limitation. In the figures, like reference numerals refer to the same or similar elements.

[0008] FIG. **1** is a front view of a football helmet of the invention, the helmet being worn by a player.

[0009] FIG. **2** is a perspective view of the football helmet.

[0010] FIG. **3**A is a left side view of the football helmet, showing a face guard and chin strap assembly connected to the helmet.

[0011] FIG. **3**B is a left side view of the football helmet, omitting the face guard and chin strap assembly.

[0012] FIG. **4** is a rear view of the football helmet.

[0013] FIG. **5** is a top view of the football helmet.

[0014] FIG. **6** is an enlarged perspective view of a recessed face guard mounting area of the football helmet, showing the face guard connected to the helmet shell.

[0015] FIG. **7** is an enlarged perspective view of an outer surface of the shell and the recessed face guard mounting area of the football helmet.

[0016] FIG. **8** is an enlarged perspective view of an inner surface of the shell and the recessed face guard mounting area of the football helmet.

[0017] FIG. **9** is a front view of the football helmet.

[0018] FIG. **10** is a front view of a prior art football helmet.

[0019] FIG. **11**A is a front view of the football helmet, including the face guard connected to the helmet shell.

[0020] FIG. **11**B is an enlarged view of the football helmet, showing the offset distance between the outer shell surface and the outer bracket surface.

[0021] FIG. **12**A is a front view of a prior art football helmet, including a face guard connected to the helmet shell.

[0022] FIG. **12**B is an enlarged view of the prior art football helmet, showing the offset distance between the outer shell surface and the outer bracket surface.

[0023] FIG. **13** is a partial top view of the football helmet.

[0024] FIG. **14** is a bottom view of the football helmet, showing the face guard and an internal pad assembly.

[0025] FIG. **15** is a partial cross-section of the football helmet taken along line **15-15** of FIG. **6**, showing an extent of the face guard connected to the recessed mounting area of the helmet.

DETAILED DESCRIPTION

[0026] While this invention is susceptible of embodiments in many different forms, there is shown in the drawings and will herein be described in detail preferred embodiments of the invention with the understanding that the present disclosure is to be considered as an exemplification of the principles of the invention and is not intended to limit the broad aspect of the invention to the embodiments illustrated.

[0027] FIGS. **1-15** illustrate a football helmet **10** with a durable, one-piece molded shell **12** that includes a face guard mounting system **50** featuring recessed mounting areas **54**, **56** that ensure a low-profile connection of the face guard **200** to the helmet **10**. This low-profile connection arrangement results in a streamlined, low-profile frontal appearance of the helmet **10**. In particular, FIGS. **1**, **2**, **3**A, **6** and **11-15** show the face guard **200** connected to the helmet **10** in the low-profile configuration. As a result of streamlined frontal appearance provided by the face guard mounting system **50**, the width of the face guard **200** closely corresponds to the width of the helmet **10** at the recessed mounting areas **54**, **56**. It is understood by those of skill in the art of designing protective sports helmets that different regions of a football helmet experience impacts of different types, magnitudes and durations during the course of playing the particular sport. It is also understood that the types, magnitudes and durations of impact forces upon a helmet are different in football, hockey and lacrosse because these sports differ in many significant ways, e.g., the underlying nature of the play, the number and type of players, the equipment worn by the players, and the playing surface. It is further understood that while playing football, a player may experience multiple impacts to the same or different regions of the helmet during a single play or a series of plays.

[0028] FIG. **1** shows the helmet **10** being worn by a wearer or player P. In addition to the face guard mounting system **50**, the helmet **10** includes the shell **12**, the facemask or face guard **200** attached at upper and lower frontal regions of the shell **12** by removable upper and lower connectors **211**, **213**. The face guard **200** comprises an arrangement of elongated and intersecting members **212** and is designed to span a frontal opening **14** in the shell **12** to protect the facial area and chin of the player P. The one-piece, molded (either injection or thermoformed) shell **12** is formed from impact resistant plastic or polymer materials, such as polycarbonate, acrylonitrile butadiene styrene (ABS), or nylon. The helmet **10** also includes a chin strap assembly **300** and an internal pad assembly **400** (see FIGS. **1**, **2** and **14**) that is detailed below.

[0029] As shown in the Figures, the shell **12** includes a curvilinear outer surface **16** featuring complex contours and facets. The shell **12** also includes a crown portion **18** defining a top region of the helmet **10**, a front portion **20** extending generally forwardly and downwardly from the crown portion **18**, left and right side portions **24** extending generally downwardly and laterally from the crown portion **18**, and a rear portion **22** extending generally rearwardly and downwardly from the crown portion **18**. The left and right side portions **24** each include an ear flap **26** positioned generally to overlie and protect the ear region of the player P when the helmet **10** is worn. Each ear flap **26** may be provided with an ear hole **30** to improve hearing for the wearer. The shell **12** is symmetric along a vertical plane dividing the shell **12** into left and right halves. When the helmet **10** is worn by the player P (see FIG. **1**), this vertical plane is aligned with the midsagittal plane that divides the player P (including his or her head) into symmetric right and left halves. Therefore, features shown in Figures as appearing in one half of the shell **12** are also present in the other half of the shell **12**. The helmet also has an engineered impact attenuation system that includes an impact attenuation member **42** which adjusts how the portion of the helmet **10** including the member **42** responds to impact forces compared to adjacent portions of the helmet **10** lacking the member **42**. The impact attenuation member **42** is formed by altering at least one portion of the shell **12** wherein that alteration changes the configuration of the shell **12** and its local response to impact forces applied substantially normal to the front shell portion **20**. For example, in the illustrated configuration, the impact attenuation member **42** includes a cantilevered segment or flap **44** formed in the front shell portion **20**. Compared to the adjacent portions of the shell **12** that lack the cantilevered segment **44**, the cantilevered segment **44** improves the attenuation of energy associated with impacts to at least the front shell portion **20**.

[0030] As shown in FIGS. **3**B, **7** and **9**, the frontal opening **14** in the helmet **10** is defined by a frontal edge **13** of the shell **12** wherein the frontal edge **13** includes left and right peripheral frontal edges **13***a* and a central frontal edge **13***b* that extends horizontally between the opposed peripheral frontal edges **13***a* which are substantially vertically oriented. The shell **12** also includes a pair of jaw flaps **34**, with each jaw flap **34** extending generally forwardly from a respective one of the ear flaps **26** for protection of the mandible area of the player P. The face guard mounting system **50** (see FIG. **1**) includes at least one recessed mounting region that extends vertically along the peripheral frontal edges **13***a* of the helmet shell **12**. In the illustrated configuration, each jaw flap **34** includes a first or lower recessed face guard attachment region **54** adjacent a lower extent **13***a***2** of the peripheral frontal edge **13***a*. A second or upper recessed face guard attachment region **56** is provided adjacent an upper extent **13***a***1** of the peripheral frontal edge **13***a*. The lower and upper recessed face guard attachment regions **54**, **56** have a generally trapezoidal configuration. Each attachment region **54**, **56** includes an aperture **33** that receives an elongated fastener **215** extending through the face guard connector **211**, **213** to removably secure the face guard **200** to the shell **12**. As explained below, the lower face guard attachment region **54** is recessed inward compared to the adjacent outer surface **34***a* of the jaw flap **34**, and the upper face guard attachment region **56** is recessed inward compared to the adjacent outer surface **26***a* of the ear flap **26**.

[0031] As shown in FIGS. **3**B, **7** and **9**, there is a sloped or angled transition wall **58** extending inward (towards the head of player P when the helmet **10** is worn) from the ear flap outer surface **26***a* and the jaw flap outer surface **34***a* to the recessed attachment regions **54**, **56**. Preferably, the transition wall **58** is oriented at an angle $\ominus$ greater than 90 degrees and less than 150 degrees (see FIG. **7**). Due to this arrangement, the outer surface **54***a* of the lower recessed region **54** is recessed inward from the jaw flap outer surface **34** and the outer surface **56***a* of the upper recessed region **56** is recessed inward from the ear flap outer surface **26***a*. The transition wall **58** extends rearward at a slight incline from the central frontal edge **13***b* and then downward and in close proximity to the peripheral edge **13***a*, then away from a frontal jaw flap edge **37***a*, and then downward to a lower jaw flap edge **37***b*. Accordingly, the transition wall **58** has multiple segments including a first lateral segment **58***a*, a first downward segment **58***b*, a second downward segment **58***c*, a third downward segment **58***d* and a fourth downward segment **58***e* that leads to the lower jaw flap edge **37***b*. Referring to FIG. **7**, the transition wall **58** extending from the ear flap **26** to the jaw flap **34** and the recessed face guard attachment regions **54**, **56** collectively form a corrugation in the helmet shell **12**, and thus do not involve either the removal of material from the shell **12** or a reduction in the wall thickness T_S of the shell **12**. Thus the shell's wall thickness T_S remains substantially constant across the majority of these regions of the shell **12**.

[0032] FIG. **8** shows the features of the inner shell surface **17** of the shell **12** including the ear opening **30**, the recessed face guard attachment regions **54**, **56** and the transition wall **58**. Because the lower and upper recessed face guard attachment regions **54**, **56** are recessed from the outer surface shell surface **16**, these features have a raised or embossed appearance compared to the inner shell surface **17**. Thus, these features are present and visually apparent in both the outer shell surface **16** and the inner shell surface **17**. Furthermore, the inner surface **54***b* of the lower attachment region **54** and the inner surface **56***b* of the upper attachment region **56** are recessed inward of the inner shell surface **17**. The upper recessed attachment region **56** also includes a substantially circular boss **56***c* formed on the inner shell surface **17** around the aperture **33**. Similarly, the lower recessed attachment region **54** includes a generally trapezoidal boss **54***c* formed on the inner shell surface **17** around the aperture **33**.

[0033] Referring to FIG. **7**, the transition wall **58** is stepped inward to form the corrugation in the shell **12** discussed above. At the apex **58***f* between the second and third downward segments **58***c,d*, the transition wall **58** has a height H_W of at least 0.125 inch, preferably at least 0.15 inch and most preferably between 0.15 inch and less than 0.275 inch. At the apex **58***f*, the transition wall **58** has a thickness T_W along its sloped surface of at least 0.25 inch, preferably at least 0.275 inch and most preferably at least 0.3 inch and less than 0.5 inch. At a midpoint of the fourth downward segment **58***e* that leads to the lower jaw flap edge **37***b*, the transition wall **58** has a reduced slope and thus a thickness T_W along its sloped surface of at least 0.3 inch, preferably at least 0.4 inch and most preferably at least 0.5 inch and less than 0.75 inch. The shell **12** has a nominal wall thickness T_S of 0.125 inch ±0.005 inch. These dimensions of the transition wall **58** and shell **12** ensure that the structural rigidity and flexural modulus of the helmet **10** are sufficiently high to enable the helmet **10** to withstand multiple impacts and impact forces, including those resulting from frontal impacts and slightly off-center frontal impacts.

[0034] FIGS. **9** and **10** provide a side-by-side view of the shell **12** of the inventive helmet **10** and the shell **512** of a prior art helmet **500** that lacks the lower and upper recessed face guard attachment region **54**, **56** and a number of other structural features of the helmet **10**. The shell **12** and shell **512** have substantially the same outer dimensions, for example outer width and overall height. Although not shown with the helmet **500** of FIG. **10**, some prior art football helmets include additional material added to the shell in the area surrounding the frontal opening and along the peripheral frontal edges and a central frontal edge that define the front opening. FIGS. **11**A and **12**A provide a side-by-side view of the inventive helmet **10**, including the face guard **200** secured to the helmet **10** by the connectors **211**, **213**, and the prior art helmet **500**, including face guard **700** secured to helmet **500** by the connectors **511**, **513**. For reference purposes, the prior art helmet **500** closely corresponds to the Riddell 360® football helmet, which was designed and currently marketed by Riddell, Inc., the Assignee of the present Application. The helmet **10** and the helmet **500** depicted in FIGS. **11** and **12** are adult size large models, which correspond to a hat size of 7-7.5 and a head circumference of 22-23.5 inches. These two Figures show the low-profile mounting arrangement of the face guard **200** to the helmet **10** as provided by the lower and upper recessed face guard attachment region **54**, **56**. The distance between the upper face guard connectors **211**, **511** represents the face guard width W_{FG}. Due to the lower and upper recessed face guard attachment region **54**, **56** and the resulting low-profile mounting of the face guard **200**, the face guard width W_{FG} of the helmet **10** is considerably less than the face guard width W_{FG} of the prior art helmet **500**, which lacks the low-profile mounting of the face guard **700**. In addition, the distance D**1** between the center of mass and the upper face guard connector **211** for the helmet **10** is less than the distance D**1** between the center of mass and the upper face guard connector **511** for the prior art helmet **500**. Similarly, the distance D**2** between the center of mass and the lower face guard connector **213** for the helmet **10** is less than the distance D**2** between the center of mass and the lower face guard connector **513** for the prior art helmet **500**.

[0035] FIG. **11**B is an enlarged view of the football helmet **10** showing an offset distance O between the outer shell surface **16** and the outermost surface **255***b* of the terminal end **255** of the upper connector right bracket **211**. FIG. **12**B is an enlarged view of the football helmet **510** showing an offset distance O between the outer shell surface **516** and the outermost surface **555***b* of the terminal end **555** of the upper connector right bracket **511**. As shown in FIGS. **11**B and **12**B and due to the low-profile connection of the face guard **200** to the helmet **10**, the offset O for the helmet **10** is considerably less than the offset O for the prior art helmet **510**. In the embodiment of the Figures, the offset O of the helmet **10** is less than 0.5 inch, preferably less than 0.45 inch and most preferably is 0.4 inch. Furthermore, the upper peripheral face guard portion **220** is closer to the outer shell surface **16** of the helmet **10** (see FIG. **11**B) compared to the distance between the upper peripheral face guard portion **720** and the outer shell surface **516** of the helmet **510** (see FIG. **12**B). Referring to FIG. **13**, there is an arc length AL extending along the uppermost bar **230** of the face guard **200** of the helmet **10**. The uppermost bar **230** extends along the front shell portion **20** but does not contact the lower front shell portion **20***a*. Because of the lower and upper recessed face guard attachment regions **54**, **56** and the resulting low-profile connection of the face guard **200** to the helmet, the arc length AL is less than the AL in the prior art helmet **500** (not shown).

[0036] Referring to FIG. **2**, when the face guard **200** is secured to the shell **12**, a lower peripheral portion **225** of the face guard **200** resides within the periphery of the lower recessed attachment region **54**, which is bounded by the transition wall **58**. Referring to FIGS. **6** and **15**, when the face guard **200** is secured to the shell **12**, an upper peripheral portion **220** of the face guard **200** having a U-shaped configuration resides within the periphery of the upper recessed attachment region **56**, which is also bounded by the transition wall **58**. The elongated fastener **215** is a multiple component, quick-release fastener that is described in co-pending U.S. patent application Ser. No. 12/082,920 and extends through the connector brackets **211**, **213**. A grommet **240** is positioned within the aperture **33** in the upper attachment region **56** wherein the fastener **215** and a retainer **250** extend through the grommet **240**. The connector bracket **211**, **213** has a clam shell configuration and includes an inner segment **251** and an outer segment **253** that converge to form a bulbous terminal end **255**. The terminal end **255** defines a receiver **256** that envelops or receives an extent of the peripheral portion **220** of the face guard **200**. Adjacent the peripheral portion **220**, the inner and outer segments **251**, **253** include a recess **257**, **259** leading to the aperture **258** that receives the fastener **215** in the secured position SP of FIGS. **6** and **15**. The inner and outer

segments **251**, **253** meet at a seam S that extends longitudinally from a leading end **254** to the receiver **256**. In the secured position SP, an inner portion **255***a* of the terminal end **255** and the inner bracket segment **251** reside inward of the outer shell surface **16**, including the outer ear flap surface **26***a*. Also, an inner surface and inner portion of the peripheral face guard portion **220** also reside inward of the outer shell surface **16**, including the outer ear flap surface **26***a*. These positional relationships are primarily due to the upper recessed attachment region **56** which, along with the lower recessed attachment region **54**, provides the low-profile connection of the face guard **200** to the helmet shell **12**.

[0037] Referring to FIG. **14**, the face guard **200** has a lower bar **260** that has opposed substantially linear peripheral segments **262**, substantially linear inward transition segments **265** and a curvilinear intermediate segment **270**. The peripheral and transition segments **262**, **265** combine to follow along the radius of curvature (shown in dotted lines) defined by the lower edge **37***b* of the jaw flap **54**. The configuration of the lower bar **260**, including its segments **262**, **265** and **260**, and the jaw flap **54** further ensure the low-profile mounting configuration of the face guard **200** to the shell **12**. As shown in the Figures, the helmet **10** includes four distinct recessed regions—a pair of first or upper recessed attachment regions **56** and a pair of second or lower recessed attachment regions **54**—and four distinct face guard connectors—a pair of first or upper connectors **211** and a pair of second or lower connectors **213**—that collectively provide four connection points for the face guard **200** to the shell **12**. This configuration renders unnecessary the need for a connection point along the lower front shell portion **20***a* for the upper bar of the face guard **200**. In another embodiment, the helmet **10** is configured with either the upper recessed attachment regions **56** and connectors **211**, or the lower recessed attachment regions **54** and connectors **213** along with a connection point on the front shell portion **20** along the central frontal edge **13***b*. This frontal connection point can have a recessed configuration consistent with the upper and lower recessed attachment regions **54**, **56**. This alternate configuration provides four face guard connection points, wherein at least two of the connection points feature a recessed attachment region.

[0038] As shown in FIG. **2**, chin strap securement member **310** is positioned rearward of the upper face guard attachment region **56** and is configured to receive an upper strap member **312** of the chin strap assembly **300**. A multi-adjustable chin strap securement member **320**, which is positioned rearward of the lower face guard attachment region **54** and along a lower side shell edge **13***c*, is configured to receive a lower strap member **314** of the chin strap assembly **300**. The multi-adjustable chin strap securement member **320** is received by a receptacle **325** (see FIG. **3**B) formed in a lower portion of the shell **12**. In the use position shown in FIGS. **1** and **3**, the upper strap member **312** extends between the upper peripheral portion **220** of the face guard **200** and the upper attachment region **56**. More specifically, the upper strap member **312** extends through a gap or clearance formed between the outer surface of the upper attachment region **56** and the inner surface of the upper peripheral face guard portion **220**. The upper strap member **312** can engage the second downward segment **58***c* of the transition wall **58**.

[0039] The helmet **10** also includes a raised central band **62** that extends from the front shell portion **20** across the crown portion **18** to the rear shell portion **22**. The band **62** is defined by a pair of substantially symmetric raised sidewalls or ridges **66***a*, **66***b* that extend upwardly at an angle from the outer shell surface **16**. When viewed from the side, the sidewalls **66***a*, **66***b* define a curvilinear path, preferably continuous, as they extend across the crown portion **18** to the rear shell portion **22**. As shown in FIG. **13**, a front portion **64** of the band **62** is coincident with the impact attenuation member **42** and is positioned a distance above the central frontal edge **13***b*. Referring to FIGS. **4** and **5**, the band **62** has a width that increases as the band **62** extends from the front shell portion **20** across the crown portion **18** to the rear shell portion **22**. As shown in FIGS. **3**, **4** and **7**, a rear portion **68** of the band **62** is coincident with and merges with a rear raised band **70** that extends transversely between the left and right side portions **24** of the shell **12**. Similar to the sidewalls **66***a*, **66***b*, the rear band sidewalls **72**, **74** are sloped meaning they extend outwardly and upwardly at angle from the outer shell surface **16**. Referring to FIG. **4**, a lower channel **80** extends transversely below the raised rear band **70** and above a lower rear shell edge **81**.

[0040] As shown in the Figures, the helmet **10** further includes numerous vent openings that are configured to facilitate air circulation within the helmet **10** when it is worn by the player P. A first pair of vent openings **84** are formed in the crown portion **18**, wherein the left vent opening **84***a* is substantially adjacent the left sidewall **66***a* and the right vent opening **84***b* is substantially adjacent the right sidewall **66***b*. A second pair of vent openings **86** are formed in the rear shell portion **22**, wherein the left vent opening **86***a* is substantially adjacent the left sidewall **66***a* and left band sidewall **72**, and the right vent opening **86***b* is substantially adjacent the right sidewall **66***b* and right band sidewall **74**. The left first and second vent openings **84***a*, **86***a* are substantially aligned along the left sidewall **66***a*, and the right first and second vent openings **84***a*, **86***a* are substantially aligned along the right sidewall **66***b*. A third pair of vent openings **88** are formed in the rear shell portion **22** below the rear raised band **70**, wherein the left vent opening **88***a* is positioned adjacent a left ridge **87***a* and the right vent opening **88***b* is positioned adjacent a right ridge **87***b*. A fourth pair of vent openings **90** are formed in the front shell portion **20**, wherein the left vent opening **90***a* is positioned adjacent a left frontal ridge **92***a* and the right vent opening **90***b* is positioned adjacent a right frontal ridge **92***b*. The frontal ridges **92***a,b* are located between the front shell portion **20** and the side portion **24** and thus generally overlie the temple region of the player P when the helmet **10** is worn. The first, second, third and fourth vent openings **84***a,b*, **86***a,b*, **88***a,b* and **90***a,b* are cooperatively positioned with voids in the internal padding assembly **400** to facilitate the flow of air through the helmet **10**.

[0041] As shown in FIG. **14**, the helmet **10** includes an internal padding assembly **400** with a front pad **410** that structurally and functionally interacts with the impact attenuation member **42**. As such, the engineered impact attenuation system comprises both the cantilevered segment **44** and the front pad **410**. The internal padding assembly **400** also comprises a crown pad assembly **412**, left and right ear flap pad assemblies **414***a,b*, left and right jaw flap pad assemblies **416***a,b*, and rear pad assembly **418**. The internal padding assembly **400** also includes a relatively thin, padded overliner **420** that is positioned against the player's P head when the helmet **10** is worn. It is understood that the overliner **420**, the crown pad assembly **412**, the left and right ear flap pad assemblies **414***a,b*, the left and right jaw flap pad assemblies **416***a,b*,

and the rear pad assembly **418** can include a number of distinct pad members formed from one or more energy absorbing materials.

[0042] It is to be understood that the invention is not limited to the exact details of construction, operation, exact materials or embodiments shown and described, as obvious modifications and equivalents will be apparent to one skilled in the art; for example, the entire cantilever strap could be provided with a shock absorbing pad disposed upon its lower surface. Accordingly, the invention is therefore to be limited only by the scope of the appended claims. While the specific embodiments have been illustrated and described, numerous modifications come to mind without significantly departing from the spirit of the invention, and the scope of protection is only limited by the scope of the accompanying Claims.

What is claimed is:

1. A football helmet having a low-profile face guard mounting configuration, the helmet comprising:

a one-piece shell including:

a crown portion defining an upper region of the shell;

a front portion extending generally forwardly and downwardly from the crown portion;

left and right side portions extending generally downwardly and laterally from the crown portion, wherein the front portion and the left and ride side portions collectively define a frontal opening in the shell, wherein the front opening includes opposed peripheral frontal edges;

a lower recessed face guard attachment region extending along a lower extent of the opposed peripheral frontal edges; and

a face guard having a plurality of intersecting elongated members and opposed lower peripheral portions, wherein the lower peripheral portions are secured to the lower recessed attachment regions by lower connector brackets affixed to the lower recessed attachment regions to provide the low-profile face guard mounting configuration.

2. The football helmet of claim **1**, wherein the lower recessed face guard attachment regions are adjacent the peripheral frontal edge of the shell.

3. The football helmet of claim **1**, wherein the lower recessed face guard attachment region is defined by an angled transition wall formed in the shell.

4. The football helmet of claim **1**, further comprising an elongated fastener that extends through the lower connector bracket and the lower recessed attachment region.

5. The football helmet of claim **1**, further comprising an upper recessed face guard attachment region extending along an upper extent of the opposed peripheral frontal edges.

6. The football helmet of claim **5**, wherein the upper recessed face guard attachment regions are adjacent the peripheral frontal edge of the shell.

7. The football helmet of claim **5**, wherein the upper recessed face guard attachment regions are defined by an angled transition wall formed in the shell.

8. The football helmet of claim **5**, wherein the face guard has opposed upper peripheral portions, wherein the upper peripheral portions are secured to the upper recessed attachment regions by upper connector brackets s affixed to the upper recessed attachment regions.

9. The football helmet of claim **5**, further comprising an elongated fastener that extends through the upper connector bracket and the upper recessed attachment region.

10. The football helmet of claim **8**, wherein the upper recessed face guard attachment region is defined by an angled transition wall formed in the shell, and wherein the upper connector brackets are positioned between the angled transition wall and the peripheral frontal edge of the shell.

11. The football helmet of claim **1**, wherein the lower recessed face guard attachment region is defined by an angled transition wall formed in the shell, and wherein the first pair of connectors are positioned between the angled transition wall and a frontal edge of the shell.

* * * * *