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(54) **ADJUSTABLE SPORTS HELMET**

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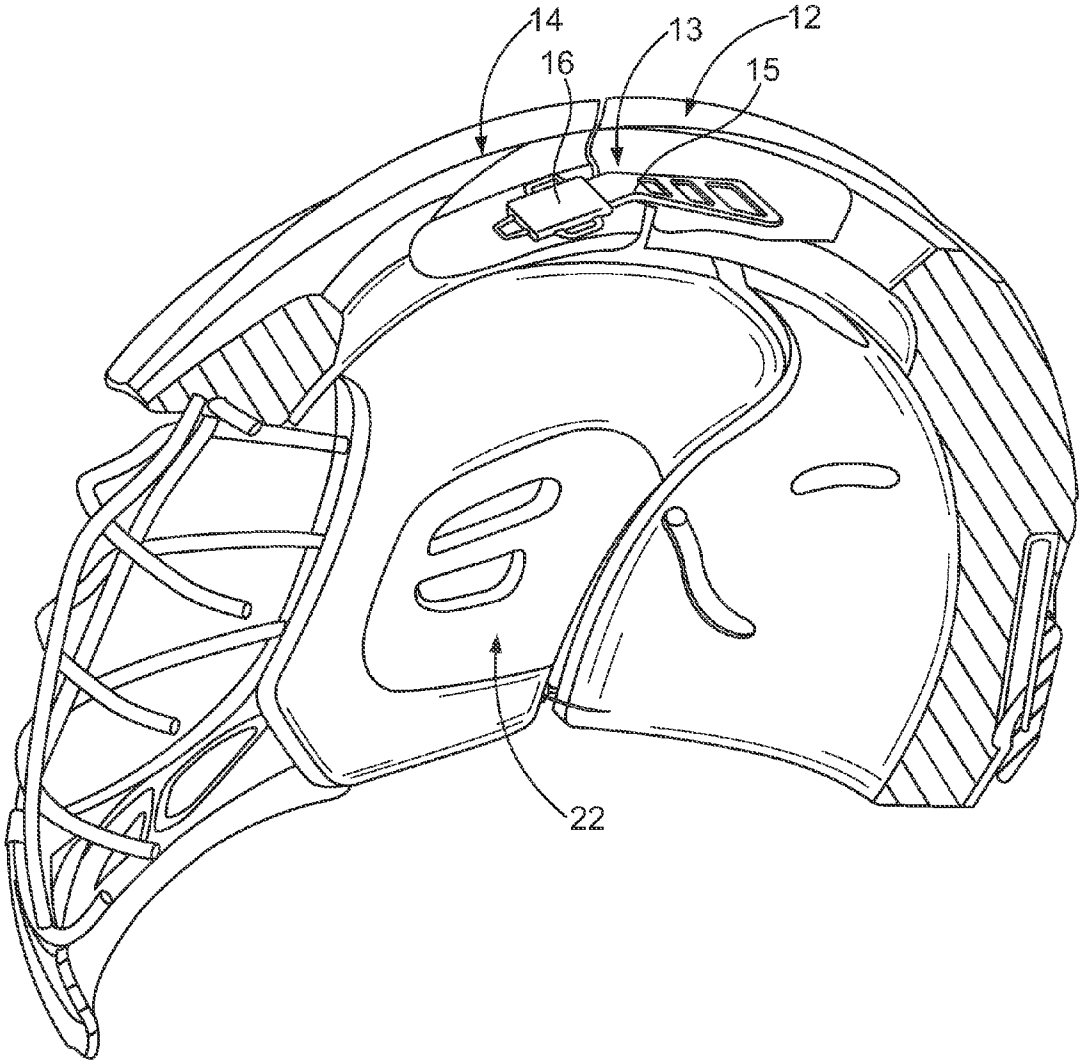
(52) **U.S. Cl.**

USPC **2/411**; 2/425; 2/421; 2/424

(57) **ABSTRACT**

A protective sports helmet includes one or more features that promote efficient fit adjustment and efficient donning and removal of the helmet. The helmet optionally includes a front shell portion pivotably connected to a rear shell portion to promote easy donning and removal of the helmet. The upper region of the front shell optionally is longitudinally adjustable relative to the upper region of the rear shell, as well. Cam mechanisms optionally are provided on the helmet shell for securing straps of a chin cup at desired lengths. The cam mechanisms optionally each include a self-energizing grip member that increasingly engages the strap when the strap is pulled taut while the cam mechanism is in the locked position. A face guard optionally is attached within the helmet shell structure, which provides a smooth helmet exterior and promotes distributed energy transfer from the face guard to the helmet shell.



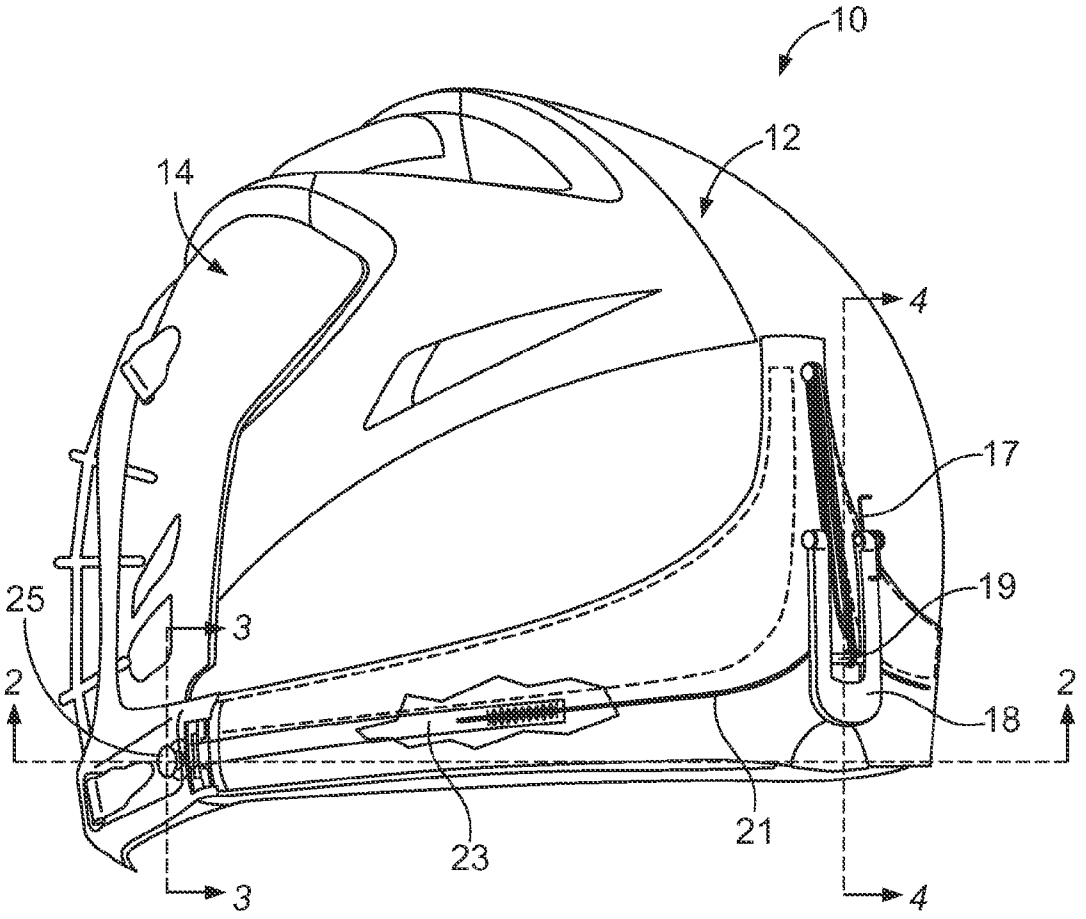


FIG. 1

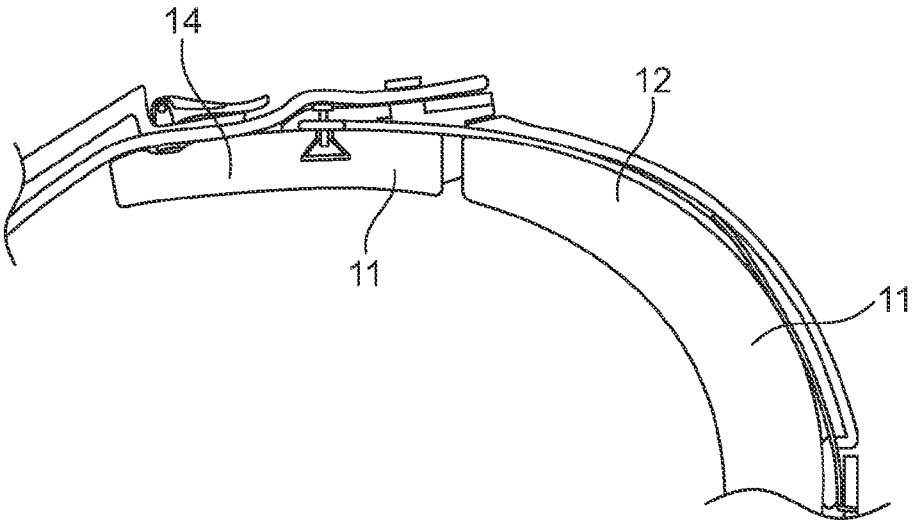


FIG. 2

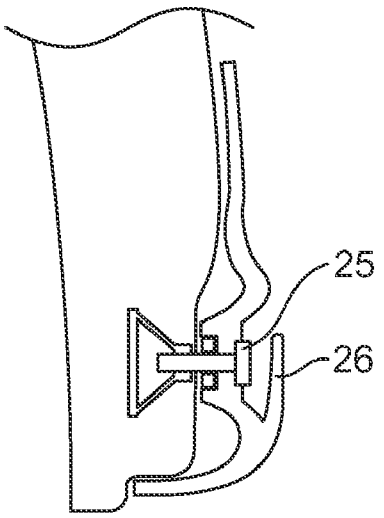


FIG. 3

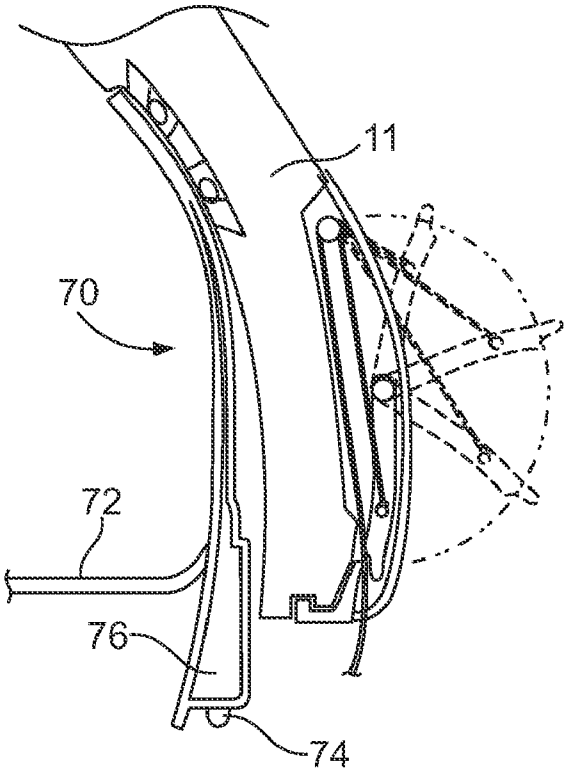


FIG. 4

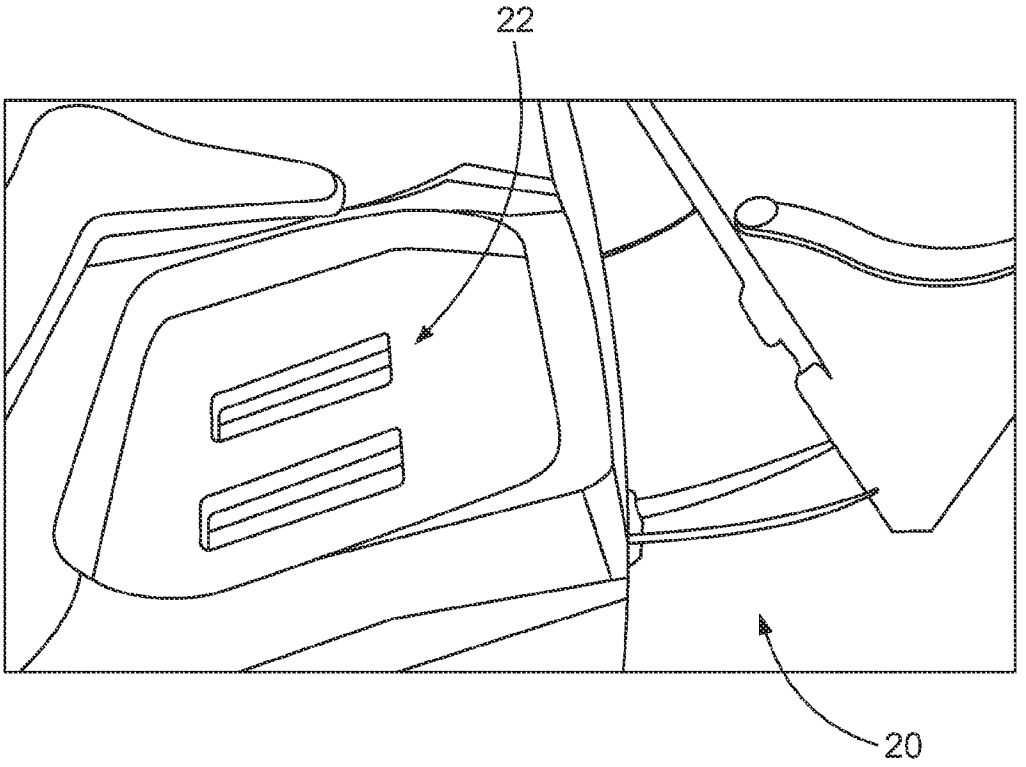


FIG. 5

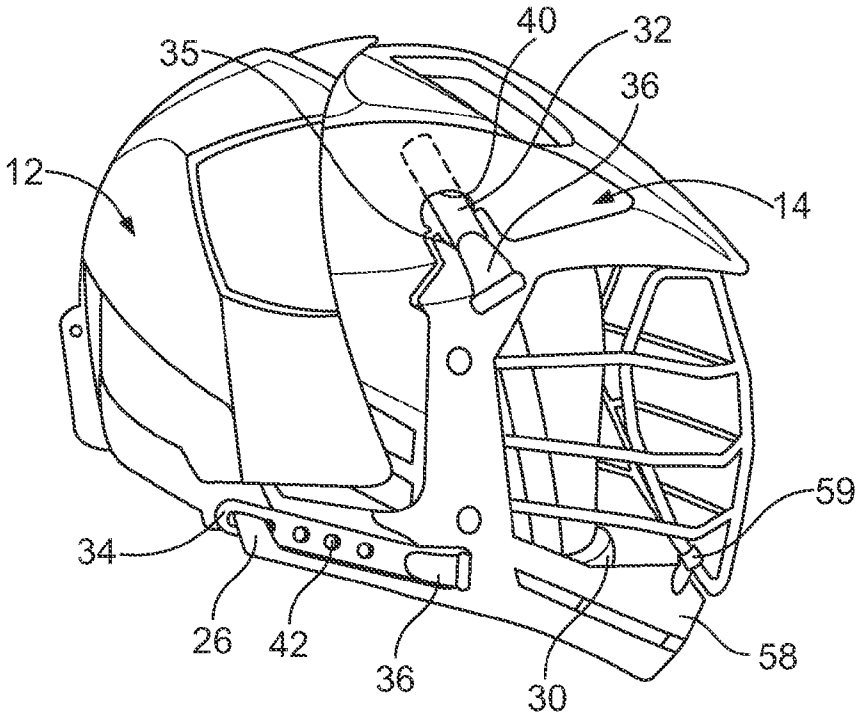


FIG. 6

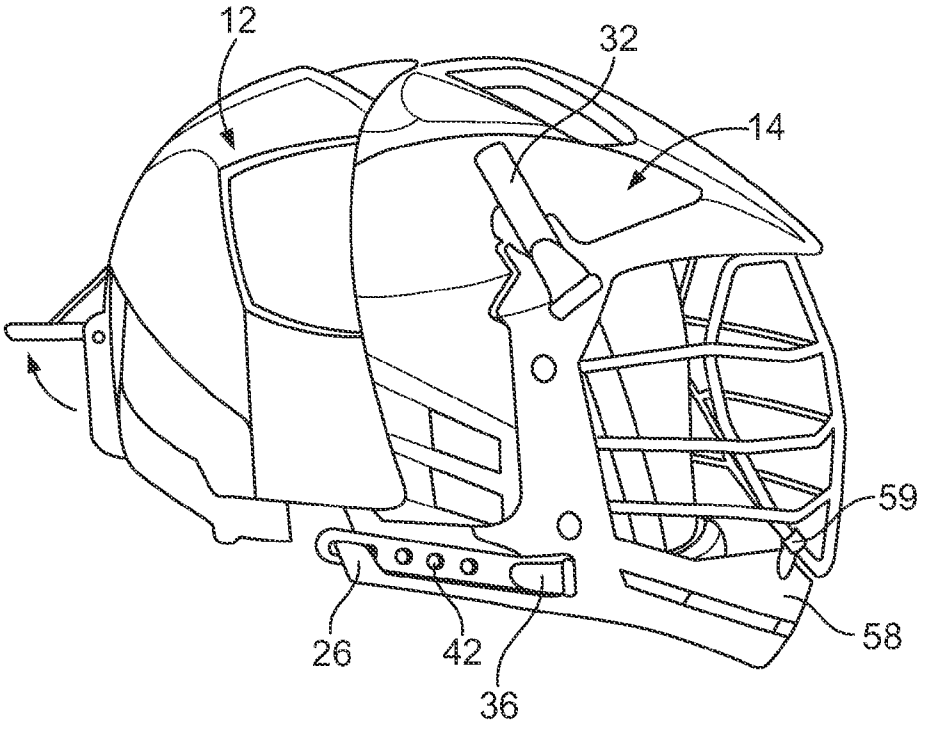


FIG. 7

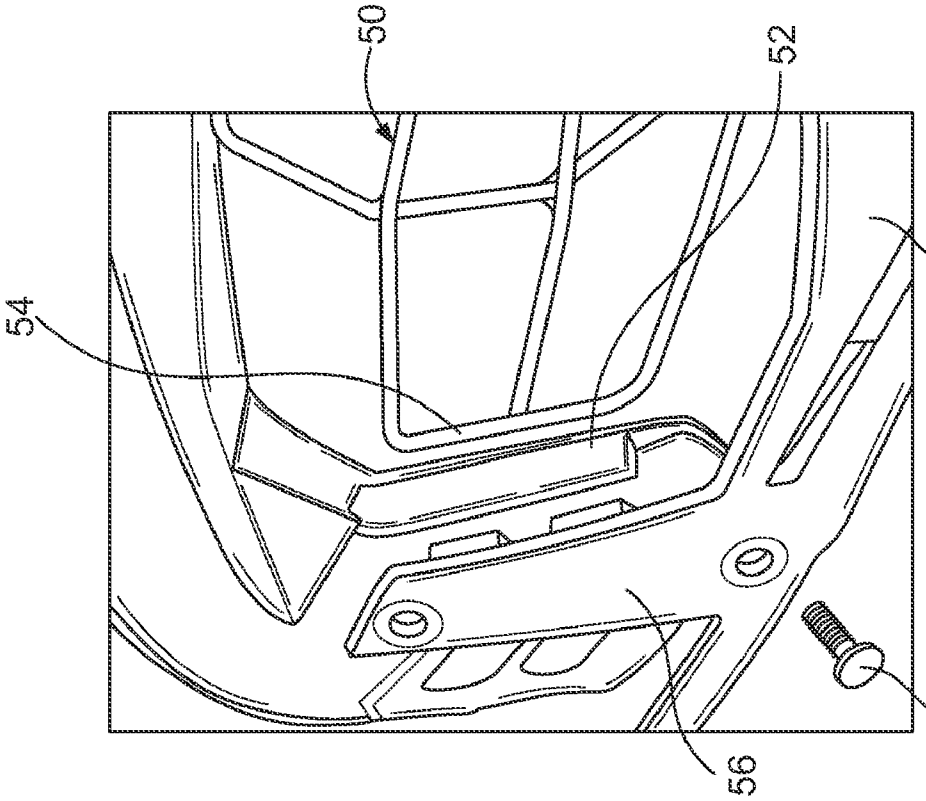


FIG. 9

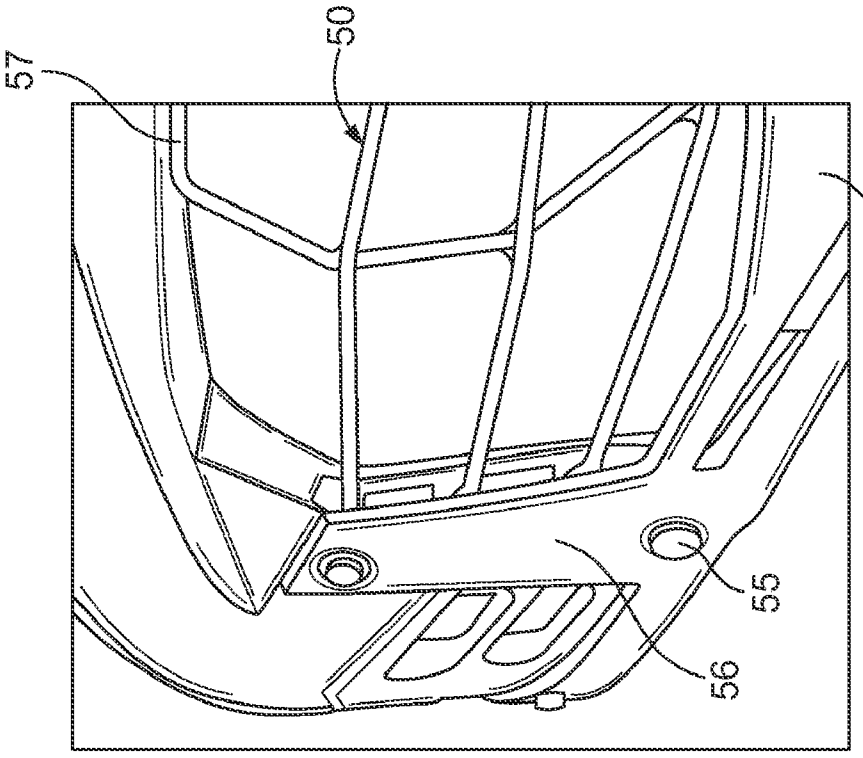


FIG. 8

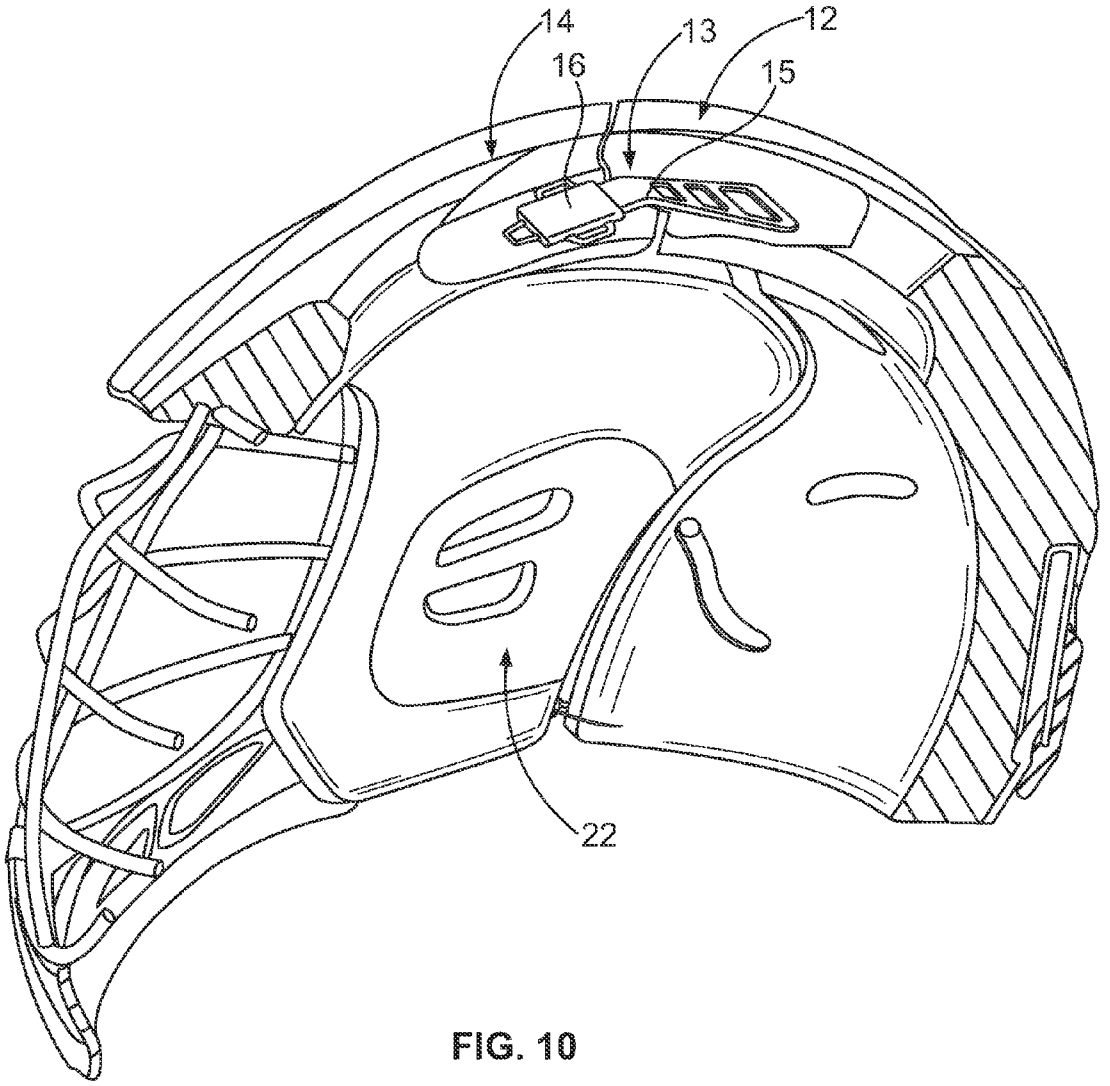


FIG. 10

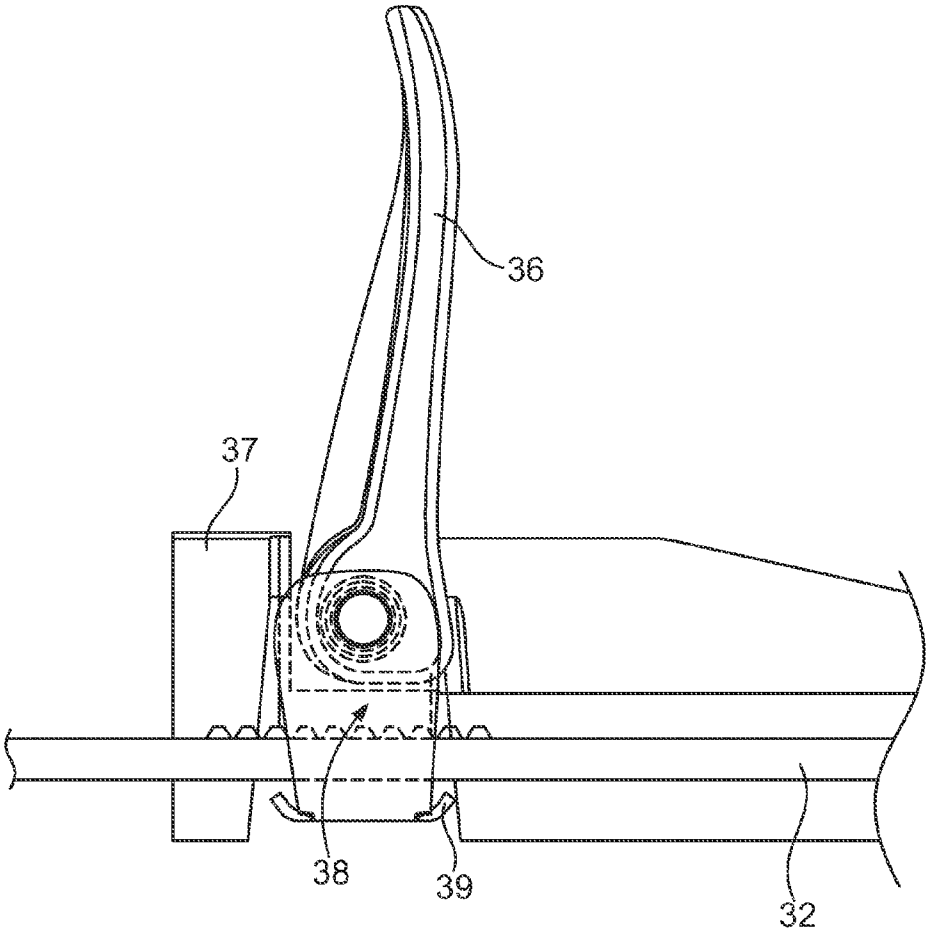


FIG. 11A

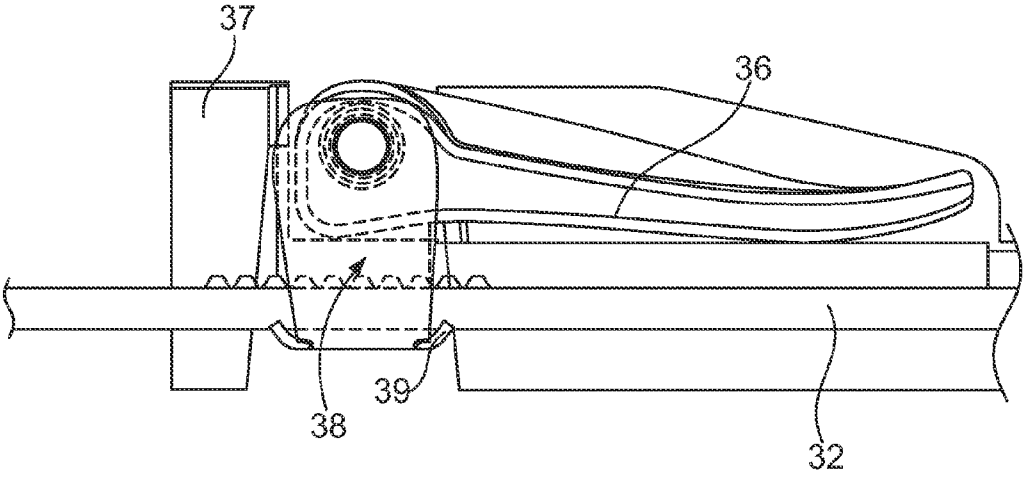


FIG. 11B

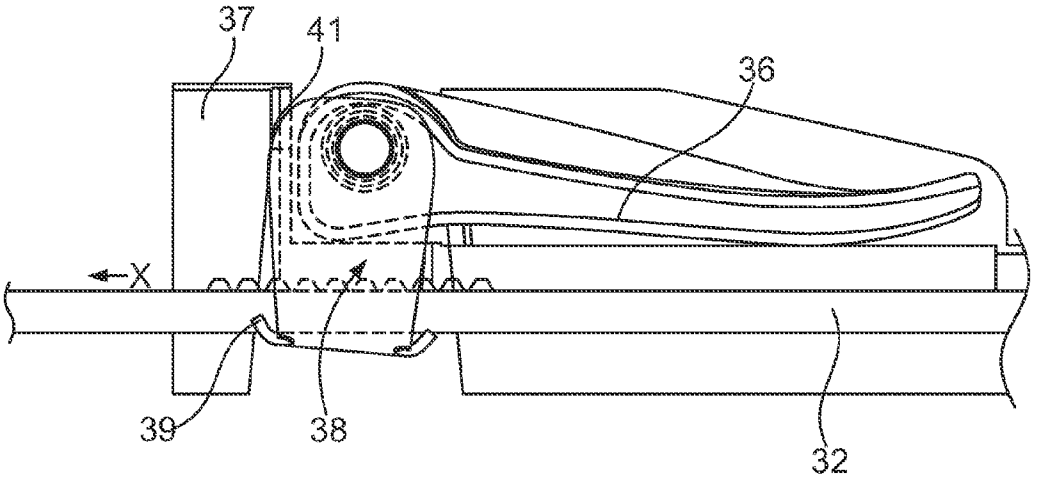


FIG. 11C

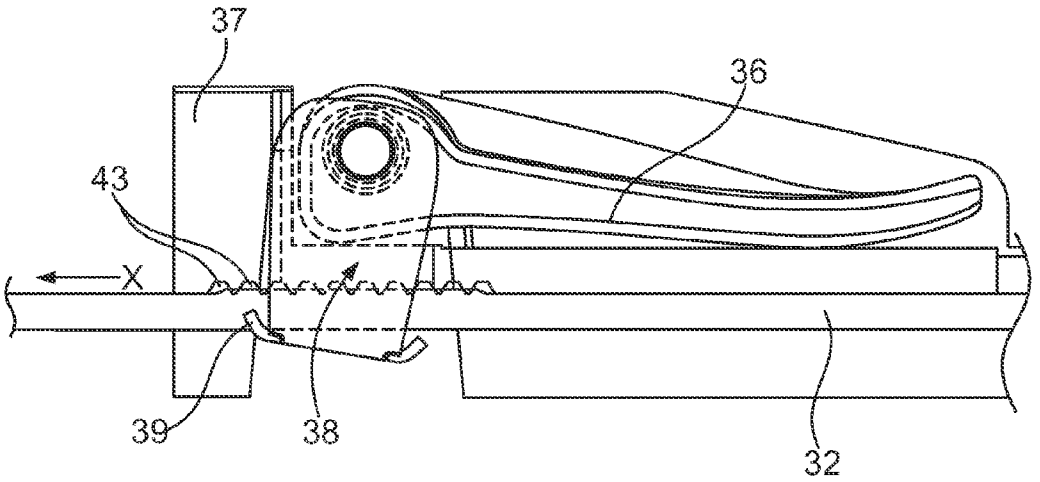


FIG. 11D

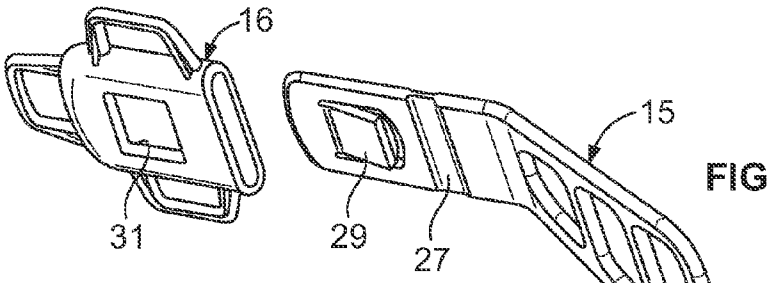


FIG. 12A

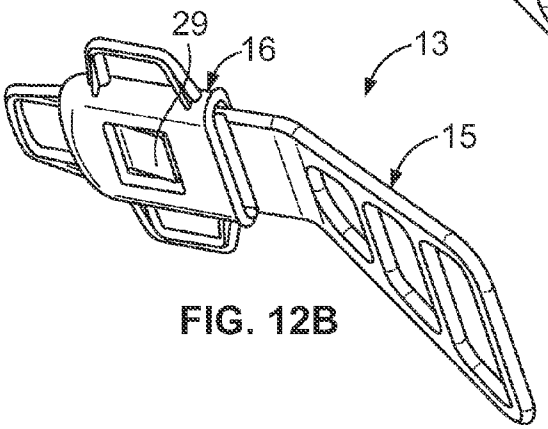


FIG. 12B

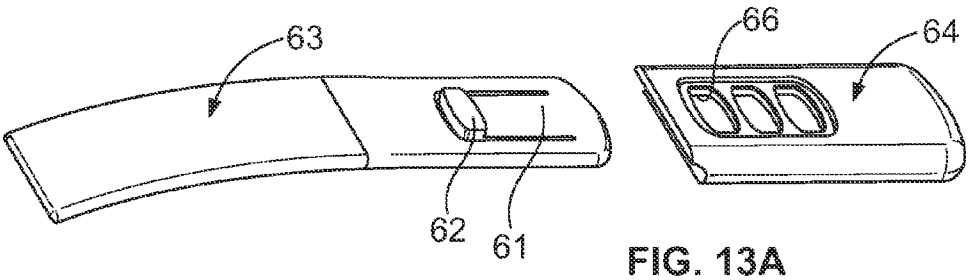


FIG. 13A

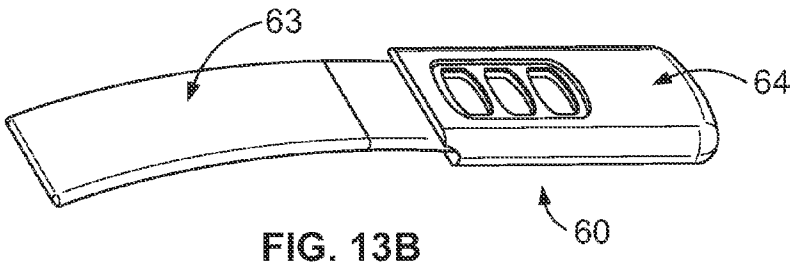


FIG. 13B

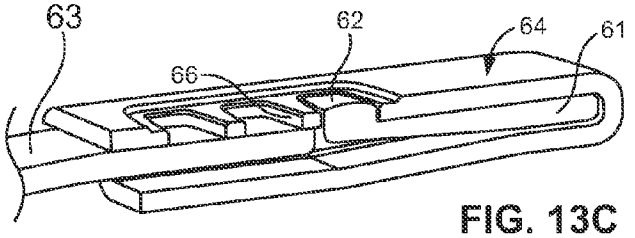


FIG. 13C

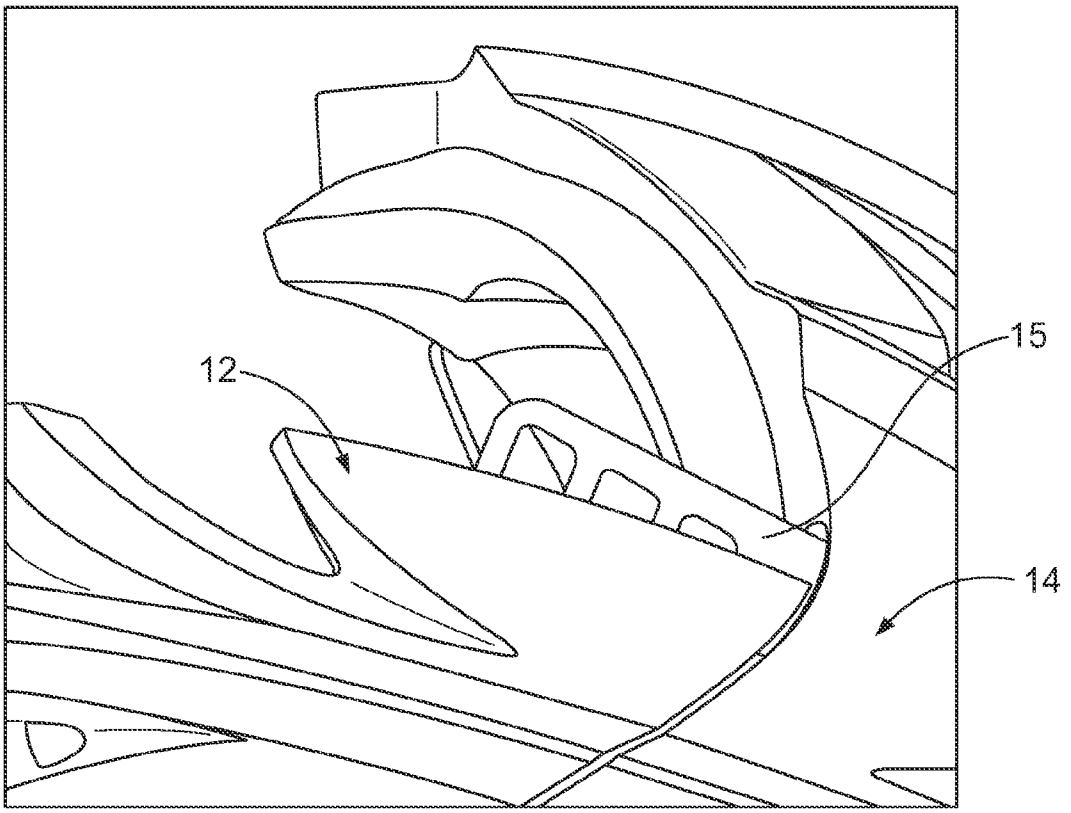


FIG. 14

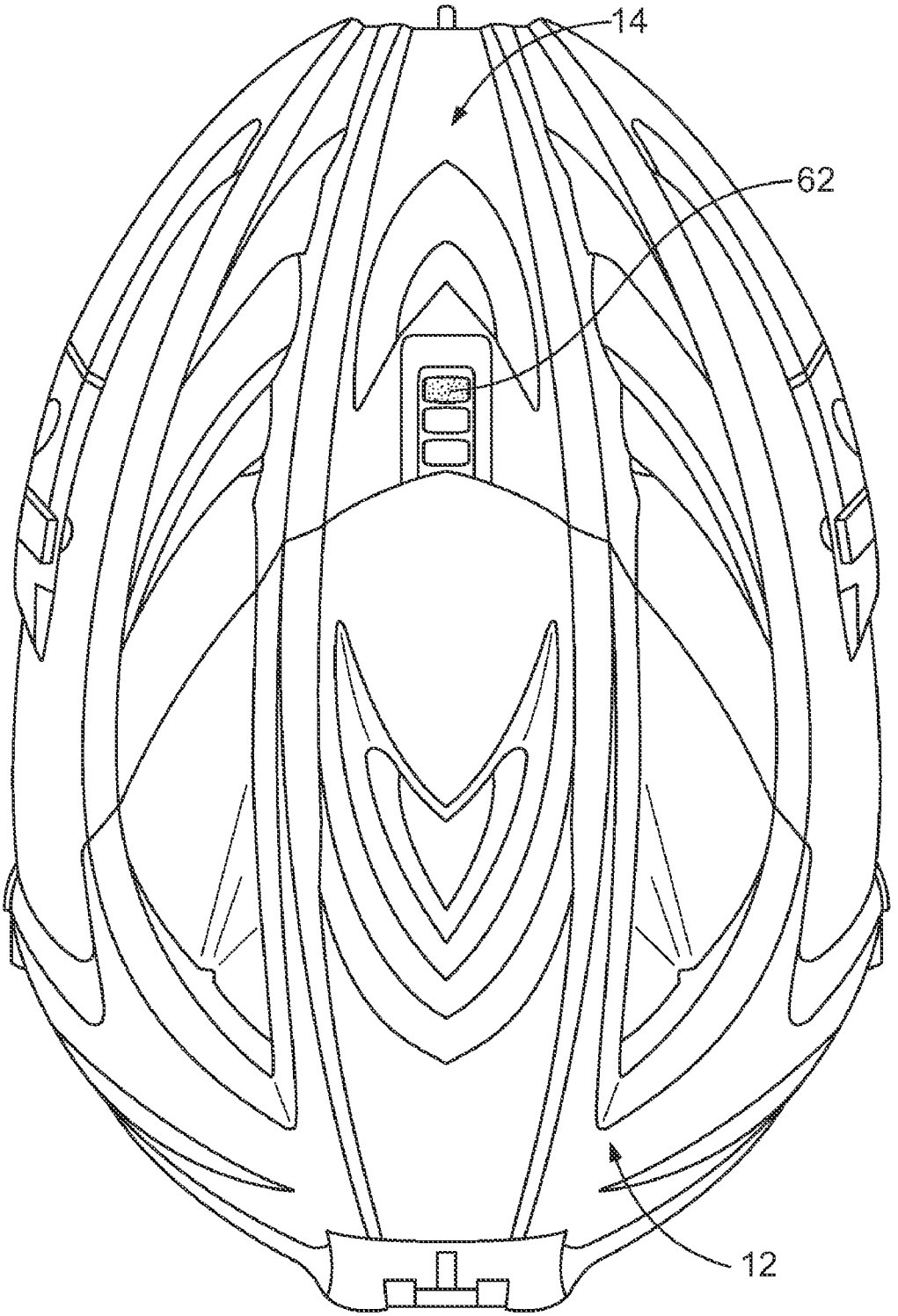


FIG. 15

ADJUSTABLE SPORTS HELMET

BACKGROUND

[0001] Existing protective sports helmets, such as helmets for lacrosse, hockey, football, and baseball, can be difficult to don, and it can be challenging for a user to make efficient fit adjustments, particularly during a game. For example, when a wearer pulls on a typical sports helmet, he or she has to pull the sides out laterally to fit the helmet over the wearer's ears. This often results in the fit not being ideally snug in a lateral direction. Further, a helmet that fits a given wearer well in the lateral direction may not fit well in a longitudinal direction. Adjusting or attaching the chin straps also can be difficult, particularly when the wearer does so while wearing lacrosse or hockey gloves.

[0002] Protective face masks, face cages, or face guards on existing sports helmets typically are attached to the exterior of the helmet shell via clips, straps, or loops. While the face guards are generally secured in place, they tend to move or slide slightly during play, and are not particularly adept at distributing energy from impacts.

SUMMARY

[0003] A protective sports helmet, such as a lacrosse, hockey, football, or baseball helmet, includes one or more features that promote efficient fit adjustment and efficient donning and removal of the helmet. In one embodiment, the helmet includes a front shell portion hingedly or pivotably connected to a rear shell portion. The lower region of the front shell portion is pivotable away from the lower region of the rear shell portion to provide ear channels and to promote easy donning and removal of the helmet. The upper region of the front shell may additionally or alternatively be longitudinally adjustable relative to the upper region of the rear shell via a multi-position, longitudinal adjustment mechanism.

[0004] Cam mechanisms optionally are provided on the helmet shell for securing straps of a chin cup or chin guard assembly at desired lengths. The cam mechanisms optionally each include a self-energizing grip member that increasingly engages the strap when the strap is subjected to a load while the cam mechanism is in the locked position. A face guard optionally is attached within the helmet shell structure, which provides a smooth helmet exterior and promotes distributed energy transfer from the face guard to the helmet shell.

[0005] Other features and advantages will appear hereinafter. The features described above can be used separately or together, or in various combinations of one or more of them.

BRIEF DESCRIPTION OF THE DRAWINGS

[0006] In the drawings, wherein the same reference number indicates the same element throughout the views:

[0007] FIG. **1** is a rear-perspective view of a sports helmet including a front shell portion pivotably attached to a rear shell portion, according to one embodiment.

[0008] FIG. **2** is a sectional view taken along line **2-2** in FIG. **1**.

[0009] FIG. **3** is a sectional view taken along line **3-3** in FIG. **1**.

[0010] FIG. **4** is a sectional view taken along line **4-4** in FIG. **1**.

[0011] FIG. **5** is a partial interior view of the ear region of the helmet shown in FIG. **1** with the helmet in the open position.

[0012] FIG. **6** is a side view of the helmet shown in FIG. **1** in the closed position.

[0013] FIG. **7** is a side view of the helmet shown in FIG. **1** in the open position.

[0014] FIG. **8** is a partial perspective view of the helmet shown in FIG. **1** with the face guard attached.

[0015] FIG. **9** is a partial perspective view of the helmet section shown in FIG. **1** with the face guard detached.

[0016] FIG. **10** is a side-sectional view of the helmet shown in FIG. **1**.

[0017] FIG. **11**A is a side view of a cam mechanism, according to one embodiment, in an open position, with the base region of the cam mechanism shown as transparent to reveal details of the cam lever.

[0018] FIG. **11**B is a side view of the cam mechanism shown in FIG. **11**A in a locked position.

[0019] FIG. **11**C is a side view of the cam mechanism shown in FIGS. **11**A and **11**B in a locked position with the grip member pivoted to further engage the strap under a loading condition.

[0020] FIG. **11**D is a side view of the cam mechanism shown in FIGS. **11**A-**11**C in a locked position with the grip member further pivoted to further engage the strap under an extreme loading condition.

[0021] FIG. **12**A is an exploded view of the hinge mechanism shown in FIG. **10**.

[0022] FIG. **12**B is a perspective view of the hinge mechanism shown in FIG. **12**A.

[0023] FIG. **13**A is an exploded view of a longitudinal adjustment mechanism, according to one embodiment.

[0024] FIG. **13**B is a perspective view of the longitudinal adjustment mechanism shown in FIG. **13**A.

[0025] FIG. **13**C is a side-sectional view of the longitudinal adjustment mechanism shown in FIGS. **13**A and **13**B.

[0026] FIG. **14** is a partial, top perspective view of the helmet shown in FIGS. **1-10** with a section of the rear shell portion cutaway to show the overlap of the rear and front shell portions.

[0027] FIG. **15** is a top perspective view of a helmet including the longitudinal adjustment mechanism shown in FIGS. **13**A-**13**C, according to one embodiment.

DETAILED DESCRIPTION OF THE DRAWINGS

[0028] Various embodiments of the invention will now be described. The following description provides specific details for a thorough understanding and enabling description of these embodiments. One skilled in the art will understand, however, that the invention may be practiced without many of these details. Additionally, some well-known structures or functions may not be shown or described in detail so as to avoid unnecessarily obscuring the relevant description of the various embodiments.

[0029] The terminology used in the description presented below is intended to be interpreted in its broadest reasonable manner, even though it is being used in conjunction with a detailed description of certain specific embodiments of the invention. Certain terms may even be emphasized below; however, any terminology intended to be interpreted in any restricted manner will be overtly and specifically defined as such in this detailed description section.

[0030] Where the context permits, singular or plural terms may also include the plural or singular term, respectively. Moreover, unless the word "or" is expressly limited to mean only a single item exclusive from the other items in a list of

two or more items, then the use of "or" in such a list is to be interpreted as including (a) any single item in the list, (b) all of the items in the list, or (c) any combination of items in the list.

[0031] Turning now in detail to the drawings, as shown in FIGS. **1-10**, a sports helmet **10**, such as a lacrosse, hockey, football, or baseball helmet, includes a rear shell portion **12** and a front shell portion **14**. The front and rear shell portions **14**, **12** may be made of a polymer material, a composite material, or of another suitable material.

[0032] An upper region of the rear shell portion **12** is connected to an upper region of the front shell portion **14** via a hinge **13** (shown in FIG. **10**), such as a mechanical hinge or living hinge, or via another connecting mechanism that provides pivoting movement between the front and rear shell portions. In this manner, the front and rear shell portions **14**, **12** are rotatable between a closed, use position, and an open position that promotes efficient donning and removing of the helmet **10**.

[0033] In one embodiment, the hinge **13** includes a male portion **15** attached directly or indirectly to, or integral with, one of the front and rear shell portions **14**, **12**, and a female portion **16** attached directly or indirectly to, or integral with, the other of the front and rear shell portions **14**, **12**. In the illustrated embodiment, a male portion **15** including a locking tab **29** and a living hinge region **27** is attached to the rear shell portion **12**. A female portion **16** including an opening **31** that receives the locking tab **29** is attached to the front shell portion **14**. The hinge portions **15**, **16** may be attached via screws, bolts, adhesive, as part of the molding process, or via any other suitable mechanism or process.

[0034] One or more sections or a system of energy-attenuating material **11**, such as expanded polypropylene ("EPP") foam or another shock-absorbing material, are adhered or otherwise affixed to the inner surfaces of the front and rear shell portions **14**, **12**. The energy-attenuating material **11** alternatively may be in-molded with the front and rear shell portions **14**, **12**. While the primary pad material in the helmet is made of energy-attenuating or shock-absorbing material, comfort padding may also be included, particularly in regions intended to engage sensitive areas of a wearer's face, such as the cheeks. Comfort padding also may be used to provide customized fit and enhanced fit stability. Multi-layer padding, including an outer layer of energy-attenuating material and an inner layer of comfort padding, may optionally be used in these sensitive areas.

[0035] Other energy management systems may alternatively or additionally be included in the helmet **10**. For example, an inflated air bladder system may be used instead of a foam liner. As another example, a series of inwardly protruding structures that crush to absorb impact—then return to their original shapes—may be used. Further, a variety or combination of energy management systems may be employed in the helmet **10** to meet the needs of a given application. For example, in a baseball helmet, a crushable foam designed to absorb a single, high-velocity impact may be used, whereas a recovering energy foam designed to absorb multiple, lower-velocity impacts may be used in a lacrosse helmet.

[0036] A lever **18**, dial, or similar locking device is attached to one of the rear shell portion **12** and the front shell portion **14**. In the illustrated embodiment, a lever **18** is attached to the rear region of the rear shell portion **12**. The lever **18** is movable between an unlocked position that allows the front and rear shells portions **14**, **12** to be pivoted relative to each other between an open position and a closed position, and a locked position that secures the front and rear shells portions **14**, **12** in a closed, use position. A torsion spring **17** or similar device may be attached to the lever **18** to bias the lever **18** toward the locked position.

[0037] The lever **18** optionally includes a cross-bar **19** or similar structure to which a cable **21**, cord, belt, or other connecting element is attached. The cable **21** runs from the lever **18** into the helmet through an opening in the rear shell portion **12**, and along each inner side of the helmet shell, optionally between the inner shell wall and an unaffixed portion of the internal, energy-attenuating material **11**. In one embodiment, the cable **21** may be stitched or otherwise attached to a first end of a belt **23** that is secured at its other end to a screw **25** or other anchor element projecting into the front shell portion **14**. Alternatively, the cable **21** may have a greater length and be attached directly to the screw **25** or other anchor element on the front shell portion **14**.

[0038] When the lever **18** is in the closed position, it pulls the cable **21** taut such that the front and rear shell portions **14**, **12** are held securely against each other in the closed, use position. When the lever **18** is moved into the unlocked position, the cable **21** loosens such that the front and rear shell portions **14**, **12** may be separated from each other into the open position to allow for efficient donning of the helmet **10**. Upper regions of the front and rear shell portions **14**, **12** may be configured to engage each other when the helmet is moved into the open position to limit the degree to which the helmet may be opened in the longitudinal direction.

[0039] Further, as best shown in FIG. **14**, the front and rear shell portions **14**, **12** optionally overlap and engage each other to form one or more lap joints so that the shell portions cannot move laterally relative to each other. Additionally or alternatively, the front and rear shell portions **14**, **12** may include corresponding tongues and grooves, or other cooperating engagements, to prevent the shell portions from moving laterally relative to each other. Accordingly, the overlapping shell structure absorbs the bulk of impact energy against the helmet **10**, and the lever **18** need only be capable of locking the shell portions **12**, **14** in place in the longitudinal direction.

[0040] In the open position, a channel **20** is formed on each inner side of the helmet **10**. These inner channels **20** provide a pathway for the wearer's ears during donning and removal of the helmet **10**. Thus, the wearer need not pull the sides of the helmet **10** laterally outward to move it past the wearer's ears. A recess **22** is provided on each interior side of the helmet to accommodate the wearer's ears in the closed, use position. Once the wearer's ears are located in the recesses **22**, the helmet **10** may be pivoted to the closed position and locked into place by moving the lever **18** to the closed position. Because the helmet **10** does not need to be stretched laterally, it can provide a snug, stable, comfortable fit over, below, and about the wearer's ears.

[0041] In one embodiment, the helmet **10** includes a chin cup **30** or chin guard connected to the helmet shell via upper straps **32** and lowers straps **34**. The straps **32**, **34** may optionally be routed to the chin cup **30** inside the helmet **10**, which improves stability and retention of the straps, as well as the aesthetic profile of the helmet **10**. In one embodiment, the straps **32**, **34** protrude to the exterior of the helmet **10** through openings **35** in the helmet shell.

[0042] Hinged cam levers **36** or similar securing devices are included near the openings **35** to secure the straps to the

helmet shell at desired lengths. The cam levers **36** are rotatable into an open position to allow for adjustment of the strap lengths, after which the cam levers **36** may be rotated into the closed position to grip the straps **32**, **34** and hold them in place. The cam levers **36** prevent or substantially prevent the straps **32**, **34** from moving or loosening such that the straps need not be adjusted once they are secured at desired lengths.

[0043] As shown in FIGS. **11**A-**11**D, in one embodiment, each cam lever **36** is pivotably connected to a grip member **38** that may be pulled into engagement with an inner surface of the strap **32** (or **34**) to secure the strap **32** in place. The grip member **38** optionally is in engagement with a base structure **37**. When the cam lever **36** is pivoted from the open position (shown in FIG. **11**A) to the closed position (shown in FIG. **11**B), an engagement portion **39** of the grip member **38** is pulled into the strap **32** to secure the strap in place.

[0044] In one embodiment, when the strap **32** is pulled or subjected to a load in direction X (shown in FIG. **11**C) while the cam lever **36** is in the locked position, the grip member pivots **38** about the cam lever **36**—and about a fulcrum point **41** on the base structure **37**—so that the engagement portion **39** further engages the strap **32** and more tightly secures it in place. In this manner, the cam mechanism is "self-energizing," meaning that as the load applied to the strap **32** increases, the gripping force applied by the gripping member **38** also increases. Further, the cam mechanism can resist equivalent loads even if the thickness of the strap **32** is varied.

[0045] The base structure **37** optionally includes openings **43** or a receiving mechanism positioned adjacent to the outer surface of the strap **32**. When an extreme load is applied to the strap in direction X (shown in FIG. **11**D), the grip member **39** pivots to an even greater degree about the cam lever **36** and the fulcrum point **41** to more tightly engage the strap **32** and to force portions of the strap **32** into one or more of the openings **43**. In this manner, the strap **32** is tightly secured, even under extreme loading conditions.

[0046] As shown in FIGS. **6** and **7**, compartments **40** or protruding arms or tabs **26** optionally are included in or on the helmet shell for receiving the free ends of the straps **32**, **34**. In the illustrated embodiment, compartments **40** are included in the upper region of the front shell portion **14** for receiving the ends of the upper straps **32**, and tabs **26** are included in the lower region of the front shell portion **14** for receiving the ends of the lower straps **34**. Any other arrangement of compartments **40** or tabs **26** may alternatively be used. The compartments **40** or tabs **26** shield the free ends of the straps from contact with sticks, helmets, gloves, and so forth. Concealing the ends of the straps **32**, **34** may also be aesthetically pleasing to many players.

[0047] The straps **32**, **34** optionally include sizing indicators **42**, such as printed numbers or raised bumps, to aid a user in adjusting the straps **32**, **34** to desired lengths. For example, if a user adjusts the straps to a first length, then tries on the helmet and determines the straps **32**, **34** need to be tightened or loosened, the sizing indicators **42** provide a guide for how much adjustment needs to be made. The sizing indicators **42** also provide an indication of whether the left and right straps are adjusted to the same length or to different lengths relative to each other.

[0048] Once desired strap adjustments are made by a user, the straps **32**, **34** remain securely in place and do not need to be adjusted or re-connected each time a wearer dons the helmet. There is no need to unclamp or unsecure the straps between uses due to the shell arrangement that allows for donning and removing of the helmet **10** by pivoting the front and rear shell portions **14**, **12** away from each other. This is particularly beneficial during a game, since a player will often be wearing bulky gloves that make it difficult to manipulate straps. With the hinged shell arrangement, only the lever **18** needs to be manipulated to allow for efficient removing and donning of the helmet **10**.

[0049] As shown in FIGS. **8** and **9**, a face guard **50** optionally is attached to inset side regions of the front shell portion **14**. The face guard **50** may be a cage, mask, or similar structure made from a metal, plastic, composite, or other suitable material. The front shell portion **14** includes an inset region **52** or channel on each of its sides for receiving a rearwardly extending section **54** of the face guard **50**. A cover **56** is positioned over each of the rearwardly extending sections **54** and is attached to the front shell portion **14** via bolts **55**, screws, or other suitable connecting devices. Such an arrangement facilitates efficient transfer of impact energy to the shell in a distributed loading pattern, as opposed to the point loading pattern that occurs in helmets in which the face guard is clipped to the helmet at multiple, discrete locations.

[0050] An upper section **57** of the face guard **50** may be secured in a channel or recess under the visor region of the helmet such that it is contained within the helmet's profile. Alternatively, the upper section **57** of the face guard **50** may be attached to the front shell portion **14** via a clip or other connecting device, or in any other suitable manner.

[0051] In one embodiment, the inset regions **52** may be lined with a cushioning element, such as an elastomeric adhesive or other cushioning material. Additionally or alternatively, the rearwardly extending section **54** of the face guard **50** may be coated or covered with a cushioning element. Providing such a cushioned interface between the face guard **50** and the helmet shell improves the damping characteristics of the helmet **10**.

[0052] The outer cover **56** may include an integral jaw protector **58**, or may be connected to a separate jaw protector, that extends along the bottom of the face guard **50** to cover the sides of a wearer's jaw and the front of a wearer's chin. The face guard **50** optionally may be attached to the jaw protector **58** via clips **59**, straps, or other connecting devices. The jaw protector **58** shields the wearer's jaw and chin from contact, and also provides a convenient structure for a wearer to grab onto and pull forward to move the helmet **10** into the open position when donning or removing the helmet.

[0053] As shown in FIGS. **15** and **13**A-**13**-C, the helmet **10** optionally includes an adjustment mechanism **60** at a crown region of the helmet **10** that provides for longitudinal adjustment between the front and rear shell portions **12**, **14**. The longitudinal adjustment mechanism **60** may be incorporated into the hinge structure or may be a separate element. In embodiments where ease of donning and removal is not required, a longitudinal adjustment mechanism **60** may be included while the hinge mechanism may be omitted.

[0054] In one embodiment, the adjustment mechanism **60** includes a spring-loaded or cantilevered arm **61** positioned on or integral with a band **63** or other support structure. The band **63** is directly or indirectly attached to or integral with an interior surface of one of the front and rear shell portions **14**, **12**. The arm **61** includes a button **62** or other activation element protruding to the exterior of the helmet shell from an end of the arm **61**. A receiving component **64** attached to or integral with the other of the front and rear shell portions **14**, **12** includes multiple openings **66** for receiving the button **62**

(three openings **66** are shown in the illustrated embodiment but any other desired number of openings **66** may be included).

[0055] In another embodiment, the spring-loaded arm **61** may include one or more upward-facing grooves for receiving one or more downward projections on the receiving component **64**, or may include one or more upward projections for engaging one or more downward-facing grooves on the receiving component **64**. Any other suitable engagement mechanism that allows for relative longitudinal movement between the front and rear shell portions **12**, **14** may be used.

[0056] When the button **62** is depressed, the front and rear shell portions **14**, **12** may be moved longitudinally relative to each other between the provided positions. The button **62** may be released when it is aligned with the opening **66** that provides the desired helmet length for a given wearer, such that it moves upward into the opening **66** and locks the front and rear shell portions in place. Three alternate longitudinal positions are shown by way of example in the illustrated embodiment. Such an adjustment allows for a personalized, snug fit against a wearer's brow. Thus, a wearer may adjust the fit of the helmet against his or her brow, and may leave the helmet in the desired fit position between uses.

[0057] The helmet **10** optionally includes an internal fit system, as well. Examples of such a fit system are described in U.S. patent application Ser. No. 12/191,000, filed on Aug. 13, 2008, which is incorporated herein by reference. In one embodiment, the helmet **10** includes a lateral and occipital adjustment system configured to engage the sides and back of a wearer's head and the nape of the wearer's neck. The lateral and occipital adjustment system may include one or more bands **72** (shown in FIG. **4**) or straps attached or affixed to the energy-attenuating material **11** (or to the front shell portion **14**) in the front interior region of the helmet **10**, via screws, snaps, or any other suitable connectors. The bands may be made of a relatively flexible plastic, nylon, or other suitable material.

[0058] The bands **72** may be tightened or loosened, such that they are displaced laterally toward or away from the central interior of the helmet **10**, via a dial **74**, knob, or another device located at the rear interior of the helmet **10**. An occipital pad **76** or similar element may be attached to the dial **74**, the bands **72**, or another region for engaging the rear of a wearer's head or the nape of the wearer's neck. Any other suitable lateral and occipital adjustment system may alternatively be used in the helmet **10**.

[0059] To don the helmet **10**, a user moves the lever **18** to the open position then positions the rear padding of the helmet against the rear of the user's head. The user then pulls the face guard **50** or jaw protector **58** forward to pivot the front shell portion **14** away from the rear shell portion **12** into the open position. The user then pulls the face guard **50** or jaw protector **58** in a downward direction such that the channels **20** move past his or her ears until the ears are positioned in the recesses **22**. The front shell portion **14** is then moved into the closed position, either automatically or with the aid of the user.

[0060] The chin cup **30**, assuming the straps **32**, **34** have been properly adjusted, engages the user's chin in the closed position. The user then moves the lever **18** into the locked position, which tightens the cables **21** or other connecting elements, thus securing the front shell portion **14** to the rear shell portion **12**. To remove the helmet **10**, the user simply moves the lever **18** to the open position, pulls the face guard **50** or jaw protector **58** forward, then lifts the helmet off of his or her head.

[0061] Any of the above-described embodiments may be used alone or in combination with one another. Further, the sports helmet may include additional features not described herein. While several embodiments have been shown and described, various changes and substitutions may of course be made, without departing from the spirit and scope of the invention. The invention, therefore, should not be limited, except by the following claims and their equivalents.

What is claimed is:

1. A sports helmet, comprising:

a shell including a first portion pivotably connected to a second portion;

a locking element on an exterior of the second portion movable between a closed position and an open position;

a connecting element attached to the locking element and to the first portion of the shell;

wherein when the locking element is in the closed position it holds the connecting element taut such that the first portion is in secure engagement with the second portion, and when the locking element is in the open position the connecting element is loose such that a lower region of the first portion may be moved away from a lower region of the second portion.

2. The sports helmet of claim **1** wherein the first portion and the second portion are in overlapping engagement with each other such that they are movable only in a longitudinal direction relative to each other.

3. The sports helmet of claim **1** wherein the locking element comprises a lever pivotably attached to the second portion of the shell, and further comprising a biasing element forcing the lever toward the closed position.

4. The sports helmet of claim **1** wherein the locking element comprises a dial attached to the second portion of the shell.

5. The sports helmet of claim **1** wherein the connecting element comprises a cable that passes from outside the second portion to inside the second portion.

6. The sports helmet of claim **5** wherein the connecting element further comprises a belt attached to the cable, wherein the belt is attached to an anchor element on an interior of the first portion of the shell.

7. The sports helmet of claim **1** further comprising energy-attenuating material, a portion of which is affixed to an inner surface of the shell.

8. The sports helmet of claim **7** wherein the connecting element is positioned between an unaffixed portion of the energy-attenuating material and the inner surface of the shell.

9. The sports helmet of claim **1** further comprising a chin cup assembly including a plurality of adjustment straps, wherein each adjustment strap is releasably secured to the first portion of the shell via a cam lever.

10. The sports helmet of claim **9** further comprising at least one compartment or tab in or on an exterior of the first portion of the shell positioned near a free end of one of the straps for receiving the free end of the strap.

11. The sports helmet of claim **1** further comprising an adjustment mechanism that provides longitudinal adjustment between the first and second portions of the shell, the adjustment mechanism comprising:

a spring-loaded arm directly or indirectly attached to or integral with an interior surface of one of the first and

second shell portions, the spring-loaded arm including an activation element protruding to the exterior of the helmet shell; and

a receiving component attached to or integral with the other of the first and second shell portions, the receiving component including a plurality of longitudinally spaced openings for receiving the activation element.

12. The sports helmet of claim **1** further comprising a lateral and occipital adjustment mechanism attached to an interior surface of the shell.

13. A sports helmet, comprising:

a shell including a plurality of strap openings;

a chin cup assembly including a plurality of adjustment straps that pass along an interior of the shell and out through the strap openings;

a cam mechanism attached to an exterior of the shell near at least one of the strap openings, the cam mechanism movable between an open position and a locked position in which it engages one of the straps and secures it in place.

14. The sports helmet of claim **13** wherein the chin cup assembly includes four straps, each of which passes through one of the strap openings, and wherein a cam mechanism is attached to an exterior of the shell near each of the strap openings for engaging one of the straps.

15. The sports helmet of claim **13** further comprising at least one compartment in an exterior of the shell positioned near a free end of one of the straps for receiving the free end of the strap.

16. The sports helmet of claim **13** wherein the cam mechanism comprises:

a grip member; and

a lever pivotably attached to the grip member and movable between the open position and the locked position;

wherein, when in the locked position, the grip member is pivotable to increasingly engage the strap when the strap is subjected to a tightening load.

17. The sports helmet of claim **16** wherein the cam mechanism further comprises a base structure in engagement with the grip member, wherein the grip member further pivots about a fulcrum point on the base structure when the strap is subjected to a tightening load.

18. The sports helmet of claim **17** wherein the base structure comprises at least one opening for receiving a portion of the strap engaged by the grip member when the strap is subjected to an extreme tightening load.

19. A sports helmet, comprising:

a shell including a first side and a second side;

an inset region in each of the first and second sides;

a face guard including attachment portions attached to the inset regions; and

a cover positioned over each of the attachment portions and attached to the shell.

20. The sports helmet of claim **19** further comprising a cushioning element covering at least one of the inset regions and the attachment portions.

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