Nov. 8, 1966 R. F. CRITSER 3,283,336

SAFETY DEVICE IN COMBINATION WITH A FOOTBALL HELMET

Filed May 6, 1964 2 Sheets-Sheet 1

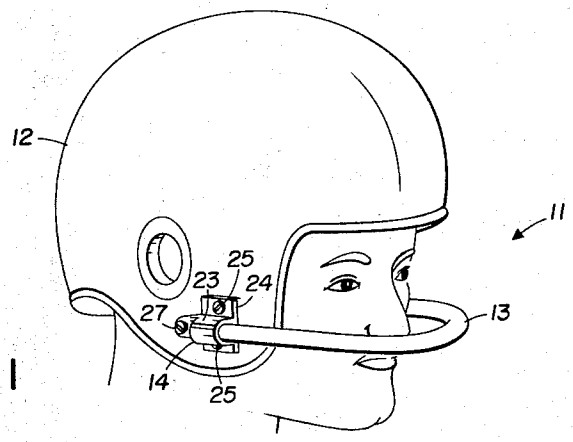


FIG 1

FIG 2

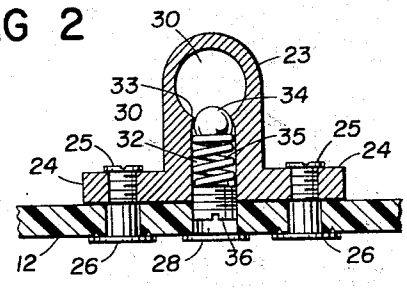
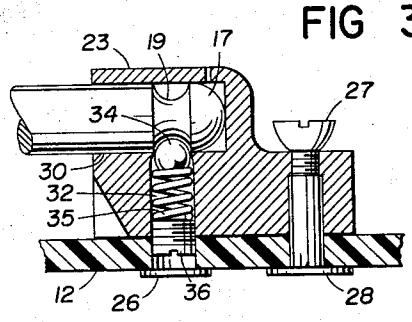


FIG 3



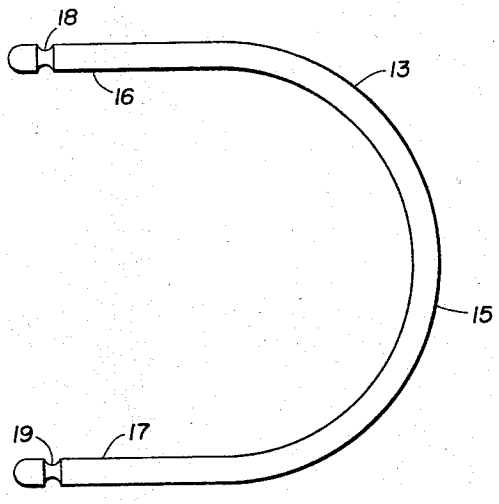


FIG 4

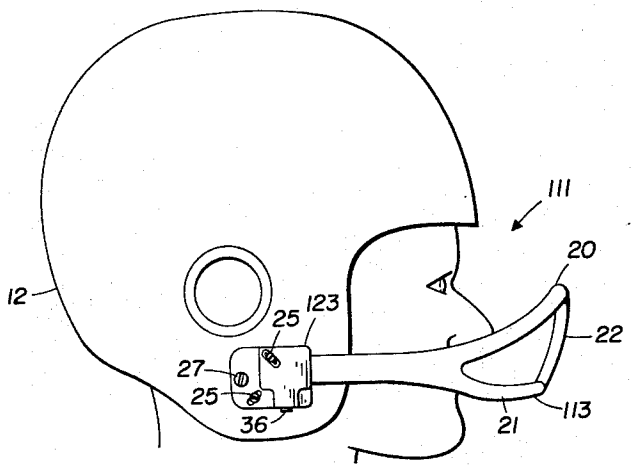
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SAFETY DEVICE IN COMBINATION WITH A FOOTBALL HELMET

Filed May 6, 1964 2 Sheets-Sheet 2

FIG 5



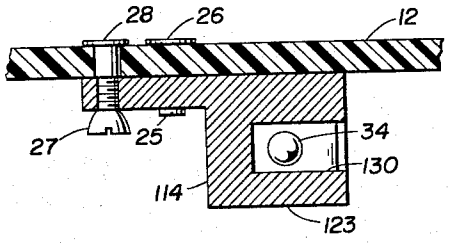


FIG 6

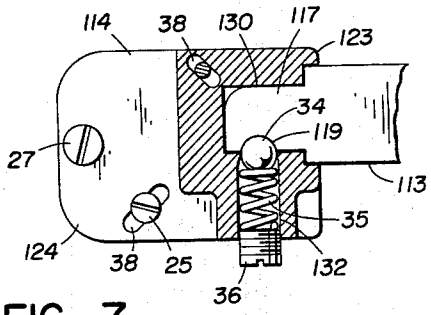


FIG 7

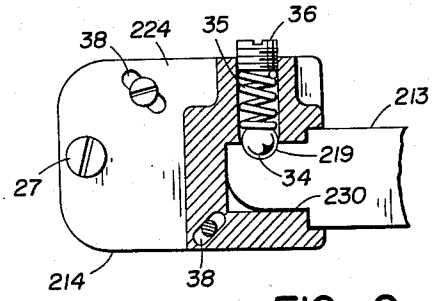


FIG 9

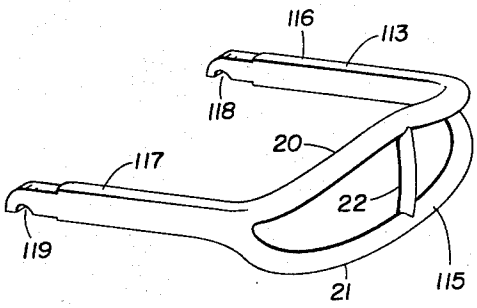


FIG 8

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SAFETY DEVICE IN COMBINATION WITH A FOOTBALL HELMET

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12 Claims. (Cl. 2—9)

This invention relates to a safety helmet device and more particularly to a safety face guard for a football helmet.

One of the better football equipment improvements made during the last few years has been the addition of a face guard to the helmet worn by each player. Such a face guard is commonly mounted at opposite sides of the helmet and extends across the frontal opening in the helmet to prevent objects from reaching the face of the wearer, as is well known in the art.

While the addition of the face guard to the helmet has proven to be of value in protecting the face of a wearer from injury, the conventional face guard has also provided a new means for causing other serious injuries to the wearer, primarily neck and back injuries, since the face guard must, of necessity, be positioned where an opponent can easily grasp the face guard in attempting to tackle or otherwise stop the helmet wearer. While this has been recognized and attempts have been made to discourage this practice, these attempts have fallen far short of complete success.

It is readily apparent that the injury problem thus brought on by use of the face guard can be eliminated only if the face guard itself is eliminated or a way is found to eliminate the hazards associated with the use of the face guard. Since the face guard does serve a needed function, elimination of the hazard is obviously the preferred solution and this invention is directed to that end.

Since the type of injury involved is most often caused by an opponent grasping the face guard, it has been found that the hazard can be eliminated, or at least substantially reduced, by providing a face guard that can be readily detached from the helmet when an opponent grasps the face guard and force is thereafter exerted in a direction tending to separate the face guard from the helmet. While some devices have been proposed for making the face guard detachable, these devices have either proven unsuccessful or have caused new problems that make the resulting structure unacceptable for its intended use. A detachable face guard of the latter type is shown, for example, in United States Patent Number 2,986,739, wherein exposed forwardly projecting spring clips are shown for releasably holding the face guard in position.

It is therefore an object of this invention to provide an improved safety device for a helmet that is dependable in preventing injury and is safe for general use.

It is another object of this invention to provide a safety device for a helmet having means that permits a face guard to be readily detached from the helmet whenever at least a predetermined force is exerted tending to separate the face guard from the helmet.

It is yet another object of this invention to provide a safety device that includes a face guard the ends of which are inserted into sockets in mounting brackets and are retained therein until at least a predetermined force is exerted on the face guard in a direction tending to pull the end portions out of said sockets.

It is still another object of this invention to provide a safety device that includes a detachable face guard mounted on a helmet by means of mounting brackets, said brackets having mounted therein adjustment means for controlling the amount of force necessary to detach said face guard.

With these and other objects in view which will become apparent to one skilled in the art as the description proceeds, this invention resides in the novel construction, combination and arrangement of parts substantially as hereinafter described and more particularly defined by the appended claims, it being understood that such changes in the precise embodiments of the herein disclosed invention may be included as come within the scope of the claims.

The accompanying drawings illustrate three complete examples of the embodiments of the invention constructed according to the best modes so far devised for the practical application of the principles thereof, and in which:

FIGURE 1 is the perspective view showing one embodiment of the safety device of this invention mounted on a conventional football helmet;

FIGURE 2 is a front sectional view showing one of the mounting brackets of the safety device of this invention as shown in FIGURE 1;

FIGURE 3 is a side sectional view of the mounting bracket of the safety device of this invention as shown in FIGURE 1;

FIGURE 4 is a top view of the face guard of the safety device as shown in FIGURE 1;

FIGURE 5 is a side view showing a second and preferred embodiment of the safety device of this invention mounted on a conventional football helmet;

FIGURE 6 is a top sectional view of the mounting bracket of the safety device of this invention as shown in FIGURE 5;

FIGURE 7 is a side sectional view of the mounting bracket of the safety device of this invention as shown in FIGURE 5;

FIGURE 8 is a perspective view of the face guard of the safety device as shown in FIGURE 5; and

FIGURE 9 is a side sectional view of a third embodiment of the safety device of this invention.

Referring now to the drawings in which like numerals have been used for like characters throughout, safety device **11** is shown in FIGURE 1 mounted to a conventional football helmet **12**. Safety device **11** includes a face guard **13** and a pair of mounting brackets **14** only one of which can be seen in the drawings. Brackets **14** may be identical in structure and hence only one is described in detail herein.

Face guard **13** may, as shown best in FIGURE 4, be made of round bar stock bent in a substantially U-shape, the central portion **15** of which protects the face when mounted on a football helmet in the manner shown in FIGURE 1 with the end portions **16** and **17** inserted into brackets **14**. End portions **16** and **17** have a pair of annular grooves **18** and **19** spaced slightly from the rounded ends for purposes to be brought out more fully hereinafter.

While the face guard shown in the embodiment of the invention shown in FIGURES 1–4 is made of round bar stock the invention is not meant to be limited thereto. The face guard could, for example, be made of stock of rectangular cross section, as is a portion of face guard **113** shown in FIGURES 5–8. As shown best in FIGURE 8, face guard **113** has end portions **116** and **117** of rectangular cross section, and a central portion **115** composed of a pair of spaced bars **20** and **21** joined at the middle of each by a vertical supporting rod **22**. As also shown in FIGURE 8, end portions **116** and **117** may be of slightly reduced cross sectional area near the ends, and have notches **118** and **119** cut in the bottom thereof. If desired, the ends may be upwardly rounded, as also shown in FIGURE 8.

As illustrated in the embodiment of the invention shown in FIGURE 9, notches **218** and **219** (only **219**

being shown) can be cut equally well in the top of the end portions of face guard **213** without departing from the intended scope of the invention.

It is a feature of this invention that the face guard is readily detached from the helmet upon the application of force to the face guard in a direction forwardly and away from the helmet. To accomplish this, face guard **13**, as shown in FIGURE 1, is releasably fastened to the football helmet by means of mounting brackets **14**. Each mounting bracet has a body portion **23** with mounting flanges **24** extending therefrom, said body portion being of reduced area at the rear, as shown best in FIGURE 3, for purposes to be brought out more fully hereinafter. Each flange **24** has a hole therein and each bracket is fastened to the helmet by means of screw **25** (passing through the hole in the flange) and lock nut **26**, as shown best in FIGURE 2. A third screw **27** and nut **28**, the former passing through a hole in the reduced rear section of the mounting bracket (as shown in FIGURE 3) completes the bracket fastening arrangement. Screw **27** is upwardly curved as shown in FIGURE 3 to receive a conventional football helmet chin strap.

Body portion **23** of each bracket **14** has a forwardly opening socket **30** therein, which socket may be circular in cross section, as shown in FIGURE 2, to receive a face guard of round bar stock, as shown in FIGURE 4, the area of the cross section of the socket being slightly larger than that of the cross sectional area of the end portions **16** and **17** of face guard **13** so that end portions **16** and **17** may be received in said sockets. As shown in FIGURE 1, mounting bracket **14** is mounted on the football helmet so that socket **30** in each bracket **14** is substantially horizontally positioned and opens forwardly so that, when the end portions of the face guard are inserted into the brackets, the central portion **15** of the face guard **13** protects the face of the wearer.

A bore **32** is cut in body portion **23** of each bracket **14** substantially normal to socket **30** and communicating therewith, bore **32** being of smaller diameter, however, than socket **30**, as shown best in FIGURE 2. Bore **32** has a reduced diameter opening, or lip, **33** at the end opening into socket **30** to retain a ball bearing **34** (of slightly smaller diameter than bore **32** but larger than the restricted opening **33**) within the bore but permitting a portion of the ball bearing to project into socket **30**, as shown in FIGURES 2 and 3. While a bore receiving a ball bearing is shown and described herein, this invention is not meant to be limited thereto. A bar of any convenient across section comparable to that of the passage opening into the socket may be utilized, for example, the end projecting into the socket being rounded or tapered or the like, of course, so that the bar can be cammed inwardly as the face guard is inserted into the sockets.

Ball bearing **34** is constantly urged toward socket **30** by means of a spring **35** located in bore **32** behind ball bearing **34**. The tension on spring **35** is adjusted by means of a set screw **36** threadably received in the free end of the bore and in contact with the spring at the end opposite that of ball bearing **34**, as shown best in FIGURES 2 and 3 (as shown, a hole is cut into helmet **12** for access to set screw **36**).

As shown best in FIGURE 3, ball bearing **34** snaps into the annular grooves **18** and **19** of face guard **13** when the end portions are inserted into socket **30**. As brought out more fully hereinafter, the face guard is thus retained in position until a force is exerted on the face guard in a direction pulling the face guard from the sockets with sufficient force to overcome the spring tension on the ball bearings. When this occurs, the face guard is detached from the helmet. The spring force exerted on ball bearing **34** by spring **35** may be adjustably controlled by set screw **36** so that the force necessary to detach the face guard from the helmet may be adjusted as desired.

If the face guard has a different cross section than that of the face guard of round stock, the sockets in the mounting brackets must be altered accordingly. If the face guard has end portions of rectangular cross section, as shown in FIGURES 5–8, then socket **130** of the mounting brackets must likewise be of rectangular cross section, the cross sections of course being slightly larger than that of the end portions of the face guard so that the end portions may be received therein. As shown in FIGURES 6 and 7, mounting brackets **114** of safety device **111** have a body portion **123** with a rearwardly extending flange **124**, the mounting brackets being fastened to helmet **12** by means of screws **25** and lock nuts **26**. As shown in FIGURES 5, 6, and 7, screw **27**, also utilized for the chin strap, and lock nut **28** fasten the flange itself to the helmet in the embodiment of the invention. As shown in FIGURE 7, mounting brackets **114** have slots **38** therein through which screws **25** pass, thus permitting the face guard to be adjusted in a vertical plane.

Bore **132** is cut into body portion **123** of brackets **114** so as to be normal to socket **130** and communicate therewith in the same manner as does the bore in mounting bracket **14**. Bore **132** is cut into the bottom of the mounting bracket, however, as shown in FIGURE 7, so that ball bearing **34** protrudes upwardly into the socket under the urge of spring **35** tensioned by set screw **36**.

If desired, the bore can be cut downwardly from the top of each bracket, rather than upwardly from the bottom, as shown in FIGURE 9, so that ball bearing **34** will then protrude downwardly into socket **230** of brackets **214** under tension of spring **35** adjusted by set screw **36**. This type of socket can be used, however, only if notches **218** and **219** are cut into the top of the end portions of the face guard rather than at the bottom as shown for face guard **113** (FIGURE 8).

As is evident from the foregoing, a pair of brackets are utilized for each face guard to receive the opposite ends of the face guard and thus position the central portion across the frontal opening of the helmet. Brackets **14** may be identical since annular grooves are cut in the end portions of the face guard and the ball bearing protrudes outwardly from the helmet into the forwardly opening socket in each bracket. Although not specifically shown, it is to be understood that the pair of brackets **114** are reversed with respect to each other so that when mounted on the helmet, each bracket has a forwardly opening socket in which the ball bearing is located at the bottom of the socket. In like manner, brackets **214**, when mounted on a football helmet, have forwardly opening sockets in which the ball bearing is located at the top of the socket. It is to be noted that brackets **114** and **214** have the added advantage of being externally adjustable quickly and without need for helmet removal.

In operation, the face guard is inserted into the sockets by a rearwardly motion toward the front of the helmet so that the end portions are received in the sockets of the mounting brackets. When the end portions are substantially fully inserted into the sockets (with the ends contiguous to the back edge of the brackets), as shown in FIGURES 3, 7, and 9, ball bearings **34** (which have been forced back into the bore as the end portions pass into the socket) snap into the annular groove (embodiment shown in FIGURES 1–4) or notch (embodiments shown in FIGURES 5–9) in each end portion to thereafter hold the face guard in place.

During normal usage, the face guard is thus retained in place and the face of the wearer is protected. If a force should be applied rearwardly, the face guard will be firmly held in position by the mounting brackets and the face of the helmet wearer will thus be protected from injury. If, however, an opponent should grasp the central portion of the face guard and pull forwardly away

from the front of the helmet (or if the wearer should try to pull away), the face guard will be readily detached from the mounting brackets and helmet and thus prevent injury to the helmet wearer.

The force necessary to detach the face guard depends upon the amount of spring tension on the ball bearing. It is a feature of this invention that this spring tension is made adjustable by means of set screw **36** so that the amount of force necessary to detach the face guard may be controlled as needed for each particular circumstance.

In view of the foregoing it should be evident to those skilled in the art that the device of this invention provides a heretofore unavailable safety means for protecting a helmet wearer from injury by eliminating a prime source of danger.

What is claimed as my invention is:

1. A safety device in combination with a helmet having opposite depending side portions and a frontal opening exposing the face of the wearer, said safety device comprising: a face protection member having a pair of end portions; a pair of mounting members each of which is attached to a different one of said depending side portions of said helmet, each said mounting member having a forwardly opening hollow portion forming a socket therein the cross section of which is of substantially the same configuration but slightly larger than that of the end portions of said face protection member so that said end portions may be received in said sockets; and means releasably retaining said end portions in said sockets but permitting said face protection member to be readily detached from said mounting members whenever at least a predetermined force is exerted on said face protection member in a substantially forwardly direction, said means including projection means mounted in one of said members and an indentation in the other of said members, said projecting means registering with said indentation at a point within said sockets when said end portions are substantially fully inserted into said sockets.

2. The safety device of claim **1** wherein said projecting means includes a spring loaded ball bearing.

3. The safety device of claim **1** wherein said projecting means is mounted in each said mounting member so as to project into said sockets, and wherein said end portions inserted into said sockets have said indentations thereon.

4. A safety device in combination with a helmet having opposite depending side portions and a frontal opening exposing the face of a wearer, said safety device comprising: a substantially U-shaped face protection member the end portions of which have an indentation therein; a pair of mounting members each of which is attached to a different one of said depending side portions of said helmet, each said mounting member having a forwardly opening socket therein the cross section of which is of substantially the same configuration but slightly larger than that of the end portions of said face protection member so that said portions may be received in said socket; a pair of springs each of which is mounted in a different one of said mounting members; and a pair of ball bearings each of said ball bearings being mounted in a different one of said mounting members adjacent to one of said springs so that said springs bias said ball bearings toward and partially into said sockets so that said ball bearings engage the end portions of said face protection member inserted into said sockets, said ball bearings registering with said indentations in said end portions to thereby releasably retain said end portions in said sockets but permitting said face protection member to be readily detached from said mounting members whenever a force is exerted on said face protection member in a substantially forwardly direction sufficient to overcome the spring force exerted on said ball bearings.

5. The safety device of claim **4** further characterized by adjustment means engaging each said spring for adjusting the force exerted by said springs on said ball bearings to thereby adjustably control the amount of force necessary to detach said face protection member from said mounting members.

6. The safety device of claim **4** wherein said socket in said end portions are of circular cross section and wherein said end portions have an annular groove therein.

7. The safety device of claim **4** wherein said socket in said end portions are of rectangular cross section, wherein said end portions have a notch cut into the bottom thereof, and wherein said ball bearings are biased upwardly and project into the bottom of each said socket.

8. The safety device of claim **4** wherein said socket in said end portions are of rectangular cross section, wherein said end portions have a notch cut into the top thereof, and wherein said ball bearings are biased downwardly and project into the top of each said socket.

9. A safety device in combination with a helmet having opposite depending side portions and a frontal opening exposing the face of a wearer, said safety device comprising: a substantially U-shaped face protection member the end portions of which have an indentation therein; a pair of mounting members each of which is attached to a different one of said depending side portions of said helmet, each said mounting member having a forwardly opening socket therein the cross section of which is of substantially the same configuration but slightly larger than that of the end portions of said face protection member so that said end portions may be received in said sockets, and each said mounting member also having a bore therein substantially normal to and opening into said socket, each said bore having a portion adjacent to said socket of smaller diameter than the remainder of said bore; a pair of springs each of which is in a different one of said bores in said mounting members; a pair of ball bearings each of which is confined in a different one of the said bores between said spring and said portion adjacent to said socket, each of said ball bearings being biased by said spring toward and slightly into said socket so that said ball bearings register with said indentations in said end portions of said face protection member to normally retain said face protection member in place while permitting ready detachment whenever said face protection member is subjected to a substantially forwardly directed force sufficient to overcome that exerted by said springs on said ball bearings; and a pair of adjustment screws in said mounting means each of which engages a different one of said springs to adjustably control the force each said spring exerts on said ball bearing whereby the force necessary to detach said face protection member from said mounting members may be varied as needed.

10. A safety device in combination with a helmet having opposite depending side portions and a frontal opening exposing the face of a wearer, the combination with said helmet of a mounting bracket comprising: a body portion having a forwardly opening socket therein and a bore communicating with said socket; a ball bearing in said bore; and a spring biasing said ball bearing toward said socket.

11. A safety device in combination with a helmet having opposite depending side portions and a frontal opening exposing the face of a wearer, the combination with said helmet of a mounting bracket comprising: a body portion having a forwardly opening socket therein and a bore communicating with said socket; a ball bearing in said bore; a spring for biasing said ball bearing toward said socket; and a set screw in said bore at the side of said spring opposite that of said ball bearing, the position of said set screw determining the spring force on said ball bearing.

12. A safety device in combination with a helmet having opposite depending side portions and a frontal opening exposing the face of a wearer, the combination with said helmet of a mounting bracket for receiving

the notched end portions of a face guard, said mounting bracket comprising: a body portion having a forwardly opening socket therein of the same configuration but slightly larger in cross section than the end portions of a face guard to be received therein; a bore in said body portion substantially normal to said socket, said bore communicating with said socket and having a restricted opening thereinto; a ball bearing in said bore, said ball bearing being retained in said bore by said restricted opening; a spring in said bore biasing said ball bearing toward said restricted opening so that a portion of said ball bearing normally protrudes into said socket and registers with the notch in the end portion of a face guard inserted into said socket; a set screw for adjusting the force said spring exerts on said ball bearing; and means fastening said mounting bracket to said helmet so that a face guard normally protects the face of a helmet wearer from injury.

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